Community Redevelopment Agency of the City of Los Angeles

Feasibility Study for the Resurrection of the Red Car Trolley Services in the Los Angeles Downtown Area

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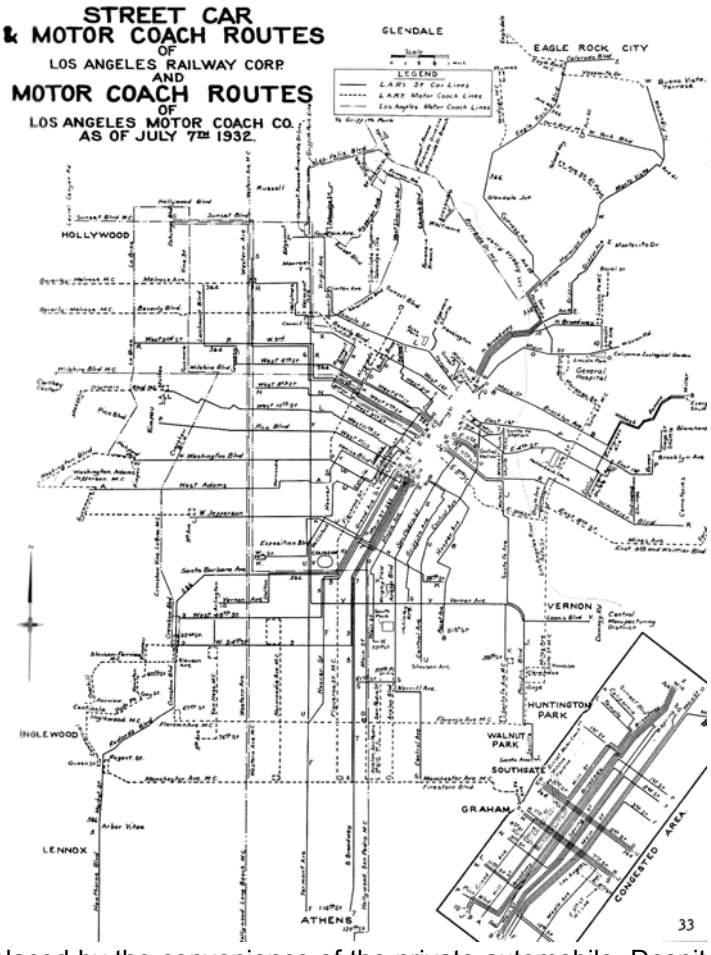
STUDY SUMMARY

The Community Redevelopment Agency of the City of Los Angeles (CRA/LA) is studying the feasibility of bringing back the Los Angeles streetcar services as part of the overall redevelopment strategy for the downtown area. This report summarizes the analyses conducted on various alignment concepts and the outreach efforts involved in determining the feasibility of resurrecting the historic downtown Los Angeles streetcar. Adhering to the vision, purpose, and need developed for this project, the concepts developed looked at providing the most efficient circulator services for residents and tourists within the core downtown area. In addition, estimated ridership and costs were calculated for each of the alignments to help in providing a comparative analysis, which will help in eventually narrowing down a preferred alternative.

WHAT DID THE STREETCAR DO FOR LOS ANGELES?

In order to help understand how the streetcar can fit into a modern downtown Los Angeles, it is important to understand the earlier role of the streetcar.

The Los Angeles Railway (LARY) was once one of the largest and most heavily used rail transit networks in the world. The system operated for 90 years and covered roughly 600 miles of track using over 1,200 cars at its peak, with the streetcar system having a higher rate of public transit usage per capita than San Francisco does today.



The Los Angeles streetcar system was by far the largest streetcar system ever constructed, and was instrumental in shaping the early development pattern of Los Angeles. For years, the system was considered by many to be "the vital cog in the city's transportation system", providing transportation for millions who, according to author Steven Ealson[1], enjoyed the streetcar so much they would "ride for miles simply for fun or for transportation to places of amusement".

The demise of the streetcar began as single-family tract housing and the rise of automobile travel began to dominate the Los Angeles landscape. Streetcar systems depend upon the concentration of population for a good turnover. Unable to keep up with the rapid sprawl of development that began to occur after World War II, the streetcars were quickly replaced by the convenience of the private automobile. Despite the continued relative success of the downtown streetcar lines, a diesel bus trend was accelerated as an economic move and the streetcar system was abandoned on March 31, 1963, after 90 years of service.

[1] *The Los Angeles Railway Through the Years, Steven L. Ealson, 1973.*

WHERE IS THE PUSH FOR RESURRECTING THE STREETCAR COMING FROM?

The push to resurrect a downtown streetcar service began in October 1997, when a concept emerged to reintroduce the Los Angeles historic streetcars as a vintage trolley to link together the various elements of downtown Los Angeles. The general concept was to create a tourist attraction of historical significance which would also provide an additional means of transportation much like the cable cars and the Market Street Railway in San Francisco. The concept was envisioned as a way to help reinvigorate, connect, and promote downtown by unifying otherwise disparate business, cultural, and entertainment communities.

This idea seemed to fit perfectly with the renaissance in rail transit occurring in Los Angeles that has included the opening of the Metro Blue Line in 1990, the Metro Red Line in 1993, the Metro Green Line in 1995, the resurrection of the Pacific Electric Red Car Trolley at the Port of Los Angeles in 2003, the Metro Gold Line in 2004, and the anticipated opening of the Metro Gold Line Extension to East Los Angeles and the design of the Exposition Line to West Los Angeles. In addition, the continual growth in traffic congestion is spawning new ideas for designing and implementing alternative modes of transportation.

The resurrection of the Los Angeles streetcar is being seen as the next step in this rail transit revival, not only because it can provide an alternative mode of transportation, but because of its community focus. It has the ability to be an economic redevelopment catalyst and help in bringing back the downtown life that once existed when the previous Los Angeles Railway system was still in operation. As a result, there is strong community and regional support for the re-introduction of streetcar service in downtown Los Angeles.

Among those considering the revival of a Los Angeles streetcar system are local, state, and federal elected officials, the local business improvement districts (BIDs), neighborhood councils, community residents, the local and regional transportation agencies, the Central Cities Association, the Los Angeles Conservancy, and of course the Community Redevelopment Agency are all participating in the process to revive the Los Angeles streetcar.

WHAT IS THE PURPOSE FOR THE STREETCAR?

ROLES OF THE STREETCAR

Historically, the streetcar was seen as a mode of transportation providing service to those that either did not have a private vehicle or elected not to use one. They provided a reliable and fixed route mode of transportation that was cheap and easy to use to get from one place to another locally, or provided access to more regional modes of transportation in order to travel to or from regional destinations.

Streetcars are typically found in dense urban centers because they need a pedestrian oriented environment to operate successfully. Streetcars are different from traditional light rail transit (LRT) vehicles we see today, such as Metro's Blue, Green, and Gold Lines, because they do not typically have their own rights-of-way and usually operate in-street with private vehicles. Stations are usually simple and minimal in design, resembling bus stops more than rail stations. Station stops are usually provided every block or two (depending on block sizes), where traditional LRT services provide stops every 1 or 2 miles.

Streetcars are intended to be more local and blend into the community character. As a result, streetcars have become one method used in several cities across the United States for encouraging economic redevelopment and tourism within struggling urban centers. Examples include the Market Street Railway in San Francisco, the Portland Streetcar, and Canal Street in New Orleans, the TECO Line in Tampa, and the M-Line in Dallas.

WHAT HAS THE STREETCAR DONE FOR OTHER CITIES?

The revival of streetcar services in these cities has helped the economic revival of their downtown areas, especially as it relates to tourism. For San Francisco and New Orleans in particular, the streetcar provides convenient access to, through, and from some of the biggest tourist destinations in the downtown areas. The Market Street Railway in San Francisco provides access to Fisherman's Wharf, Ghirardelli Square, the Cable Cars, harbor cruises, museums, and parks. The Canal Street trolley in New Orleans provides access for visitors to the French Quarter, downtown, Mid-City, Riverfront, and the city parks.

While streetcar is popular with tourists, its positive impact as a downtown revitalization tool can also be seen at many places. In Portland, businesses along the trolley line in the downtown have recorded increasing sales and high patronage every time the streetcar makes a stop. As part of the City's Growth Management Strategy, the Portland Streetcar project was envisioned as a key downtown transit link connecting major venues in downtown. With 81% weekday ridership increase from summer 2001 to fall 2005, the streetcar project is considered a success in bringing economic development to the downtown core of Portland.

The McKinney Avenue Line, which is the streetcar service in Dallas downtown began in 1989 and according to the American Public Transportation Association (APTA), this service has brought cohesiveness to the Downtown district by increasing patrons to restaurants and shops. The merchants in downtown consider the service as an "important adjunct to the area", that is a major entertainment center. Dallas streetcar is also an integral part of the Dallas Area Rapid Transit (DART) system that connects local community with various destinations in the city.

The TECO Line streetcar system in Tampa is a 2.4 mile line that connects downtown with Channelside and Ybor City. The 2005 annual report of the streetcar system that is jointly owned by City of Tampa and Hillsborough Area Regional Authority (HART), records an average daily ridership of 1,194 and according to the Tampa Downtown Partnership, more than $800 million in new privately funded construction projects have been completed or approved within two blocks of the streetcar line since inception. A 1/3 mile extension is being planned to connect people in the downtown area to every major downtown parking structure.

An interesting aspect of streetcar operations in these cities is the integration of the streetcar into the regional transportation system. Though they were designed to cater to the visitors of the area, they also have again found a niche in the everyday commutes and travel patterns of residents and commuters, further increasing their versatility and attractiveness.

The benefits of streetcars in other cities in the United States are similar. The streetcars have inspired and promoted economic revival, they have encouraged and attracted tourism, and they have supplemented the existing, everyday public transit services already in operation.

WHAT CAN A STREETCAR DO FOR LOS ANGELES?

Streetcars have been successful in other cities in the United States; but what can they do for Los Angeles? This is one of the driving questions behind the pursuit of resurrecting the streetcar in the downtown area. It is easier however to approach this by breaking it down into two questions; 1) what will it bring to the downtown communities? and 2) who will it benefit?

WHAT WILL IT BRING TO THE DOWNTOWN COMMUNITIES?

Like other cities, a resurrected streetcar in downtown Los Angeles has the potential to help in the revitalization and redevelopment of the downtown area. Downtown Los Angeles is in the process of an economic revival, with shops, businesses, and residences migrating back into the downtown core. Arguably the heart of this revitalization is the Broadway Historic Core, which boasts the greatest density of retail and residential development in the central business district. Other examples of this "reawakening" are occurring in the Fashion District, South Park, and Bunker Hill areas. Of particular significance is the re-emergence of downtown as a residential area, often through the conversion of former offices in addition to new residential construction. The resurrection of the streetcar can support the redevelopment concept by providing convenient access between these new residential neighborhoods and nearby employment and commercial areas.

The re-introduction of a streetcar system in the heart of downtown Los Angeles can also encourage, inspire, and attract further redevelopment of the downtown. It represents a concerted effort in creating fixed investments for the downtown communities, which in turn can encourage additional investment. This can bring with it businesses, residents, events, attractions and visitors. A fixed investment like the downtown streetcar can attract visitors who normally would not travel through the downtown area in their visits to Los Angeles. Many of the visitors arrive for the purpose of attending conventions and never take the time to travel beyond their hotel or the convention center. A downtown streetcar is a welcoming sight that can encourage people to take a ride. While onboard they can travel to the historic, local, or regional locations they might not otherwise have seen.

Beyond the attraction of economic investment and the draw for tourists and visitors, a downtown streetcar can enhance the sense of pride downtown stakeholders, businesses and residents have; pride in the downtown that once was and the downtown that it is becoming.

WHO WILL IT BENEFIT?

Who the streetcar will benefit is equally as important as what it will bring to the community. Like most transportation services, public transit generally identifies and caters to specific markets. Usually the focus is on workplace, institutional or residential markets. The streetcar however can provide a benefit to every market. Though the emphasis may be on specific ones, a streetcar can provide benefits to travel markets such as:

- Workplace/Institutional
- Cultural/Recreational
- Residential
- Shopping/Retail
- Hotels/Tourism
- Convention Center/Events

To help facilitate public involvement in determining who can benefit the most from a resurrected streetcar system, downtown stakeholders were asked to participate in a Project Advisory Group. This group was presented with a matrix in which they were asked to rank their priorities for the markets that a revived streetcar service should focus on. Of the markets presented, an emphasis was made on retail, cultural, and recreational markets.

It should be noted that, just because the retail, cultural and recreational markets stood out, this does not mean that service to the remaining markets will be ignored. Through extensive public outreach that will be provided as the project progresses, ideas will develop to identify the best way to provide reliable and frequent service to these remaining markets, while still emphasizing the retail, cultural and recreational markets.

WHAT IS THE NEED FOR THE STREETCAR?

The importance that streetcars once had in downtown Los Angeles and other areas has been discussed. But why is a streetcar needed for downtown Los Angeles now?

With growing population and employment in the downtown area, there is movement back into downtown retail stores, activity and cultural centers and residential neighborhoods. The construction of new tourist and recreational centers such as L.A. Live and the Grand Avenue Projects; the expansion of existing venues such as the Los Angeles Convention Center; the increased traffic congestion and the high price of gas and parking are forcing residents, employees and visitors alike to look for an alternative means of transportation to get around downtown Los Angeles.

It is true that this service could easily be accommodated by new or modified bus services. However a streetcar generates an attraction not seen by traditional transit services. In addition, it represents a fixed route and fixed investment. People (both residents and visitors) will know where it goes and know it is there to stay.

In short, the need for the streetcar relates to three key factors; 1) it provides a necessary downtown circulator service for residents, employees, and visitors allowing easy, frequent and convenient travel around the downtown area, 2) it presents a tourist attraction that can bring people into the downtown core, and 3) it represents a fixed community investment that people can count on and that won't be going away.

Report Contents

The contents of this report are broken into eight major chapters:

- An introduction that provides a brief history of streetcar service in Los Angeles and summarizes the impetus for this effort
- A review of the purpose and need and transportation vision for the streetcar,
- An outline of the engineering design criteria established,
- A summary of community and stakeholder involvement,
- A discussion on the development of the alignment concepts, including estimated travel times, ridership potential and cost estimates,
- A summary of the criteria and concept evaluation,
- The identification of potential funding sources, for both capital and operating expenses, and
- Next steps in the project development process.

1.0 INTRODUCTION

The Community Redevelopment Agency of the City of Los Angeles (CRA/LA) is studying the feasibility of resurrecting streetcar services in the Los Angeles downtown area. This report summarizes the analyses conducted on various alignment concepts and the outreach efforts involved in determining the feasibility of resurrecting the historic downtown Los Angeles streetcar. Adhering to the vision, purpose, and need developed for this project, the concepts developed looked at providing the most efficient circulator services for residence and tourists within the core downtown area. In addition, estimated ridership and costs were calculated for each of the alignments to help in providing a comparative analysis, which will help in eventually narrowing down a preferred alternative.

The contents of this report are broken into eight major chapters that look to provide a summary and documentation for the work conducted for this feasibility study. Following this introduction, the chapters include:

- The review of the Purpose and Need and Transportation Vision for the streetcar,
- An outline of the engineering design criteria established,
- A summary of community and stakeholder involvement,
- A discussion on the development of the alignment concepts, including estimated travel times, ridership potential and cost estimates,
- A summary of the criteria and concept evaluation,
- The identification of potential funding sources, for both capital and operating expenses, and
- Next Steps.

1.1 HISTORY OF THE STREETCAR IN LOS ANGELES

During the population growth brought by the railroads in the late 19th century, rail transit proved to be the most desirable mode of public transportation in Los Angeles to connect development reaching from inland communities to the coast. In response to this demand, the first streetcar system in Los Angeles was the spring and West Sixth Street railroad in 1874. This line operated a small horsecar that traveled along a 2.5 mile route beginning at the Pico house in the downtown plaza.

As technology advanced, cable cars phased out the horsecar lines beginning in 1885. To power the new equipment, huge steam engines turned enormous wheels that pulled the cable down the open slot located between the rails. However, the wooden cross-ties of the cable car lines were laid in dirt on unpaved streets which were subjected to seasonal rains. Plagued with continual problems and as a result of the population boom of the late 1880's (when the City's population grew from about 11,000 to 50,000), it was thought the cable car needed to be replaced with a more efficient and powerful type of streetcar: the electric streetcar.

The first electric streetcar on the Pacific Coast was debuted by the Los Angeles Electric Railway Company in 1886, with the first extension being built along Pico Avenue in 1887. However a power plant failure in 1888 ceased operations. When Los Angeles reached a large enough population to achieve "City" status around 1890, the citizens were interested in good, efficient, localized transportation. A new owner bought and rebuilt the company and changed the name to the Belt Line Railroad Company, which later was incorporated into the Los Angeles Consolidated Electric Railway. Under new ownership the streetcar system grew and began to represent more than just transportation in Los Angeles, but the physical, cultural, and economic growth of the area. However, in 1895, dissatisfied bond holders reorganized the company into the Los Angeles Railway, which was later purchased by Henry Huntington (nephew of Collis Huntington of the Central Pacific (later Southern Pacific) Railroad). The system again

was changed to the Los Angeles Railway Corporation (LARy) in 1898. LARy became one of the largest and finest streetcar systems in the world and grew to a fleet of 1,250 cars by 1925.

The success was short-lived however, as single-family tract housing and the rise of automobile travel signified the end of the streetcar system in Los Angeles. The system depended upon concentrations of population for a good turnover, and in January of 1945, the Los Angeles Railway collapsed and was taken over by the Los Angeles Transit Lines, whose holding company was National City Lines, which was owned by Standard Oil, Firestone, and General Motors. The speedy metropolitan growth gradually choked out the privately owned Los Angeles Transit Lines. Without being able to provide a higher-speed public transit system, the streetcars were replaced by private automobiles. The Los Angeles Metropolitan Transit Authority was formed in 1958 as a state agency and owner and operator of the remaining streetcar system. However, as the freeway network improved and provided better and faster connections, the Metropolitan Transit Authority accelerated a diesel bus trend as an economic move and abandoned the streetcar system permanently on March 31, 1963, after 90 years of service. Today, the Red Cars on the San Pedro waterfront are the only functioning reminders of the era.

1.2 PROJECT BACKGROUND

The Los Angeles streetcar system was once the largest and most heavily used rail transit network in the world. The system operated for 90 years and covered roughly 600 miles of track using over 1,200 cars at its peak, with the system having a higher rate of public transit usage per capita than San Francisco does today.

Today, Los Angeles is going through a transit revival. Ironically, this revival is being driven in large part by the continual traffic congestion plaguing the same freeways that once were the reason for abandoning the streetcar. Since October 1997, a concept has emerged to reintroduce the historic Los Angeles streetcars as a vintage trolley to link together the various districts and communities of downtown Los Angeles. The general concept was to create a tourist attraction of historical significance that could also provide an additional means of transportation much like the Market Street Railway does in San Francisco today. The streetcar would help reinvigorate, connect, and promote downtown by unifying otherwise disparate business, cultural and entertainment communities.

In the summer of 2003, the Mayor's Office of Economic Development in conjunction with the Los Angeles Conservancy requested the Community Redevelopment Agency of the City of Los Angeles (CRA/LA) use a $100,000 Housing and Urban Development (HUD) grant secured by Congresswoman Lucille Roybal-Allard for conducting a feasibility study on the proposal to bring back the historic downtown streetcar as part of the continued redevelopment of downtown Los Angeles. With approval from the City Council, the CRA/LA initiated this study in the winter of 2005 to determine the feasibility of resurrecting the downtown Los Angeles streetcar service. The major components of this feasibility study consist of:

- Public outreach efforts that include one-on-one meetings with downtown stakeholders and key elected officials and creation of a Project Development Team and Project Advisory Group to help provide local input into the planning process,
- Develop a Purpose, Need and Vision Statement for the streetcar based on the community issues, concerns, and ideas,
- Develop initial concepts for where an Initial Operating Segment (IOS) would serve and what these concepts might cost, and
- Determine what funding sources are available and what the next steps in resurrecting the streetcar should be.

2.0 PURPOSE AND NEED SUMMARY

One of the first steps in determining the feasibility of resurrecting the downtown streetcar was to identify the purpose and need for the system in today and tomorrow's downtown, and to outline a vision for the system to help guide its development and design.

Identifying the purpose and need for the streetcar required understanding the existing and forecasted demographic characteristics of the downtown area, as well as an understanding of the existing travel characteristics and largest economic markets.

This chapter of the report summarizes the demographic profile, travel characteristics, and markets of the downtown area that helped in defining a transportation vision and purpose and need for resurrecting the streetcar.

2.1 DEMOGRAPHIC PROFILE

2.1.1 POPULATION PROFILE

The population of downtown Los Angeles is a developing demographic which has only recently begun to grow rapidly. According to the United States Census Bureau, in the year 2000 there were 136,228 people residing in the vicinity of the downtown area, with the majority of these residents located in the northern and western regions of the downtown vicinity in locations such as Chinatown and neighborhoods west of the I-110 freeway. For 2010, the number of residents for this same area was projected by the Southern California Association of Governments to be just over 150,000. The "Central City" area of Los Angeles as stated in a report prepared for the Central City Association in February 2004 has a population of 25,208 in 2000. The rate of growth for the resident population in this area is expected to increase with the recent surge in the downtown adaptive reuse and new housing construction; redevelopment and conversion of new condominium projects.

In 2004, there were 27 structures being converted for residential use and 7 new residential buildings under construction. No less than 6 of these new buildings were for-sale units, signifying a shift in trend from rental to ownership properties. As of 2005 there were an estimated 16,395 existing residential units, according to the Mayor's Office of Economic Development.

As of year 2005, there are over 3,000 new units under construction, nearly 1,000 units that have been permitted, approximately 1,600 units planned between 2005 and 2007, and nearly 2,000 units planned beyond 2007. This presents a total of 7,600 new residential units currently planned or under construction within the downtown area, in addition to the 16,395 units already in existence.

2.1.2 EMPLOYMENT PROFILE

As identified in the 2004 Economic Overview and Forecast report for the Central City Association, the employment within the downtown area needs to be carefully assessed as a result of fluctuations in the economy. Total employment within the downtown and surrounding areas peaked in 1995 at 612,000 as a result of a jump in the government sector due to the 1994 Northridge earthquake, and slipped to a low of 367,500 in 1998. Government employment has tended to swing widely from each year. In addition, many of the smaller businesses and districts are not fully captured in the employment statistics.

The employment in downtown continues to fluctuate, with growth occurring in 2001 and 2002, and declining in 2003. The average total employment for the downtown and surrounding areas in 2004 was estimated at 502,300, with growth again projected to occur in 2005. Currently, downtown Los Angeles and surrounding vicinity is the largest business district in the Western United States.

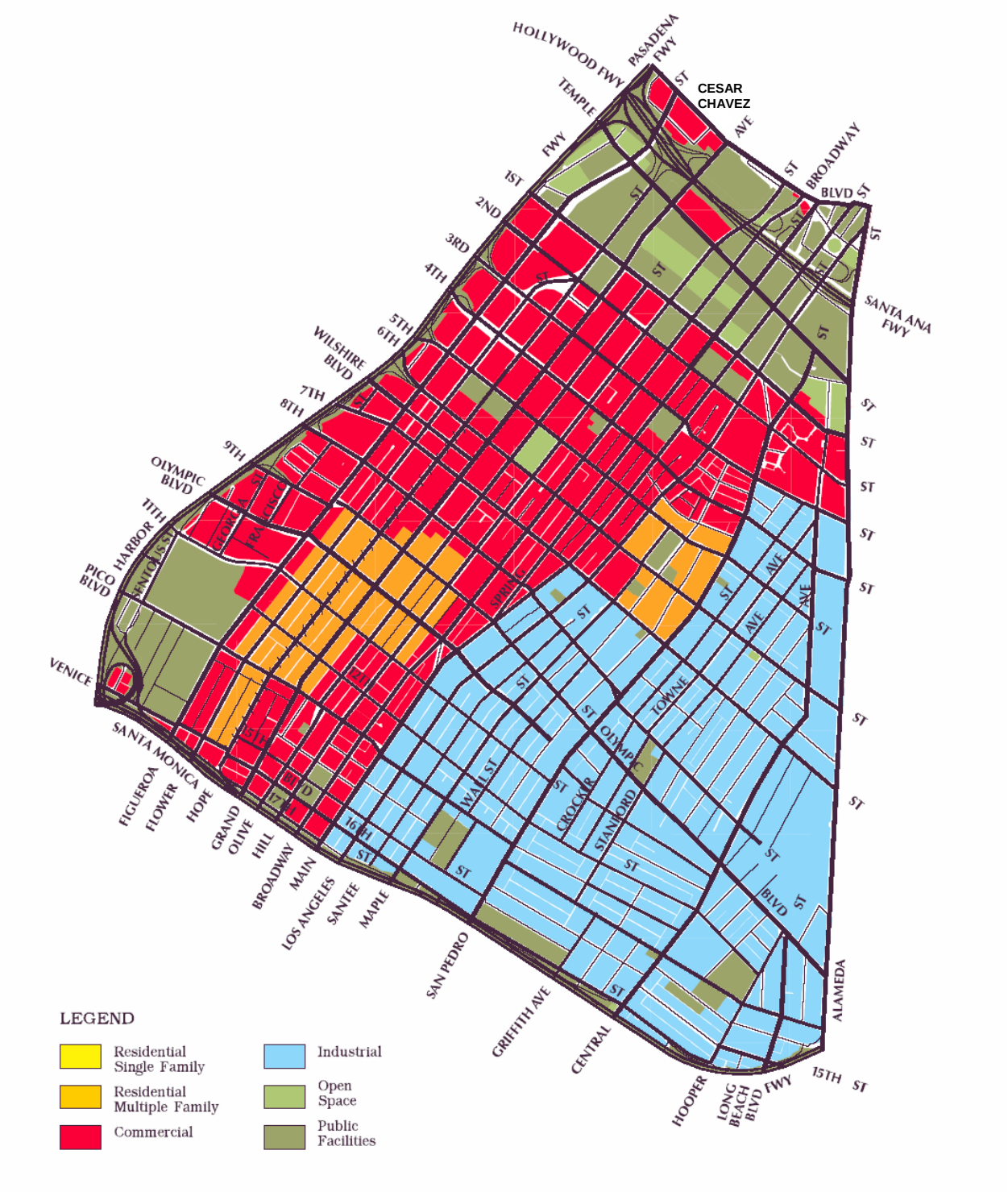
Despite the fluctuations, the government sector continues to be the largest employer within the downtown area, followed by professional and business services, education and health services, manufacturing, and financial services.

2.1.3 LAND USE

The central region of the Central City, generally along a north-south direction between Main and Figueroa Streets, has largely consisted primarily of community and regional high-density commercial and industrial uses. Within this region, medium to high density multi-family residential units are being developed, many of them in areas that have been traditionally commercial in nature. This land use is developing in the southern and central regions of the "Central City". The planned land uses in the Los Angeles downtown area are shown in **Figure 2.1-1**.

A mixture of light and heavy industrial land uses exist along the eastern half of the Central City, east of Main Street, and adjacent to the Alameda District in the north eastern portion of the study area. The remaining land uses within the downtown area are designated for public facilities and open space.

Figure 2.1-1: Central City Land Use Plan



2.2 TRAVEL CHARACTERISTICS

This section summarizes the existing travel characteristics within downtown Los Angeles by describing the growing travel markets, such as tourism and recreation, and identifying the changing travel patterns within downtown.

2.2.1 TOURISM AND RECREATIONAL MARKETS

The tourism and recreational activities are strong and growing markets that are responsible for attracting millions of local, regional and international visitors to the downtown area each year. With the existing and projected increases in the number of residential units available and the construction of the planned recreational and cultural projects, such as Grand Avenue and L.A. Live the volume of people traveling to, from or within the downtown area is expected to increase substantially. The peak commute travel markets will no longer be the sole major travel market that will affect the downtown area. Of particular concern will be the tourism and recreational travel markets, especially during weekends and evening hours. This shift in the travel demand and market, can be expected to create a variety of challenges on key local and regional transportation modes, and could in effect create a niche that the streetcar may be able to fill that will not necessarily be covered by the Metro regional transit network.

2.2.2 TRAVEL PATTERNS AND MARKETS

Historically, the travel patterns related to the downtown area presented peak inbound travel during weekday mornings and peak outbound travel during weekday evenings, with relatively stagnant travel during night time and weekend hours. However, the travel patterns for downtown Los Angeles are changing as a result of the increasing residential population now residing within the Central City. Using the available demographic data a qualitative analysis was conducted to determine the primary travel markets that exist within the downtown area. These markets include; tourism (including conventioneers), residential, business and government (including commuters), retail, and recreational.

Tourism

As previously mentioned, tourism is an important and growing market within downtown Los Angeles, with nearly 10 million people visiting the area each year. For this study the tourism market is broken into two categories; 1) Tourists, and 2) Convention Visitors.

- Tourists are defined for this study as local and regional visitors that live within the Southern California area and may visit downtown Los Angeles for short vacations or during the weekend to take in the sights and sounds of the various districts, such as Grand Avenue and Broadway or historical venues, such as El Pueblo, Union Station, Chinatown or Little Tokyo. This market also includes visitors who are visiting the Los Angeles area from outside of Southern California and could include national or international guests.
- Convention Visitors are those visiting the downtown area for the specific purpose of attending functions at the Convention Center. The Los Angeles Convention Center hosts numerous conferences, events and other functions each year and is a major economic generator for the downtown area. This market creates a high demand for hotels located within the downtown area as well, with conventions or events usually lasting multiple days.

Residential

This market focuses on those that rent or own residential units within the downtown area. This is a growing market within the Central City and is transforming downtown Los Angeles from a "9 to 5" place of business to a 24-hour a day hub of activity. Existing transportation services do not yet effectively service this "24-hour" market and will be an important market to consider for the streetcar system.

Business and Government

The business and government market remains one of the largest markets within the downtown area, with over 40% of the land use devoted to commercial and financial businesses and government functions. Though this market is currently served by the existing bus and metro rail systems, the streetcar can prove to be an effective downtown connector service between the transit hubs of Union Station and 7th/Metro.

Retail

Retail is an important market that is usually excluded when considering potential transit markets. In downtown Los Angeles, the retail market is showing a revival as the residential population of the area continues to grow. Also, regional retail developments are now emerging near established sports, entertainment, and cultural venues; as an example, the LA Live project next to Staples Center will create a large new regional retail hub in Downtown, while the Grand Avenue project would be adjacent to the Disney Concert Hall. As a result, this market will be important to consider in determining the function of the streetcar system.

Recreation

The recreational market can sometimes be linked with the tourism market, but also includes sports venues and events (i.e. Staples Center) and cultural destinations (i.e. Music Center or museums). This market is important to the tourist, residential and retail markets as well because it provides entertainment and business for these markets.

2.3 TRANSPORTATION VISION

This section summarizes the initial vision defined for the resurrected streetcar in the Los Angeles downtown area. It builds on the previous planning studies performed for reintroducing streetcar services into the downtown as well as the existing systems currently under design, and presents a preliminary set of goals and objectives for a possible streetcar system based largely on input from meetings with key community agencies and stakeholders.

The goals and objectives, guiding principles, and initial system concept were intended, and will continue to stimulate discussion on major issues that must be addressed over the course of designing the streetcar system. The ensuing vision will define the key features and characteristics of a downtown streetcar system, and define the range and types of system elements to be considered.

Based on discussions with community stakeholders, agencies and elected officials, several initial goals and objectives were identified and include:

- Develop a System to Support Both Visitors and Residents
- Develop a Cost-Effective System
- Support Local Plans
- Allow for Service Integration
- Involve Local Citizens and Policy-Makers
- Pay homage to the Red and Yellow Car systems

In addition, the following list summarizes the overall guiding principles that were developed as a basis for establishing how this project should move forward. These include:

- Plan for the Future, Not the Present
  - Plan the system for tomorrow's downtown, not today's
  - Consider the transportation-land use connection
- Make it Affordable and Buildable
  - Minimize freeway crossings
  - Minimize the impacts to local parking
- Make it Simple
- Make Sure it Connects
  - Connectivity to existing and proposed Metro rail Lines
  - Connectivity to commuter and intercity rail system
  - Connectivity with local and community bus system
- Make it Easy to Live With
  - Flexibility
  - Minimize community impacts (including noise)
  - Strong community outreach and awareness
- Make it Attractive
  - Develop a user friendly system
  - Allow for frequent headways and longer hours of operation
  - Make sure it serves largest economic and tourism generators

3.0 ENGINEERING DESIGN CRITERIA

In order to develop realistic alignment concepts for a resurrected downtown streetcar, a set of engineering design criteria must be established. These criteria are then used in conjunction with the goals and objectives to determine the appropriate technology, appearance, requirements, and capabilities for the streetcar and how it might integrate into the downtown community.

The criteria presented in the following sections represent the most common design features that have been incorporated into other downtown streetcar systems across the United States and would likely be incorporated into a streetcar system for downtown Los Angeles. The first set of criteria relates to the general infrastructure of the system such as track gauge, distances, vehicle specifications, utilities, and power requirements. The second set of criteria focuses on the general standards applied to stations and stops and includes station locations, clearances, ADA requirements, platform heights, and pedestrian signage. The third set discusses the standard design criteria applied to typical maintenance yards and includes yard size, equipment requirements, parking, landscaping, and shop space.

Figures 3.0-1 and 3.0-2 illustrate alternative configurations of the streetcar operating in mixed traffic, either in curbside or median lanes.

3.1.1 DESIGN CRITERIA: VEHICLES TRACK AND SYSTEMS

Design Element	Recommended Standard[1]
Vehicle Height including pantograph	13 feet minimum - vertical clearance of 14 ft required
Vehicle travel width	11 foot minimum travel lane; the trolley would fully share the street with other traffic
Vehicle length	60-70 feet
ADA access	Need to meet ADA requirements
Track gauge	56.5 inches, standard gauge[2]
Track Slab	8'2" wide, concrete construction
Vehicle weight	60,000 – 65,000 lbs.
Passenger Capacity	30-40 seated ~80 standees
Minimum horizontal curve radius	60 ft
Minimum vertical curve radius	620 ft
Spiral length	25 ft
Maximum grade	9%
Maximum cross slope	1%
Maximum operating speed	30-40 mph
Vehicle Acceleration/Deceleration Rate	3mph/sec
Electrical Requirements	Operating 750 Vdc Systems 24 Vdc
Substations	2 Substations – 200-300 sq. ft. each (1 plus 1 back up)

[1] These requirements may be adjusted in consultation with the actual operator of the system, and if it is to be the Metro, closely correlated with existing Metro system, maintenance and performance requirements.

[2] As background, the Los Angeles Red Cars used standard gauge of 56.2 inches, while the Los Angeles streetcars used a narrower 42" gauge. It is more cost effective and more compatible with the Metro rail system if the standard gauge is used.

3.1.2 DESIGN CRITERIA: STOP AND STATION AREAS

Design Element	Recommended Standard
Stop location curbside at intersection	Far side of intersection preferred to minimize interference with right turns
Stop Location in median	10' wide raised median minimum with safety railing or simple fence against the traffic side and clear pedestrian crosswalk
Sidewalk areas	Minimum of 6 ft clearance around stop areas
Curb roadway clearance	2 foot wide tactile warning strip at curb
Curb height	Raised to allow level boarding whenever possible
ADA requirements	Need to meet all access requirements per City of LA codes. Clearance between station elements should be at least 5 feet between all stationary components such as posts, walls, seating, street furniture, and buildings.
Signage requirements	Clear distinctive station signage is very important. Metro Rapid signage design is a good example.
Shelter requirements	Compact design and good visibility of approaching street cars. Not all stops need shelters if space is limited, a simple attractive sign may suffice.

Note: The intent of stops for a streetcar operation is to provide easy access with simple, unobtrusive design elements. The trolley system is not at all intended to have major station facilities such as is typically done for light rail systems.

3.1.3 DESIGN CRITERIA: MAINTENANCE YARD

Design Element	Recommended Standard
Shop Facility	Facility for routine inspections, maintenance work and light repairs only. Heavy repair and overhaul work will be done elsewhere. Enclosed building, inspection and light repair capability. Pit track, overhead crane, paved truck access, employee locker room, staff offices, parts and material storage, work and machine shop. Employee parking area.
Yard	Storage and Cleaning Tracks; 8-car capacity with paved maintenance aisles.
Vehicle storage capacity	8 streetcars
Employee Locker Rooms, Shop Office Areas	3,000 square feet
Shop, Tool, Equipment and Work Areas	25,000 square feet
Access track	Dependent upon shop location
Parking Area	12 spaces
buffer landscaping/screening	3 foot minimum around perimeter
Lighting standard	1/2 foot candles in yard shielded to minimize light pollution to neighbors
Security fencing	Perimeter of Yard
Acreage	2-3 acres

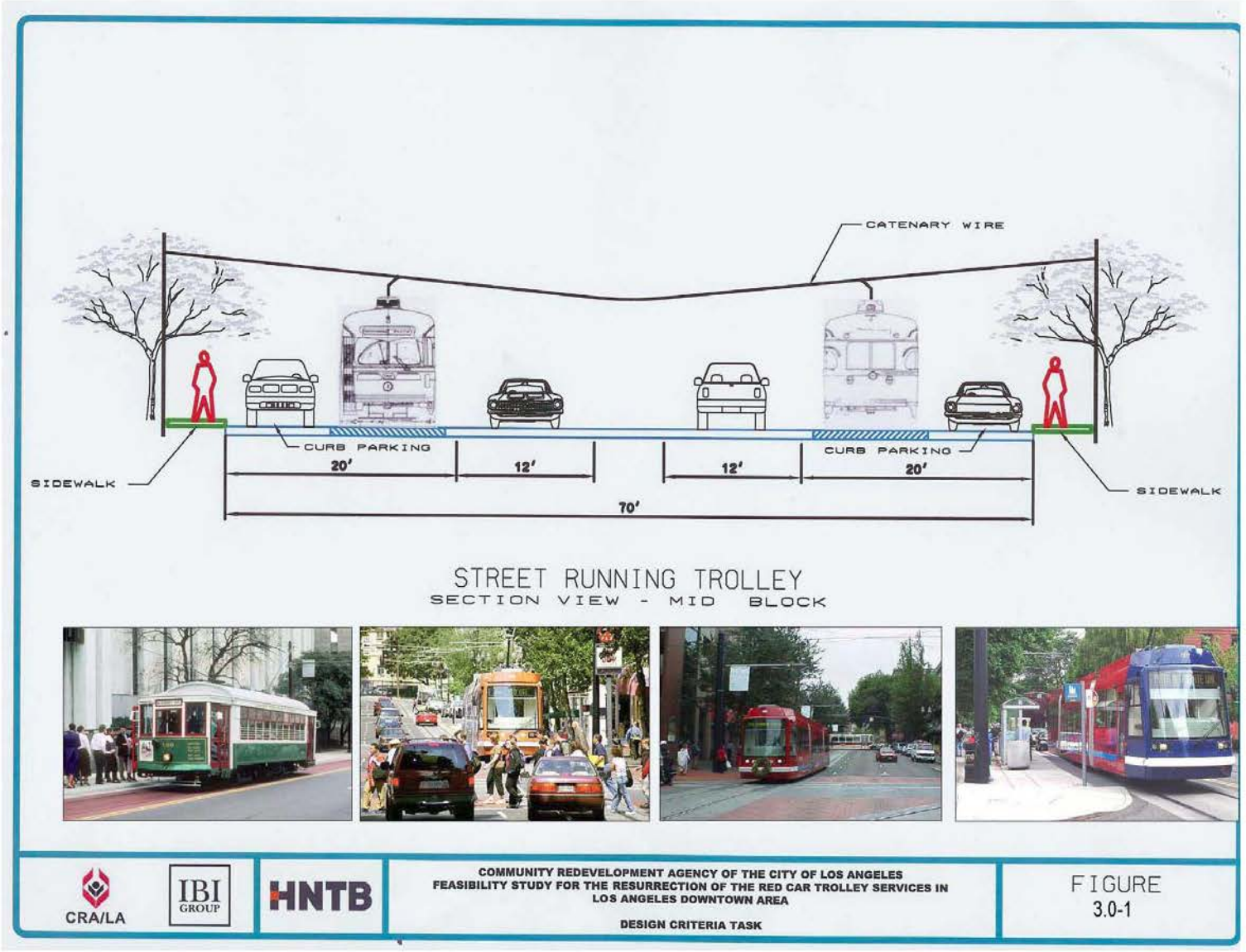


Figure 3.0-1: Street Running Trolley

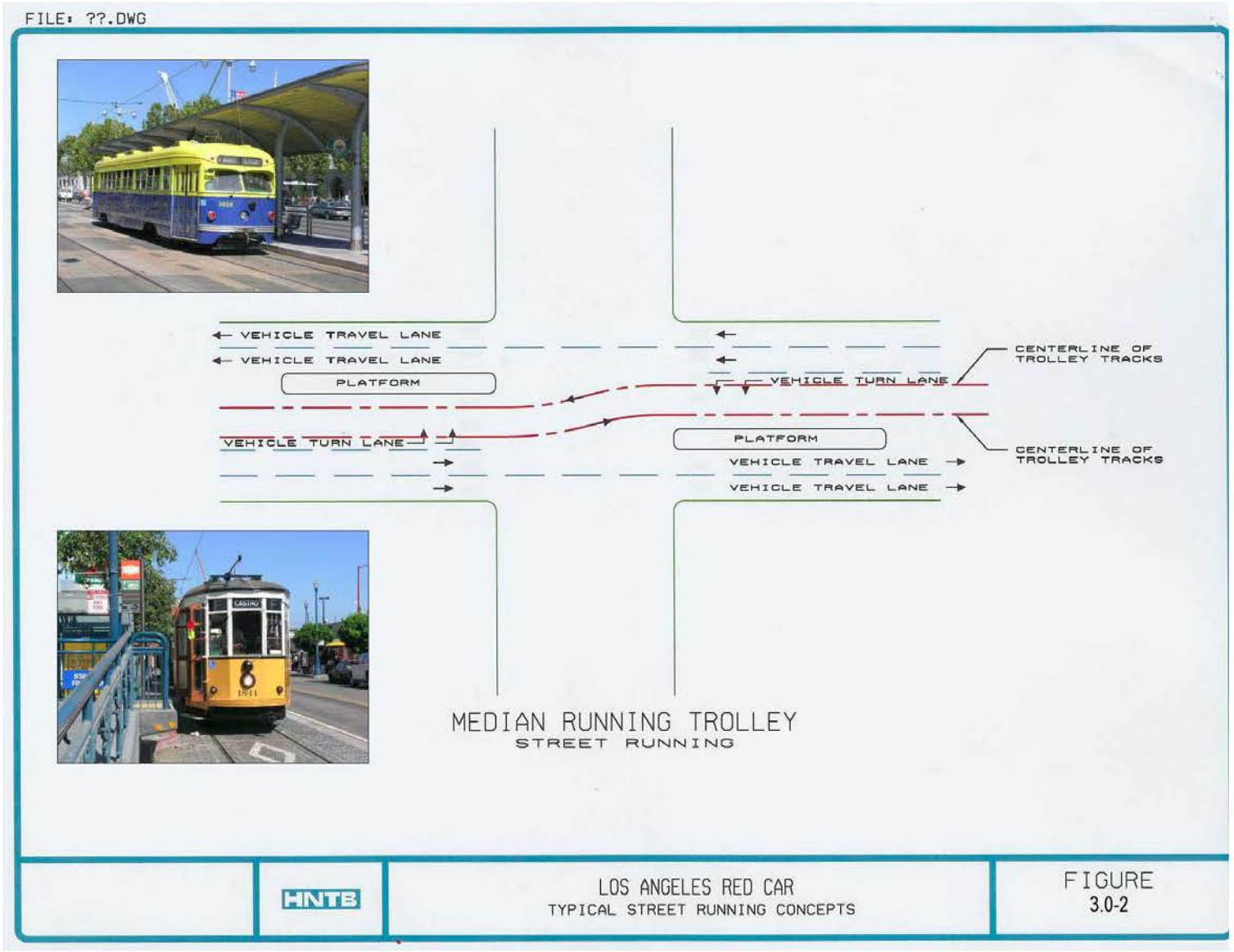


Figure 3.0-2: Median Running Trolley

4.0 SUMMARY OF COMMUNITY PARTICIPATION

An important component to this feasibility study has been gathering the input and opinion of downtown stakeholders, which included residents, businesses and elected officials. Early in this study, a Community Participation Plan was developed that outlined the people, organizations, and agencies that it was important to communicate with in this early state of the project.

From this Plan two advisory "committees" were created to help identify issues, concerns, and alternative solutions as well as provide community insight and ideas. The first was the Project Development Team (PDT), which comprises representatives from the Consultant Team, the CRA/LA, Metro, the Los Angeles Department of Transportation (LADOT), the Central Cities Association (CCA), and the Los Angeles Conservancy. This group was created to provide a sounding board for technical issues and considerations that might need to be addressed as the alignment concepts were identified.

The second group was created to begin involving the downtown community in the planning and development process of this project. The Project Advisory Group was created by the CCA and the LA Conservancy to include representatives from the local Business Improvement Districts (BID's), local neighborhood councils, local businesses and developers, and its original non-profit Red Car Advisory Group.

In addition to these two groups, the Consultant team also participated in one-on-one meetings with local, state, and federal elected officials to receive input on issues that may not have been covered by the two committees. A summary of these one-on-one meetings is provided in Section 4.2.

4.1 INTERACTIVE WORKSHOP

As part of the public participation process, initial alignment concepts were developed by the Project Advisory Group in an interactive workshop held on August 30, 2005. Workshop participants divided into three groups to create ideas on possible alignments for a resurrected streetcar system. Participants were given the equivalent of three miles of pipe cleaner to form what they thought was the best alignment for the Initial Operating Segment (IOS) of the streetcar. In addition, they were given a list of the pros and cons of how each street in the downtown may be affected by streetcar operations, along with a list of guidelines that consisted of a project boundary and other considerations to keep in mind (such as suggesting that avoiding over-crossings, under-crossings and tunnels helps reduce the costs). When finished, each group summarized their proposed alignment, explained their reasoning behind their decisions, and provided additional comments and ideas on major points of interest in downtown that should be considered.

4.2 ONE-ON-ONE MEETINGS

One-on-one meetings were held with downtown stakeholders and offices of elected officials on July 18, 2005 and September 19, 2005. The following meetings were held and representatives from each office are noted:

July 18

- Central City Association - Victor Franco, Jr.
- Council District 14 Office (formerly Councilman Villaraigosa) - Lisa Sarno
- Office of Councilwoman Jan Perry (CD 9) - Greg Fischer
- Office of Councilwoman Ed Reyes (CD 1) - Gerald Gubatan
- Los Angeles Conservancy - Ken Bernstein, Trudi Sandmeier

September 19

- Office of County Supervisor Gloria Molina - Nicole Englund
- Office of Congresswoman Roybal-Allard - Eddie Tafoya, Angela Sur, Kimberlee Tachiki
- Office of Assembly Speaker Fabian Nunez –Alejandra Velazquez
- Office of State Senator Gil Cedillo - Mel Ilomin and Senator Cedillo

Overall, all participants were supportive of the concept of reviving the historic streetcar in downtown Los Angeles. They are supportive of moving the process forward and exploring issues of feasibility, routing and funding. Below is a summary of comments from each meeting.

4.2.1 CENTRAL CITY ASSOCIATION

The Central City Association (CCA) is supportive of the streetcar project. They believe the streetcar should serve both tourists and residents and has the potential to spur development in certain areas. They expressed interest in the line going down Broadway or Spring Street. It was mentioned that Steve Needleman (owner of The Orpheum Theater) wants to see it on Broadway. Hotel owners will want to see it serving the hotels and convention center.

If the Business Improvement Districts (BIDs) end up paying for part of the system, they will want it in their areas. It was felt that it may not be necessary for the streetcar to go up to Bunker Hill. It is important that it provide service to the core. It was suggested that Staples Center has liked Figueroa as a possible route, north of 7th + Fig. The CCA believes that there will be a lot of support for the project. In planning the system, it was mentioned that downtown Los Angeles is different than most other cities in that it has a much bigger street grid network with very long blocks.

The CCA believes that there will not be too much attention paid to the streetcar design, but they suggested that a historic look might be preferred. They suggested that charter cars for special parties be considered, and suggested the idea of branding along the cars. They deferred decision of this however to the Project Advisory Group.

4.2.2 LOS ANGELES CONSERVANCY

The Conservancy is supportive of the idea to resurrect the downtown streetcar and sees this project as a tool for economic development that can highlight downtown attractions, create an attractive even fun amenity for downtown's visitors, employees, and residents. The Conservancy also believes that this project can link the two downtowns: historic core to new attractions.

They believe that Broadway is a logical corridor to construct the initial system. The streetcar can connect to nighttime uses and invigorate uses of the theaters. There is also momentum on Broadway - from its Million Dollar Theater to 9th and Broadway, it is becoming a new energy center. The Arcade Building is also being refurbished.

The Conservancy believed that it would be a missed opportunity not to provide service to the Convention Center, Staples Center or the new L.A. Live development. They believe that a crescent shaped route connecting the proposed Grand Avenue Project with the Convention Center and L.A. Live along Broadway makes the most sense. They also felt it was important to make sure the streetcar provided service to the area from 9th to 3rd on Broadway. Along Broadway, the streetcar should stop every block to provide the greatest amount of access.

4.2.3 COUNCIL DISTRICT 14

At the one-on-one meeting, Council District 14, which was without a Councilmember at the time following the election of Antonio Villaraigosa was represented by Ms. Lisa Sarno. It was expressed that public outreach is and will continue to be very important. Several questions were presented by Ms. Sarno that included: 1) what kind of resident groups will be involved? 2) How can the project be funded? 3) Could the BIDs help fund this project? And 4) what is the timeline for the study?

It was suggested that Fiesta Broadway will be a good public outreach contact for Council District 14 on this project. In addition to downtown, other communities in the district have expressed interest in dedicated trolley lines, such as Atwater, Silver Lake, and East Side. Ms. Sarno suggested that something along the Broadway corridor would be important. It will also be important to focus on making this system a way for people to get to work, shop, and enjoy their neighborhood. Gallery owners within the downtown area should also be contacted about the proposed streetcar.

Parking issues will also be important and coordination with the downtown merchants will need to happen on any mitigation issues.

4.2.4 COUNCIL DISTRICT 9

Greg Fischer of Council District 9 echoed the Los Angeles Conservancy suggestion of a crescent shaped system, starting at the Convention Center and L.A. Live, head to Broadway, and take Broadway north to connect to the Grand Avenue area.

Concerns were raised about how LADOT may react to streetcar service along any street. It was suggested that they might resist it, especially if the system required dedicated right-of-way. It was mentioned that the project will face more conservative views from City Council on this matter, such as concerns about safety, side boarding, middle boarding, and islands.

It was pointed out by Mr. Fischer that it is important to keep up-to-date on upcoming changes to certain DASH services. There is also ongoing work on taxi issues, such as providing better options for taking a taxi. Mr. Fischer expressed that Council District 9 is also interested in seeing some one way streets become two way streets.

4.2.5 COUNCIL DISTRICT 1

No comments were provided by Council District 1 at this time, but they requested to be kept informed on the project.

4.2.6 OFFICE OF COUNTY SUPERVISOR MOLINA

There is enthusiasm from the County Supervisor Molina's office for the process moving forward. Several questions were asked about the cost of the project and where a project development study would fit into the downtown planning process. Ms. Englund appreciated the map and materials and said she would share them with the Supervisor and her Deputy.

4.2.7 OFFICE OF CONGRESSWOMAN ROYBAL-ALLARD

The meeting with representatives of Congresswoman Lucille Roybal-Allard lasted approximately 45 minutes. In particular, this office wanted to see more attention paid on access to Chinatown and Little Tokyo. They asked about the composition of the Project Advisory Group and stated they would like to see representation from Chinatown, Little Tokyo, and area neighborhood council (Historic Neighborhood Council). It was explained that there are cost challenges in crossing the 101 with a streetcar system to directly serve Chinatown, but that alignment alternatives would be considered.

Angela Sur stated that constituents would like to see better travel options in the evening. Currently, DASH does not meet everyone's needs. The Congresswoman would also like to see better access to the Arts District and Little Tokyo, which are areas that are working hard to bring in outsiders. Questions were also asked about a transfer station between the streetcar and the Gold Line extension. Other topics included "best practices" from other cities and concern about the 9th Street Elementary School if a route goes near there.

Overall, the office is supportive of the project and would like to see of their issues addressed. As with other offices and agencies, they are also supportive of bringing the Broadway Corridor into the project.

4.2.8 OFFICE OF ASSEMBLY SPEAKER NUNEZ

Alejandra Velazquez stated the office is supportive of the project. Several general questions were asked about funding, how proposed routes could interface with the DASH system, and the timeline for such a project.

4.2.9 OFFICE OF STATE SENATOR CEDILLO

Mel Ilomin stated the Senator was an early proponent of reviving the downtown streetcar, which is consistent with his interest in historic preservation. Again, general questions were asked such as who would operate the system, what kind of fares would be charged, and what alignment people are leaning toward. Senator Cedillo also participated in part of the meeting and is very enthusiastic about the project and would also like to see the historic Broadway Core a prominent part of the alignment options.

5.0 DEVELOPMENT OF ALIGNMENT CONCEPTS

The alignment concepts defined in this section were developed using the following approach.

As was mentioned as part of the public participation process, initial alignment concepts were developed by the Project Advisory Group in an interactive workshop held on August 30, 2005. Workshop participants divided into three groups to create ideas on possible alignments for a resurrected streetcar system, summarizing their proposed alignment, and providing additional comments and ideas on major points of interest in downtown that should be considered.

Following the creation of the three alignments by the Project Advisory Group, the data presented in the Purpose and Need and Visioning Statement on existing and future population and employment figures, visitor destination information, existing transit services, proposed developments, local policies, and the issues and considerations guidelines developed were reviewed to refine the alignments. Next, the insights gained from the one-on-one meetings with local, state, and federal elected officials and downtown stakeholders were considered in expanding or modifying the identified alignments.

In reviewing the concepts developed by both the consultant and the Project Advisory Group, some common themes began to appear, which, taken together begin to form a central core area for the streetcar to serve.

The common themes are presented in **Figure 5.0-1**. The first theme is that a north-south connection along or near the Broadway Historic District should form the backbone of a system. The Broadway corridor is one of the most heavily used transit-oriented corridors in downtown Los Angeles and provides a dense variety of commercial, retail, and residential developments.

The second most common theme was for the end-points of the alignment to focus at or near the Staples Center, Convention Center, and new L.A. Live development in the south, and the Music Center, Walt Disney Concert Hall, and Grand Avenue Project to the north. Lastly, a third theme focused on the ability of the streetcar to also provide connections by way of station stops, pedestrian paseos, or connecting transit services to:

- Chinatown and the El Pueblo Historic Districts,
- Little Tokyo and the Arts Districts,
- Fashion District,
- Convention Center hotels and the Financial District, and
- University of Southern California (USC) and Exposition Park.

Using these steps and themes, the three alignment concepts created by the Project Advisory Group were refined and two new ones added. Each alignment concept will be evaluated, revised and reviewed by the Project Advisory Group and other downtown stakeholders and elected officials in subsequent phases of the project, where the best elements of each concept can be recombined in order to narrow the number of Initial Operating Segments (IOS) to ones that most efficiently and effectively addresses the objectives of the vision.

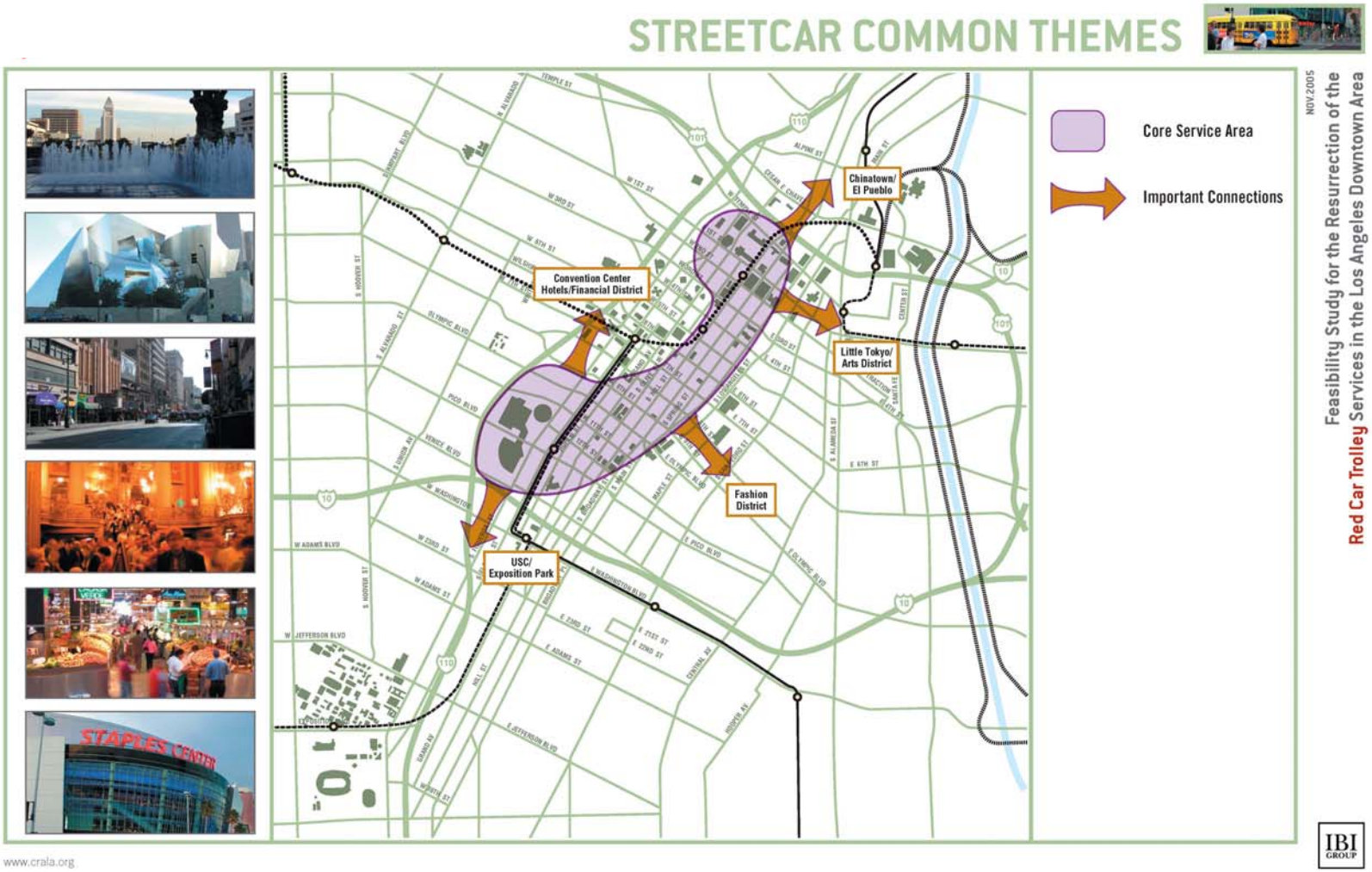


Figure 5.0-1: Streetcar Common Themes

5.1 ALIGNMENT CONCEPTS

5.1.1 CONCEPT 1

Concept 1, as illustrated in **Figure 5.1-1**, operates as a reverse ”S” and was designed to serve the most prominent existing and proposed residential and tourist destinations, such as the L.A. Live, the Broadway Historic Core and the proposed Grand Avenue Project. This alignment would provide service to the residential developments along Hope Street as well as serve the new Ralphs market at the intersection of Hope and 9th Streets. It provides connections to the soon-to-be reopened Angels Flight, as well as to the Fashion District. These connections, in conjunction with the larger developments and the historic core, seek to provide an attractive downtown circulator for residents as well as a user-friendly system that will attract and allow tourists to comfortably travel around the downtown area.

This concept would travel from north to south along Hope Street, from the intersection with Hope Place, north to 1st Street, east to Broadway, south to 7th Street, west to Hope Street, south to Pico Boulevard and then north on Broadway to the intersection with Olympic Boulevard. Using Hope Street to serve the L.A. Live and Convention Center prevents the need to cross Metro’s Blue and Exposition Lines, which could pose operating issues because of high frequencies along the Metro Rail corridor once the Exposition Line begins service.

5.1.2 CONCEPT 2

Concept 2, presented in **Figure 5.1-2**, provides a loop service around the downtown core area in order to connect the new and old downtowns. This concept focuses on providing service to the Bunker Hill area and the Music Center concert halls, Herald Examiner Project, Grand Avenue Project, South Park area as well as the Fashion District, L.A. Live, the Broadway Historic Core, and the Financial District.

This concept would travel east along First Street to Broadway, south to 11th Street, serve L.A. Live via Figueroa, then cut back to Flower Street on Olympic Boulevard, and travel north along Flower Street to First Street.

5.1.3 CONCEPT 3

Concept 3, illustrated in **Figure 5.1-3**, serves the major destinations within the downtown area and allows for short walking distances to others. This concept focuses on serving the largest tourist destinations, such as the Convention Center, Fashion District, the Broadway Historic District, Grand Avenue Project, the Walt Disney Concert Hall and Music Center and Little Tokyo.

Concept 3 differs from the others in that it would operate as a one-way loop through Little Tokyo and the Civic Center Districts, traveling along First Street, Grand Avenue, Temple Street, Los Angeles Street, and Second Street. This concept also looks at crossing the Santa Ana Freeway (101) to serve El Pueblo via Los Angeles Street. Operations along Temple would allow for the streetcar to also serve the Cathedral of our Lady of the Angels, in addition to the Walt Disney Concert Hall and Music Center.

5.1.4 CONCEPT 4

Concept 4, presented in **Figure 5.1-4**, was developed in part to allow for a sensitivity analysis to be conducted on streets other than those presented in Concepts 1, 2, and 3. This concept looks at extending the streetcar through Little Tokyo, providing a direct connection to the new Metro Gold Line station near the Alameda Street/1st Street intersection, and providing direct service to the Fashion District along Maple Avenue and Los Angeles Street.

Concept 4 travels along Los Angeles, Temple, Alameda, and First Streets through Little Tokyo and the Civic Center to the north. The alignment uses Los Angeles Street to connect north and south downtown and serves the Fashion District along Maple Avenue for two blocks before connecting to Grand Avenue

via Olympic Boulevard. From Grand Avenue, the alignment uses 11th Street to cross over the Metro Blue and Exposition Line, and then turns south on Flower Street and west on 12th Street into the Convention and Staples Center area.

5.1.5 CONCEPT 5

Similar to Concept 4, Concept 5 was also developed to conduct a sensitivity analysis on streets in addition to those presented in Concepts 1, 2, 3, and 4. This concept, presented in **Figure 5.1-5**, extends the streetcar north of the 101 freeway to Chinatown and its Metro Gold Line station, as well as providing service to the Pershing Square area and its Metro Red Line station.

This concept travels south from Chinatown along Alameda and Main Streets, crossing the 101 freeway and turning west onto Temple Street, south onto Hill Street, east on 1st Street, and south on Spring Street. To provide a connection to Pershing Square while minimizing conflict with the Metro Red Line, the alignment uses 5th and 6th Streets to connect to Hill Street. From Hill Street the alignment travels along one-way couplets (8th and 9th Streets) depending on the direction of travel, then south on Hope Street, turning west onto 11th Street to cross over the Metro Blue and Exposition Line, south on Flower Street and west on 12th Street into the Convention and Staples Center area.

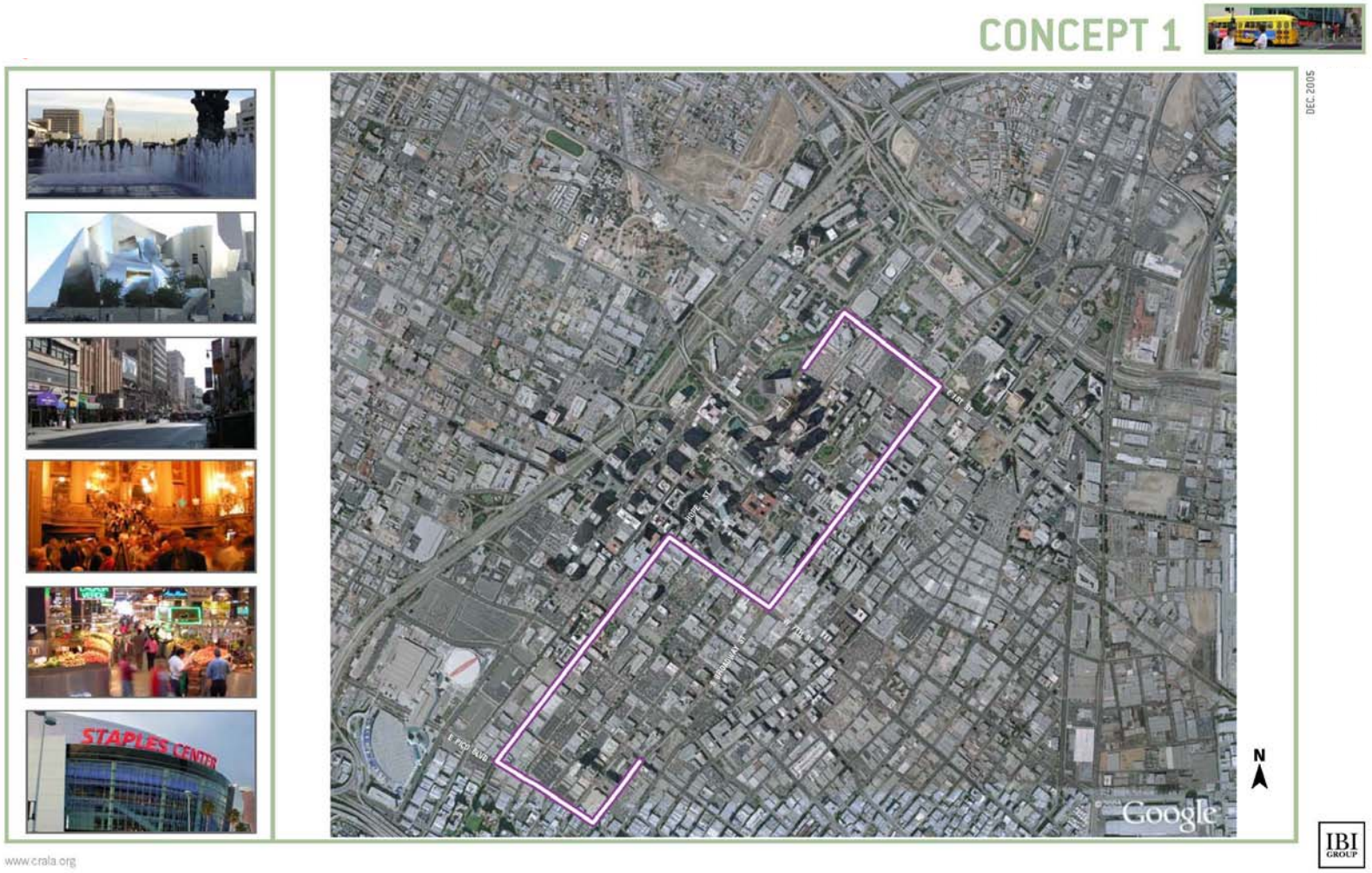


Figure 5.1-1: Concept 1

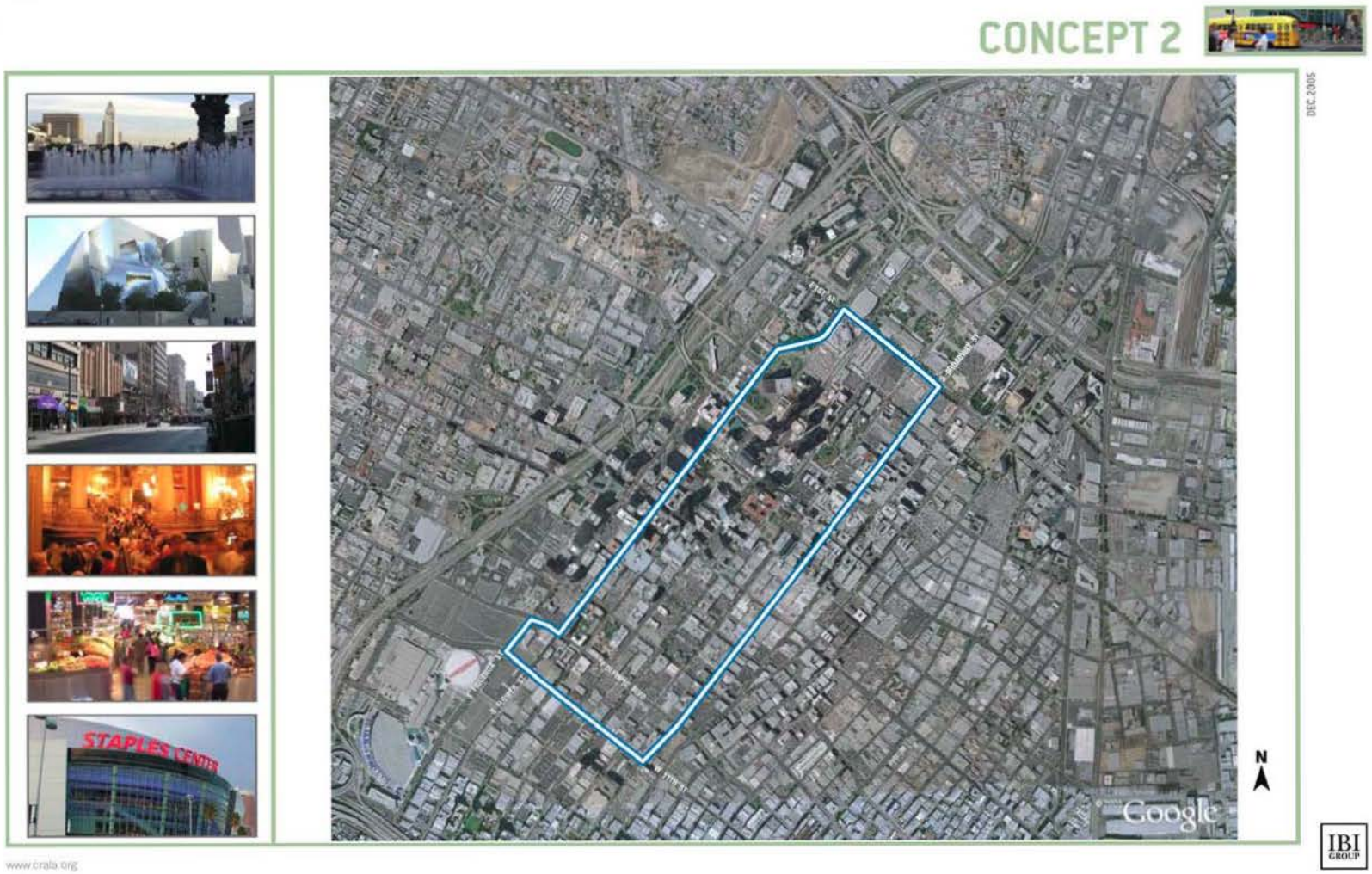


Figure 5.1-2: Concept 2

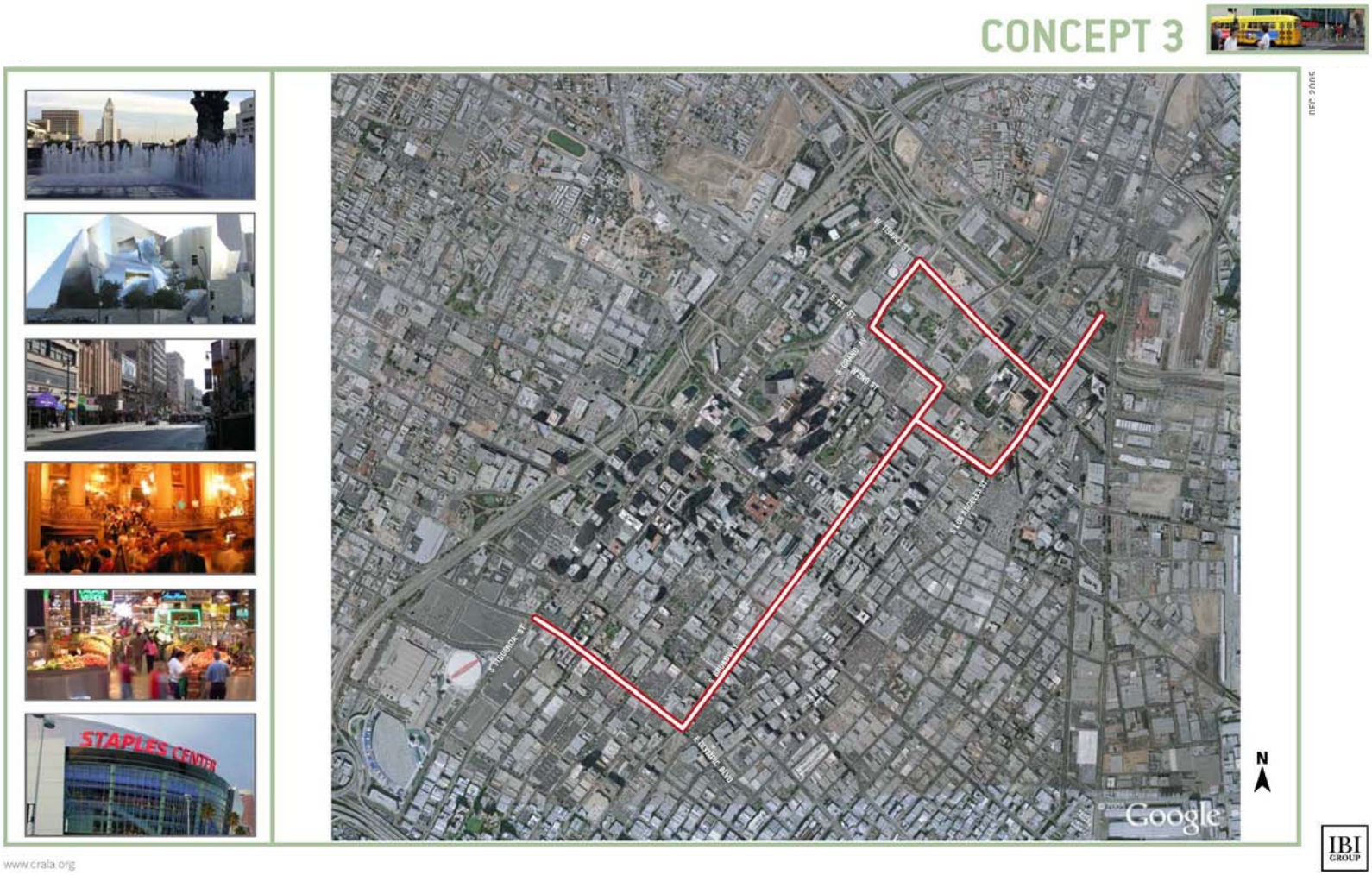


Figure 5.1-3: Concept 3

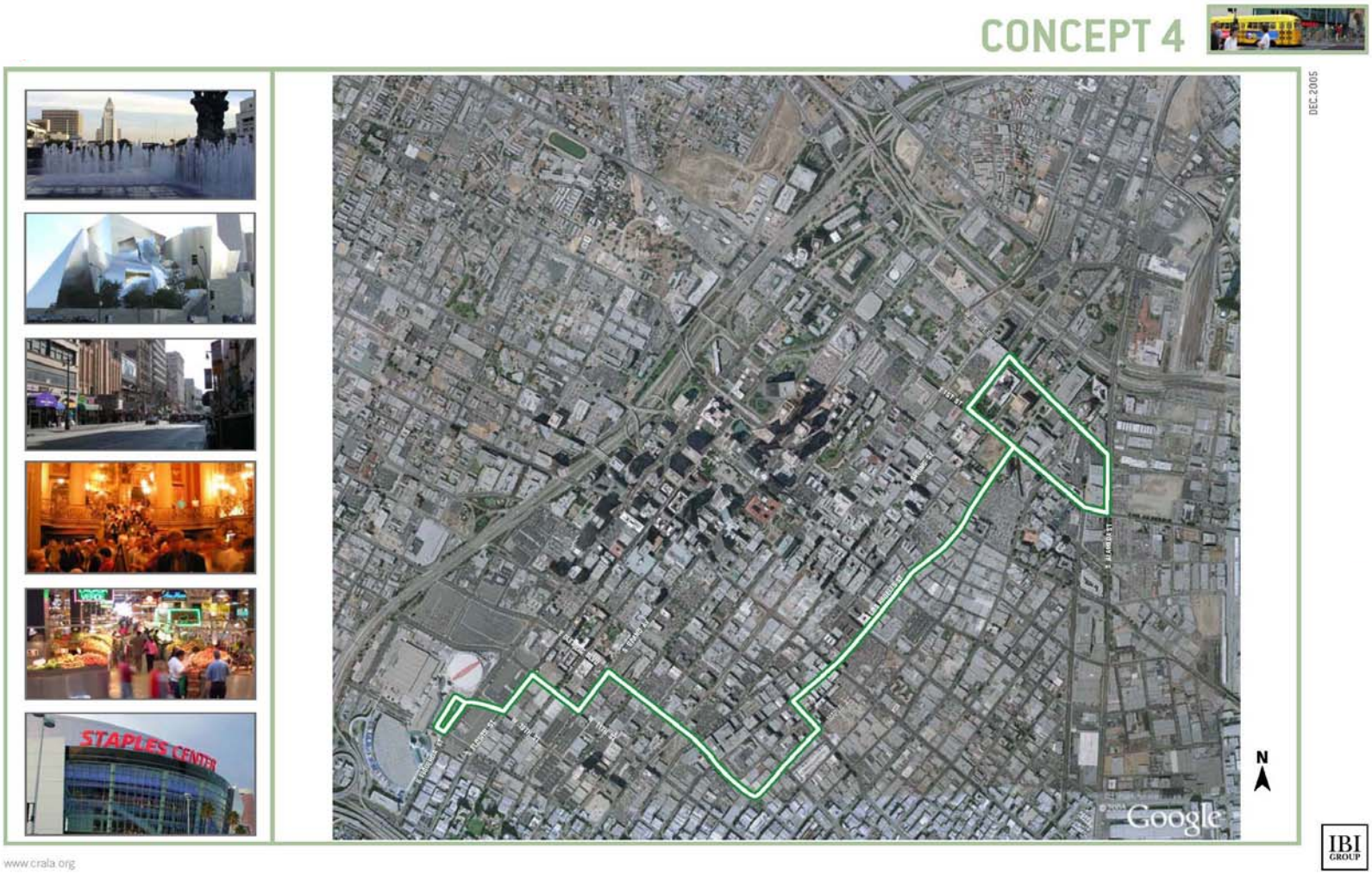


Figure 5.1-4: Concept 4

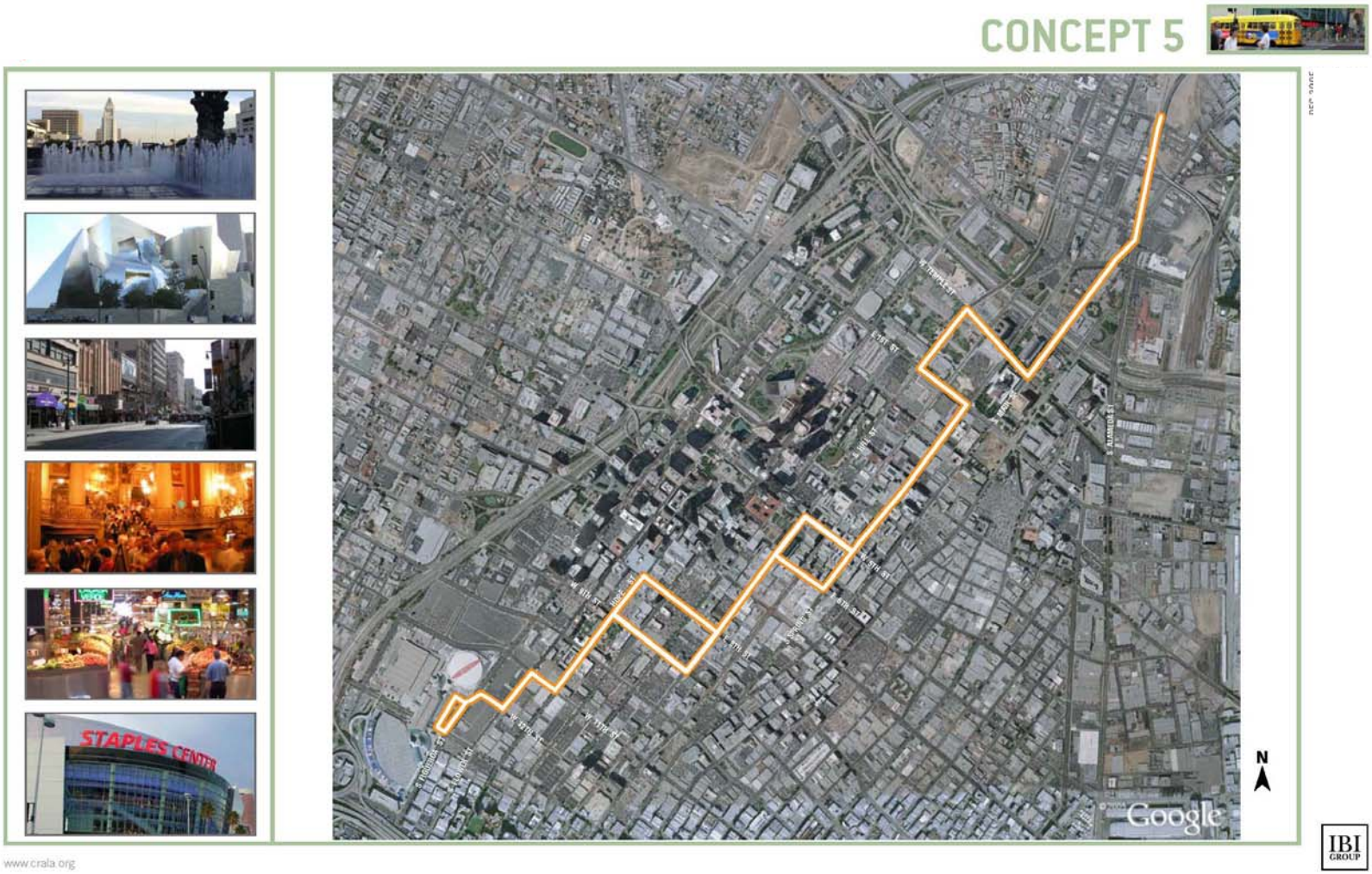


Figure 5.1-5: Concept 5

6.0 ESTIMATED TRAVEL TIMES & RIDERSHIP POTENTIAL

6.1 TRAVEL TIME ESTIMATES

Travel times were estimated for each of the alignment concepts, based on the length of the alignment, type of right-of-way (which sets the upper limit on speed), spacing and location of stops and interaction with traffic signals (including their locations, probability of stopping and cycle times).

Tables provided in **Appendix A** summarize estimated one-way stop-to-stop travel times used to represent the streetcar system to help in evaluating the efficiency of the concepts and their potential to attract riders. The travel times developed can also be used in future studies when carrying out a detailed demand model.

Overall, one-way travel times were calculated that ranged from 16.4 minutes to 29.0 minutes (amounting to average end-to-end speeds between 9.0 mph and 14.0 mph). The tables presented in the Appendix show the stop locations and the traffic signals that would be encountered along each of the alignments. Average speeds typically were higher on north-south streets usually because block distances are further apart than east-west streets resulting in greater distances between signalized intersections. Across all of the alternatives, the average speeds were similar, with Concept 2 presenting the highest average speed. Concept 3 presented the fastest travel time from end-to-end and is also the shortest route.

As an initial assumption in developing these conceptual travel time estimates, streetcar stops were placed on average every two blocks. Stops were placed more frequently in locations that were assumed to have the potential for higher demand (i.e. Civic Center, Music Center, and the Historic District).

6.1.1 STREETCAR FLEET REQUIREMENTS

The travel times developed were also used to help estimate fleet requirements, which affects not only the capital and operating cost of the streetcar fleet but the minimum requirements for a maintenance facility. Lower travel times and higher frequency are beneficial in providing good service and attracting riders and also tend to lead to lower system costs.

For the travel times shown in the table, an average two-way trip would take approximately 50 minutes. Accounting for recovery time at the two ends of the route, a complete round trip cycle (the time between the scheduled starts of each round trip by a specific streetcar) would be approximately 57 minutes. The peak number of streetcars in operation is at a minimum the round trip cycle divided by the headway (time) between trains. To be able to provide ten-minute headways would require at least six streetcars to be in operation. In order to ensure the appropriate vehicle capacity, this estimate should also be checked against the forecast ridership once a more detailed ridership estimate is conducted.

6.2 RIDERSHIP ESTIMATES

Potential ridership is a key factor in the decision to construct any public transportation project. The ridership projections that are developed usually involve using regional transportation analysis models that calculate the ridership on a regional scale. The intent of the downtown streetcar however focuses primarily on local and not regional ridership. As a result, standard transportation models alone are not sensitive enough to calculate the differences in ridership between alignment concepts and stop locations.

As an alternative for this feasibility study, a qualitative analysis was conducted on the ability of each alignment to attract the greatest number of riders. This analysis was based on three calculated factors: 1) which venues in downtown Los Angeles see the greatest number of visitors, 2) alignments that will

provide the service to these venues and provide the fastest travel times, and 3) alignments that serve the greatest number of residential, commercial and retail developments.

In addition, in order to provide average boardings per mile that can be expected from the downtown streetcar, a ridership benchmark table was created to evaluate the average ridership experienced by similar downtown streetcar systems in the United States. The benchmark identifies what could be considered a "typical" ridership that the system could expect to obtain.

Table 6.2-1 summarizes the travel times, number of stops, and a market access index (MAI) factor, which takes into account the number of activity and residential developments and most visited venues served by the streetcar, in order to present a basic comparison of each alignment with regard to its potential to attract riders. Note that due to the variation in the destinations served and the route lengths and configurations among the five concepts, an end-to-end travel time is not a meaningful comparison for ridership estimation purposes. Instead, the travel times reported are for a one-way trip between 11th and Hope and 1st and Broadway, the two furthest points which are common to all concepts; three of the concepts serve these points directly, while the other two come within one block. Using this methodology, the alignments reflecting faster travel times and a higher market access index are more likely to attract higher ridership.

Table 6.2-1: Ridership Factors by Alignment

Alternative	Travel Time (min)	No. of Stops	Market Access Index
Concept 1	10	36	69
Concept 2	9.2	34	80
Concept 3	14.4	31	85
Concept 4	20.8	31	52
Concept 5	14.2	34	82

6.2.1 RIDERSHIP BENCHMARK

A list of eight historic rail and streetcar operations across the United States was compiled to determine a ridership benchmark for a downtown Los Angeles streetcar. The ridership for each of these systems varies depending on the markets served, with the systems reflecting the greatest number of boardings being able to cater to multiple markets (e.g. residential, business, tourism, and recreational) and operate as part of the regional transportation system. As presented in Table 6.2-2, the average ridership on these eight systems is about 970 boardings per mile; however, this includes San Francisco and New Orleans (before Hurricane Katrina forced suspension of operations), two systems that are extremely well-integrated with their corresponding regional systems and traverse very dense environments. Conversely, the San Pedro system is very short, does not provide service every day, and does not operate in a downtown environment. Without these three systems, the average is 540 boardings/mile. Using this benchmark analysis, and considering that a downtown Los Angeles streetcar system would likely fall somewhere between the higher-ridership and lower-ridership systems, a reasonable ridership for planning purposes would be about 600 to 700 boardings per mile,. For comparison, the average boardings per mile of the Los Angeles Metro rail system are provided in order to illustrate the basic difference in demand between local and regional oriented transit systems.

Table 6.2-2: Historic Streetcar Ridership Benchmark and Comparison

Mode	Location/System	Avg. Daily Boardings	Route Length (miles)	Boardings/Mile
Streetcar	San Fran Muni "F" Line	20,000	8.0	2,500
Streetcar	Tampa	1,250	2.4	521
Streetcar	Portland Streetcar	4,000	4.8	833
Interurban	San Pedro	390	1.5	260
Streetcar	Dallas	420	3.6	117
Streetcar	New Orleans*	15,000	6.5	2,308
Streetcar	Seattle	1,400	1.8	800
Streetcar	Little Rock	1,100	2.5	440
Average System Boardings per Mile				*972*
Average w/o SF, NO and SP				*542*

**Pre-Hurricane Katrina*

Local System Comparison

Heavy Rail	Metro Red Line	115,000	17.4	6,609
LRT	Metro Blue Line	77,000	22.0	3,500
LRT	Metro Green Line	32,000	20.0	1,600
LRT	Metro Gold Line	18,000	13.7	1,314

7.0 CONCEPTUAL COSTS

This chapter summarizes the estimated costs that may be associated with the implementation and operation of the historic streetcar system. The costs are shown in total and unit costs per mile. These initial costs are intended to assist in providing a basic comparison of the level of investment that may be required for resurrecting the downtown streetcar.

7.1 CAPITAL COSTS

Capital costs have been estimated for the concepts shown previously in Section 4.1. The estimates have been created based on experience with other downtown streetcar systems and use a "unit rate" approach, where the major components of each concept are quantified and multiplied by typical average unit costs.

Table 7.1-1 presents the capital cost estimates for each concept of the proposed downtown streetcar system. These costs reflect the latest alignment concepts. The costs can be refined based on any revised assumptions. The construction cost elements include:

Vehicles

- 6 Vehicles in operation, (1 spare)

Construction Components

- Track, both double track and single track
- Civil and Street Improvements
- Rte. 101 Freeway Modifications
- Stops/Pedestrian amenities
- OCS / Traction Power
- Traction Power Substations
- Communications and Rail Signals
- Maintenance Facility
- Right-of-Way

Engineering Components

- Engineering
- Construction Management

Contingency

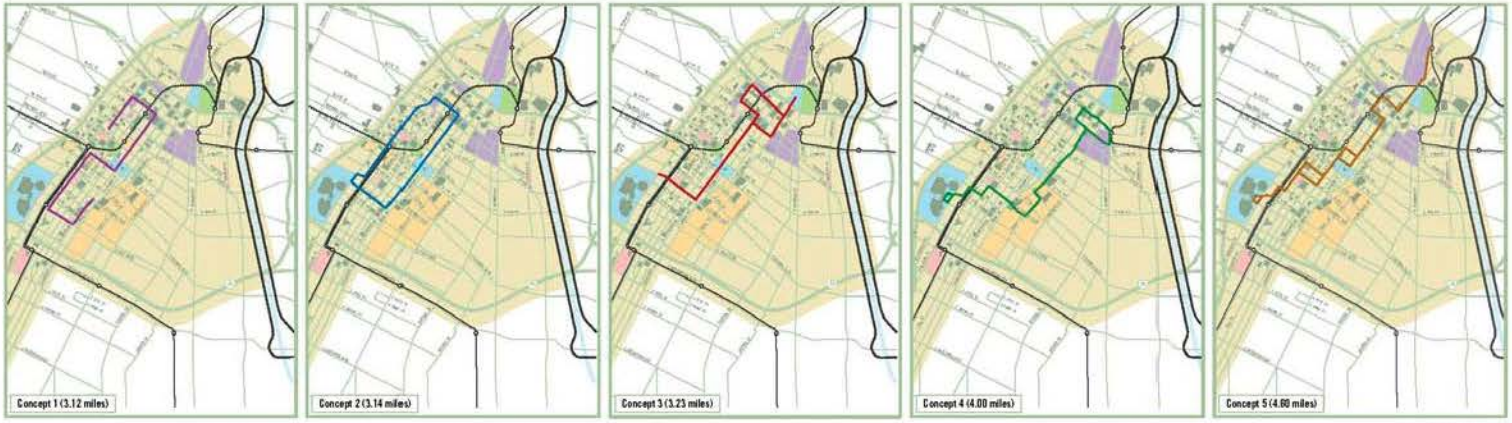
- 25% Contingency

Factors that may alter these costs include:

- Number of cars operated;
- Single track verses double track configurations;
- Number of turns;
- Complexity of stops/stations;
- Availability of right-of-way and whether it is government or privately owned; and
- Crossing of the Rte. 101 freeway and whether the overcrossings and the freeway need to be modified.

ESTIMATED CONCEPT COSTS

			Concept 1 (purple) 3.12 miles		Concept 2 (blue) 3.14 miles		Concept 3 (red) 3.23 miles		Concept 4 (green) 4.00 miles		Concept 5 (orange) 4.60 miles	
Item	Unit	Unit Cost ($2005)	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Vehicles (6 in operation, 1 spare)	Each	$1,200,000	7	$8,400,000	7	$8,400,000	7	$8,400,000	7	$8,400,000	7	$8,400,000
Track (per 1 trk mi. in 2 trk limits)	Track Mile	$1,200,000	6.24	$7,488,000	6.28	$7,536,000	3.50	$4,200,000	4.80	$5,760,000	5.60	$6,720,000
Track (per 1 trk mi. in 1 trk limits)	Track Mile	$1,600,000	0.00	$0	0.00	$0	1.48	$2,368,000	1.60	$2,560,000	1.80	$2,880,000
Civil and Street Improvements	Per Mile	$500,000	3.12	$1,560,000	3.14	$1,570,000	3.23	$1,615,000	4.00	$2,000,000	4.60	$2,300,000
101 Freeway Overpass Modifications*	Lump Sum	$2,000,000	n/a	$0	n/a	$0	1	$2,000,000	n/a	$0	1	$2,000,000
Stations/Pedestrian amenities	Each	$250,000	12	$3,000,000	12	$3,000,000	12	$3,000,000	12	$3,000,000	12	$3,000,000
OCS / Traction Power	Per Mile	$2,000,000	3.12	$6,240,000	3.14	$6,280,000	3.23	$6,460,000	4.00	$8,000,000	4.60	$9,200,000
Traction Power Substations	Each	$1,000,000	3	$3,000,000	3	$3,000,000	3	$3,000,000	3	$3,000,000	3	$3,000,000
Comm / Rail Signal	Per Mile	$250,000	3.12	$780,000	3.14	$785,000	3.23	$807,500	4.00	$1,000,000	4.60	$1,150,000
Traffic Signal Modifications	Per Mile	$100,000	3.12	$312,000	3.14	$314,000	3.23	$323,000	4.00	$400,000	4.60	$460,000
Maintenance Facility	Lump Sum	$2,500,000	1	$2,500,000	1	$2,500,000	1	$2,500,000	1	$2,500,000	1	$2,500,000
Right of Way	Lump Sum	$5,000,000	1	$5,000,000	1	$5,000,000	1	$5,000,000	1	$5,000,000	1	$5,000,000
Construction				$38,280,000		$38,385,000		$39,673,500		$41,620,000		$46,610,000
Engineering	%	10%		$3,828,000		$3,838,500		$3,967,350		$4,162,000		$4,661,000
Construction Management	%	15%		$5,742,000		$5,757,750		$5,951,025		$6,243,000		$6,991,500
Subtotal				$47,850,000		$47,981,250		$49,591,875		$52,025,000		$58,262,500
Contingency	%	25%		$11,962,500		$11,995,313		$12,397,969		$13,006,250		$14,565,625
Grand Totals				$59,812,500		$59,976,563		$61,989,844		$65,031,250		$72,828,125



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* Assuming only minor overpass modification; a new or significantly modified freeway overpass would be significantly more costly.

Table 6.1-1

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Table 7.1-1: Estimated Concept Costs

7.2 OPERATING COSTS

Table 7.2-1 presents the operating unit cost assumptions for the proposed downtown streetcar system. These assumptions reflect the latest alignments concepts. The operating cost elements include:

- Total Operating Cost, using Cost/Mile
- Total Operating Cost, using Cost per Operating Hour

Table 7.2-1: Operating Cost Assumptions

Item	Hours / Day	Days / Year	No. of Cars	Mph / Car	Cost / Mile	Cost / Hour	Total Operating Cost
Operating Characteristics	18	365	6	5	$20	$120	
Total Operating Cost, using Cost/Mile							$3,942,000
Total Operating Cost, using Cost per Operating Hour							$4,730,400

Sources:
1. *APTA Heritage Trolley and Streetcar Operating Cost Estimate Data*
2. *Pittsburgh Post Gazette, March 1, 2005 article on proposed Atlanta Streetcar Program*
3. *Construction Costs and Operating Costs of Vintage Trolleys, Federal Transit Administration, 1992*
4. *El Paso Streetcar Reactivation Project, Kimley Horn & Associates, 1995*
5. *Winston-Salem Journal, June 17, 2005 article "Revised Streetcar Plans Run on More of Fourth Street"*

8.0 EVALUATION OF CONCEPTS

This chapter summarizes the high level evaluation conducted of each of the alignment concepts using readily available demographic, traffic, forecasted growth data, and field inspections of existing conditions. The purpose of the evaluation was to allow for basic comparisons to be made between the alignments in order to eventually select the most promising elements of each alignment for use in developing a preferred alignment.

8.1 EVALUATION CRITERIA

A key task of this study involved the systematic evaluation of the pros and cons associated with the alignment concepts. The evaluation criteria for this study were developed based on three categories, 1) Operations, 2) Transportation Considerations, and 3) Community Interaction. Each of the specific criteria under these categories drew upon what was determined to be the most relevant factors based on input collected from all previous work as well as public comment.

These criteria were used to evaluate each concept in order to identify the tradeoffs of each concept in some detail. A framework was created that focused on a detailed approach for screening developed from the list of specific criteria that included travel times, ridership potential, cost, circulation impacts, parking impacts, connections to Metro Rail, noise impacts, and physical constraints.

The following table summarizes each category, associated evaluation criteria, and approach that were applied in analyzing each of the alignment concepts.

Category	Evaluation Criteria	Approach
Operations	Travel Times	Qualitative (degree of interaction with traffic) and quantitative estimates (stop and signal delays)
	Ridership Potential	Qualitative assessment based on activity and residential developments served.
	Costs	Quantitative comparison of the total estimated capital and operating costs.
	Physical Constraints	Qualitative assessment of physical obstacles (operational, infrastructure, topography, and slopes)
Transportation Considerations	Circulation Impacts	Qualitative review of operations for each traffic and streetcar movement at all critical locations, Quantitative review of the number of streets crossed, which provide freeway access
	Parking Impacts	Qualitative estimate of remaining on-street parking
	Connectivity	Qualitative review of the ability to enhance regional connectivity
Community Interaction	Noise Impacts	Qualitative review based on the potential for noise during turning movements as a result of flange squeal
	Local Policy Support	Qualitative assessment based on conversations with elected officials and local stakeholders
	Service to Designated Redevelopment or Improvement Areas	Count of the number of Business Improvement Districts and designated redevelopment areas served by each alternative

8.2 ANALYSIS OF CONCEPTS

8.2.1 OPERATIONS

The criteria developed to evaluate the operations of the proposed streetcar system focused on possible travel times, ridership potential, costs, and the physical constraints of each of the concepts.

Travel Times

This was a quantitative measure that described possible "end-to-end" trip times that were calculated based on available traffic information and existing conditions. In addition, the projected travel times are used to determine the ability that each alignment might have to attract riders, taking into consideration, among other factors such as the number of residential and activity centers served, the assumption that faster travel times will help to attract a greater number of riders.

As discussed in section 6.2, using the actual end-points of each concept to derive travel times is not useful as a point of comparison due to the variation in the destinations served and the route lengths and configurations among the five concepts. Instead, once again the travel times reported are for a one-way trip between 11th and Hope and 1st and Broadway, the two furthest points which are common to all concepts. **Table 8.2-1** summarizes the round trip travel times and total number of stops for each alignment.

Table 8.2-1: Travel Time and Stop Summary

Alternative	Travel Time (min)	No. of Stops
Concept 1	10	36
Concept 2	9.2	34
Concept 3	14.4	31
Concept 4	20.8	31
Concept 5	14.2	34

Ridership Potential

The ability to serve the greatest amount of activity centers and residential developments will be essential for a downtown circulator. This study provided a quantitative review by calculating the number of existing and projected activity centers and residential developments each alternative might serve within one block of the proposed alignments. The more developments an alternative might serve, the greater the potential for higher ridership.

Concepts which provided alignments that travel north-south in the South Park area seemed to have the greatest potential to serve many of the existing and planned residential developments. Most notable were those concepts that would provide service along Hope Street or adjacent streets within one block on either side. Concept 3 presents the lowest potential for serving residential developments because the alignment avoids many of the residential streets in the South Park area.

The concepts that focused on serving the Grand Avenue, L.A. Live Developments and the Broadway Historic Core along with the major visitor destinations near the central core of the downtown provide the greatest service to downtown activity centers. Concept 1 provides service to the greatest number of activity centers by focusing on service to the primary theme areas developed by the downtown stakeholders. In contrast, Concept 4 provides service to the fewest activity centers as a result of traveling east of the Broadway corridor and primary downtown core.

Physical Constraints

Important to the selection of a preferred alignment will be the ability for the streetcar to tackle any operational and infrastructure constraints and the topographical features associated with Bunker Hill in downtown.

Concepts 1 and 2 both traverse Bunker Hill. This has the potential to be a fatal flaw if the slope approaching and leaving the Bunker Hill area is greater than 8 or 9 percent.

Further, Concept 2 presents several additional potential conflict points and topographical challenges. To the north, the elevation and grade of Flower Street to 1st Street, as well as 1st Street to Broadway could prove too steep for streetcar service. To the south, crossing the Metro Blue and Exposition Lines at-grade could prove operationally difficult depending on the frequencies of the Metro services, and traffic along Figueroa may be too congested to allow for efficient streetcar operations.

Potential constraints for Concept 3 could come from the cost associated with constructing or retrofitting a bridge to cross the 101 freeway, and with possible topographical challenges of Bunker Hill along 1st Street and Grand Avenue.

For Concept 4, potential constraints arise in the southern portion when traveling along Flower Street, where the right-of-way may be too narrow as a result of the Metro Blue and Exposition Lines occupying the eastern portion of the right-of-way.

Similar to Concept 4, Concept 5 has the potential to impact traffic and operations when traveling along Flower Street. For both Concepts 4 and 5, access to the L.A. Live development along 12th Street was recommended by AEG, the developer and land owner of the property.

Estimated Cost

One of the most important factors in implementing any transportation system is the cost. The lower the cost, the more favorable the system is seen to construct.

Concept 5 presents the highest estimated cost for construction and implementation. Even so, the cost of Concept 5 could be much higher if a new or significantly modified structure over the 101 Freeway at Main Street is required. Concepts 1, 2, and 3 are relatively similar in cost, despite Concept 3 being roughly 0.8 of a mile shorter. Crossing the freeway at Los Angeles Street escalates the cost of Concept 3, bringing it closer to the cost of Concept 4.

Concepts 1 and 2 present the lowest costs. Both concepts are similar in distance and do not require tunneling or the crossing of any freeways or rivers. As a result, the overall costs for both Concepts 1 and 2 are nearly $2 million less than Concept 3, which represents the next lowest cost.

8.2.2 TRANSPORTATION CONSIDERATIONS

This section reviews the considerations that were made when determining the impact to traffic and the connectivity to existing and proposed regional transit services in the downtown area.

Circulation Impacts

Circulation and traffic impacts are typically associated with identifying the reduction in capacity or vehicle flow along a particular alignment, and with the number of major intersections that an alignment will pass through. Since the exact alignment and configuration for this system are not yet known, and therefore any reduction in capacity can not yet be determined, a qualitative analysis was conducted on the potential impacts to traffic circulation by determining the total number of turning movements for each concept, whether the concept operates along a street that provides access to the freeway, and whether the concept crosses any streets that provide access to the freeways. Streets that provide access to the freeways typically see heavier congestion, especially during peak commute times. As a result, any

concept which operates along or crosses one of these streets has a greater potential to impact traffic circulation.

In general, all the concepts for the streetcar are not expected to have major traffic impacts, as they will operate along existing streets in mixed flow traffic, and many of the alignments identified for this study are along streets where the historic streetcars once operated, which minimizes the amount of capital improvements that would be required. Using signal priority at selective intersections may enhance the operations. Minor street and lane adjustments may also be necessary for all concepts to accommodate enhancements such as stop platforms and pedestrian access.

Parking Impacts

While the streetcar is intended to provide a pedestrian oriented service to the downtown residents and businesses, the loss of on-street parking has the potential to have a negative affect on local businesses. For this study, a qualitative assessment was conducted that looked at the number of streets and city blocks that have on-street parking and therefore might have the potential to lose this parking.

All the concepts will affect on-street parking to some extent however the concepts which have the greatest potential to impact parking are Concepts 1 and 4. In contrast, Concept 3 presents the lowest potential for impacting a large amount of on-street parking.

Connectivity with Metro Rail

This is a qualitative measure that summarized how the different concepts and individual routes may be able to enhance local mobility and circulation by connecting to the major regional transportation hubs in downtown Los Angeles.

Concept 1

- Regional transit connections can be made to the Metro Blue, Red, and future Exposition Lines at three different station locations.

Concept 2

- Regional transit connections can be made to the Metro Blue, Red, and future Exposition Lines at two station locations.

Concept 3

- Regional transit connections can be made to the Metro Red Line at one station location near the Civic Center.

Concept 4

- Regional transit connections can be made to the Metro Blue, Gold, and future Exposition Lines at two station locations.

Concept 5

- Regional transit connections can be made to the Metro Blue, Gold, Red, and future Exposition Lines at four different station locations.

8.2.3 COMMUNITY INTEGRATION

How the streetcar integrates into the Downtown communities will be important to its success. This section analyzed the benefits and impacts the streetcar concepts can have to the Downtown residential and business communities.

Noise Impacts

A qualitative assessment was conducted to determine the potential for greater noise impacts by identifying the number of turning movements each concept may present. With steel-wheel on steel-rail equipment, turning movements have the potential to produce a flange squeal where metal is scraping against metal. For this study, those concepts with a greater number of turning movements were identified as having the potential for greater noise impacts.

The greatest number of turning movements is made by Concepts 4 and 5, each with over 20 turning movements in each direction, where Concepts 2 and 3 provide the fewest number of turning movements with less than 10 in a roundtrip.

Another noise issue associated with rail systems is the need to sound horns or bells. Any operational plan for a streetcar is subject to approval by the California Public Utilities Commission, which may require this practice if it feels public safety is at issue. However, it has been common practice in California that streetcars operating in mixed traffic may be required to sound a bell when beginning to move (e.g. pulling away from a stop) but generally not when crossing through an intersection, as the streetcar is simply moving with traffic.

Local Policy Support

To be successful and have the support of the local communities and districts, the streetcar needs to comply with the local policy documents and growth and development strategies. Relevant Community Plans and redevelopment strategies were reviewed for the downtown area and it was determined that all concepts are supportive of existing local policies for redevelopment.

Designated Improvement or Redevelopment Areas

The streetcar is seen by many local businesses, stakeholders and elected officials as a downtown economic development tool. As such, it is important that the streetcar provides service to established improvement areas. There are five designated redevelopment project areas within the study area that include City Center, Central Business District, Bunker Hill, Little Tokyo, and Chinatown. There are also seven Business Improvement Districts (BIDs): Downtown Center, Fashion District, Historic Downtown, South Park, Toy District, Downtown Industrial, and Little Tokyo

Each of the alignments serves multiple redevelopment project areas, with most serving a minimum of three. Concept 3 however serves the fewest redevelopment project areas serving only the City Center and Central Business District.

In terms of BID service, all five Concepts serve the South Park BID, and all but Concept 4 serves Downtown Center and Historic Downtown. Concept 4 serves the Fashion and Toy Districts. Little Tokyo is served by Concepts 3 and 4.

9.0 POTENTIAL FUNDING SOURCES

This chapter provides a summary of a peer review conducted on the funding sources used by other agencies in cities across the country to construct and operate similar local streetcar services proposed in downtown Los Angeles, as well as present suggestions of possible sources to consider for constructing and operating a local streetcar system. Using the sources identified by the peer reviews as a template, this section concludes by identifying potential similar sources of funding available in Southern California.

9.1 FINANCIAL OVERVIEW OF SELECTED STREETCAR SYSTEMS

This section summarizes information obtained on capital and operating cost sources from the financial peer review that was conducted on six similar historic trolley and streetcar operations across the United States. Capital costs are reported in the year of construction to facilitate comparison. Costs have been inflated to February 2006 dollars using the McGraw-Hill Engineering News Record Construction Cost Index. Several charts illustrating the comparison between these systems are provided in **Appendix B**.

Downtown Portland Streetcars

The original segment of the system, which opened in 2001 between Good Samaritan and Portland State University, is 2.4 miles of double track and had a capital cost of $56.9 million (2006: $67 million), which was funded by City parking bonds, the local improvement district, tax increment, Federal transportation funds, City parking and general funds. Operating expenses for fiscal year 2004 totaled $2.7 million. $1.6 million of this cost was funded by Tri-Met, while the remaining was paid for by parking meter revenues ($800K) and sponsorships, fares and promotions ($300K).

The second segment of the system, which opened in March 2005, travels between Portland State University and RiverPlace, and is 0.6 miles of double track. This segment had a capital cost of $16 million which was funded by tax increment, a transportation land sale, the local improvement district, a Federal HUD grant, local transportation, and miscellaneous funds. Operating expenses for the first year should cost an additional $600K. $400K of this additional cost is funded by Tri-Met, while the remaining is paid by parking meter revenues ($150K), sponsorships, fares, and promotions ($50K).

San Francisco F-Line

The combined capital cost of both the Market Street and Embarcadero Lines totaled $79 million (2006: $104 million). This cost does not include the Federal grants awarded for the restoration of the historic streetcars. Of the $79 million, two thirds of the cost was obtained from state transportation and redevelopment funds, much of which were part of the redevelopment funds for the Embarcadero following the collapse of the Embarcadero freeway in 1989, the remaining one third of the funding came from local transportation funds.

Tampa TECO Line

Total cost for the 2.4 miles of track, vehicles, and stations was approximately $32 million (2006: $37 million). Related structures and property purchases raised the overall cost to $56 million (2006: $65 million). The construction of the system was a joint venture between the City of Tampa and the Hillsborough Area Regional Transit Authority and was financed by the Federal Transit Administration, the State of Florida Department of Transportation, and the City of Tampa. Operations are currently financed through an endowment fund, fare revenue, advertising revenue, and a special non-ad valorem special assessment district. The first year of operation was also financed by a Congestion Mitigation Air Quality (CMAQ) grant.

San Pedro Waterfront

The Waterfront Red Car Line was built by the Port of Los Angeles, which also owns the land and related facilities. Port employees built the line's four stations and performed the majority of work on the three railcars. The total cost of the initial phase of the project, including the three railcars, was $10 million (2006: $11.4 million). This cost covered several CPUC and FRA regulations that needed to be met given the service would operate along an existing freight corridor and would have to cross several at-grade crossings. The funding for the project came from Harbor Revenue Fund, which is derived solely from the shipping revenues collected by the Port.

Dallas McKinney Avenue Line

The original capital cost to construct the system was $6.3 million in 1979 (2006: $15 million). Of this, $3.8 million was from donations, with $2.5 million in grants from the Urban Mass Transit Administration (UMTA, now the FTA). The trolley system is operated with vintage equipment to capitalize on the nostalgic sentiment of the neighborhood. There is no fare; the rides are free. The current operating cost is $630K per year, comprised of public improvement district ($150K), Dallas Area Rapid Transit, DART, ($326K) and the remainder from private donation, foundation grants, and advertisement revenue.

Seattle Waterfront

The initial segment of the George Benson waterfront streetcar line had a capital cost of $3.5 million (2006: $6 million), financed from King County Metro Transit ($1.2 Million), a local improvement district ($1.2 million) and UMTA (FTA) grants. The 1990 expansion had a capital cost of $6.5 Million (2006: $9.3 million), funded 100% by King County Metro Transit. The fare is $1. Operations are funded by Metro.

9.2 LOS ANGELES DOWNTOWN STREETCAR FUNDING OPPORTUNITIES

The proposed Los Angeles streetcar would qualify for a variety of transit funds, but, based on streetcar systems elsewhere in the United States, the streetcar could also qualify for private and assessment district funding. The following are some examples of funding for the Los Angeles "Red Car Trolley" project

9.2.1 LESSONS LEARNED FROM EXISTING U.S. STREET CAR TROLLEY SYSTEMS

In formulating a funding strategy for implementing a Los Angeles streetcar service, it is important to learn from other systems. Existing streetcar systems in the U.S.:

- Do not rely on traditional state and federal transportation funds;
- Use funding sources related to local improvement districts, redevelopment and parking fees;
- Seek volunteer labor and donations from the private sector; and
- Receive funding from the regional transit agency and local government.

As the funding strategy for the Los Angeles streetcar is developed, these key factors will need to be considered in securing capital and operating funds.

9.2.2 ESTIMATED COSTS OF STREETCAR

The capital costs for the streetcar concepts are estimated from $59.8 for Concept 1 to $72.8 million for Concept 5. These costs are dependent on the alignment, number of vehicles, availability of right-of-way and other factors.

The operating costs can range between $3.9 million and $4.7 million per year or possibly higher, depending on the final alignment chosen. Subsequent phases of the project will refine these costs.

9.2.3 POTENTIAL FUNDING SOURCES FOR A LOS ANGELES STREETCAR

The following sections discuss capital and operating funding options for the downtown streetcar. These funds are categorized into four categories:

- Local/Regional
- State
- Federal
- Private

Based upon the information below, a specific funding strategy would be developed in subsequent phases of this project.

Local/Regional Funding

Depending on which agency or organization builds and operates the streetcar system, there is a variety of local/regional capital and operating funds available for the project.

Potential local/regional sources include:

- The City of Los Angeles transportation funds
  - Proposition A or C sales tax revenues;
  - Discretionary city transportation funds; and/or
  - Community Redevelopment funds.
- Local Fees
  - Parking Bonds
  - Parking Meter Revenue
  - Public Transportation Land Sales
- Farebox revenues (for operations only)
- Promotions and Advertisement (for operations only)
- Los Angles County Metropolitan Transportation Authority (Metro) funding
  - Congestion Mitigation and Air Quality (CMAQ) funds
  - Proposition C 25% transit-related highway funds
  - Transportation Environmental Enhancement funding
  - Metro transit formula funding – Prop. C 40% funding (only if Metro operates the streetcar system)

State Funds

It is unlikely that near term State Transportation Improvement Program (STIP) funds would be available for this project, given the lack of funding for new projects in the 2006 STIP. There may be some

opportunities in the 2008 STIP as the California economy improves and funds are restored to transportation accounts.

If the proposed state infrastructure bond were to be put in the November 2006 ballot, then there would be an opportunity for this project to compete for new state funding.

Potential State funds include (capital funds only):

- State Transportation Improvement Program (STIP) funds
  - Federal formula funds programmed by the state
  - State Public Transit Fund programs
- State Infrastructure Bond (2006 voter approval required)

Federal Funds

Federal grants are available to fund a portion of the capital costs of the streetcar project.

Potential federal sources include:

- Federal Transit Administration Discretionary Funding
  - New Small Starts Funding effort for trolley and streetcar systems
  - Annual federal appropriations
- Other federal agency funding, such as Housing and Urban Development (HUD)

Private Sector

Based on the success of other streetcar systems, private funding offers the best potential for funding a large part of the capital and operating costs of the Los Angeles streetcar project.

Potential private sources are listed and described below:

- Private Donations
- Volunteer Help
- Development, Redevelopment and Business Fees
  - Development Impact Fees
  - Tax Increment Financing
  - Business Improvement District funding
- Public/Private Partnerships
  - Joint Development

Private Donations/Volunteer Help: Several of the streetcar systems through the country seek out volunteer labor and donations from the private sector. They also have private support boards and groups to help generate funding and support for the system.

Development, Redevelopment and Business Impact Fees: Development impact fees are one-time charges against new development to raise new revenue for new or expanded public facilities necessitated by new development. Development impact fees emerged as a local financing technique for public facilities in the 1970s and 1980s when state and federal funding for local infrastructure improvements was declining yet the need for public facilities continued to grow.

Development impact fees should comply with the rational nexus test, which requires, in general, that that there is a connection established between new development and the new or expanded facilities required to accommodate such development.

Redevelopment tax increment financing from the City of Los Angeles Community Redevelopment Agency could be applied to this project, as well. However, funding would be extremely limited from the City Center Redevelopment Project.

Business Improvement Districts (BID's) exist within Downtown Los Angeles for a variety of purposes. A new or re-authorized BID could contribute to the streetcar project as well as other transportation improvements in the downtown area.

Benefit Assessment District Programs: In California, local governments can assess local properties to finance the provision of public services, including transportation. State law prescribes a process for setting up benefit assessment districts that includes studies and reports, notification of property owners and a process to solicit and consider public comment. A vote of the affected property owners is often required, and assessments are added to annual property tax bills. The process provides for opposition to the assessment, and power rests with property owners to block a proposed district.

Public Private Partnerships & Joint or Transit Oriented Development: Public/private partnerships are a way to infuse private equity into a public infrastructure project. In order to attract private investment, a revenue stream must be generated or paid to the developer as a reasonable return on its investment. These revenue streams are more difficult for a transit project, since the fare charged rarely fully covers the operating costs, unlike a toll road facility.

Joint development allows transit agencies to realize benefits from their ownership of real property. Many transit properties, especially rail operators, own parcels related to the construction and/or operation of their systems. Construction staging areas, surplus right-of-way, station areas, and park and ride lots are prime candidates for joint development. These partnerships between the public agency and a private developer result in benefits to both parties, i.e. a profit for the private developer and a cash payment or long-term income stream for the transit agency. This technique may be appropriate for the streetcar maintenance yard.

Infrastructure funding needs for transit-oriented development can often be achieved by using tax increment and/or benefit assessment type financing structures. The future value of property appreciation and incremental property taxes, or benefits to property owners from new and/or improved rail, road, and utility services provides the revenue needed to service debt for the infrastructure improvements.

10.0 NEXT STEPS

This report has proven the feasibility of resurrecting a streetcar service in downtown Los Angeles. To conclude, this chapter presents the next steps that will be required to design and construct a resurrected streetcar system and put it into operation, and to realize the redevelopment potential envisioned in the local policies and transportation vision outlined in this report.

10.1 PROJECT IMPLEMENTATION OVERVIEW

The next steps in the process of resurrecting downtown streetcar services would be to complete the environmental review and obtain the necessary environmental clearances that are required before a decision can be made to construct the streetcar system. Completion of the environmental review and the preparations of the appropriate state and/or federal documentation will require additional planning and engineering analyses. These pre-deployment studies will build upon this initial feasibility analysis and address specific technical issues. Among the technical issues to be addressed are the following:

- Comparative analysis of alignment alternatives
- Alignment design and engineering concepts
- Stop location options and design concepts
- Operating scenarios, including interaction with existing and proposed transit services
- Location and design of maintenance facility
- Capital and operating cost analyses
- Safety and security analyses
- Impact analysis
- Financial analyses and assessment of alternate financing strategies
- Deployment strategies, including institutional and procurement options
- Traffic impact analyses, including analysis of interaction of streetcars with automobiles

This is not an exhaustive list but intended to indicate the scope of work yet to be done prior to final decisions being made to resurrect the downtown Los Angeles streetcar service.

10.2 PHASE II NEXT STEPS

As an interim step to the formal environmental review, it is recommended that a Project Definition Study be conducted to refine the data and results of the feasibility analysis and develop conceptual designs and a funding strategy that can help streamline the environmental process. This phase of the process can be used to further the public outreach efforts of the project, by taking the project to the neighborhood councils, agency boards, city council and private developers to help sell the project and obtain broad community support, which in turn will help in opening up a broad range of funding opportunities for conducting the environmental review.

The steps recommended for the project definition phase should involve:

- Developing a Funding Plan with a four step strategy that includes:
  - Funding Source Strategy
  - Informational Materials
  - Funding Agency Strategy
  - Legislative Strategy
- Develop an Institutional Plan (who will operate and maintain the system?) Examples of options include:
  - Separate Joint Powers Authority (JPA)
  - Integrated into regional transit agency (e.g. Metro)
  - City Department or sub-department within LADOT
- Perform a system planning analysis, that includes:
  - Identifying and discussing technology options
  - Refining alignment options and stop locations
  - Conducting a detailed ridership analysis
  - Conducting a high-level environmental and traffic impact analysis to identify the most prominent impacts that might be expected
  - Perform a fatal flaw analysis of alternatives to narrow the number of alignment alternatives for the environmental review
- Conducting conceptual engineering that includes:
  - Developing conceptual engineering designs, such as:
    a. *Determining track requirements and gauge*
    b. *Identifying system requirements based on technology options determined*
    c. *Developing conceptual stop designs*
    d. *Developing conceptual maintenance and storage facility designs*
  - Refining cost estimates, both capital and operating
  - Determining operational parameters (how might the system operate on the street?)
- Expanding Public and Stakeholder Outreach, to include:
  - Furthering discussions with elected officials
  - Keeping up-to-date members of the Red Car Advisory Committee and involving committee members in making presentations to downtown stakeholders
  - Maintaining communication and cooperation with Metro and LADOT
  - Involving downtown residents and businesses in the process through discussions and presentations with the downtown neighborhood councils and business improvement districts
  - Encouraging discussion of the project on downtown-related blogs and websites.

10.3 CONCLUSION

The success of the streetcar project will hinge on the level and extent of demonstrated support of elected officials, community organizations, and local agencies. To that extent, neighborhood councils and business improvement districts should obtain strong resolutions of support from their communities, which all stand to benefit from the implementation of a downtown streetcar. Additional showings of support need to be made by the City Council, the Metro Board of Directors and other local agencies and state and federal local officials. This galvanized action-oriented support will strengthen the ability of this project to not only compete for funding at the local, state and federal level, but may encourage additional private investment by downtown businesses and real estate companies who may benefit from the reintroduction of streetcar services in downtown Los Angeles.

Appendix A
Estimated Travel Times

Appendix B
Peer Review of Potential Funding Sources

Appendix A.1: Travel Times for Alternative 1 (Northbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Average Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Olympic/Broadway		**STN**			0	0	-	
11th/Broadway	660	**STN**	1.4	5.5	660	1.4	1.4	5.9%
12th/Broadway	660	SGN	0.5	14.3	1,320	1.9		
Pico/Broadway	465	SGN	0.4	12.9	1,785	2.3		
Pico/Broadway	80	**STN**	0.5	1.9	1,865	2.8	1.4	6.1%
Hill/Pico	281	SGN	0.4	7.6	2,146	3.2		
Midway/Pico	206	SGN	0.1	16.2	2,352	3.3		
E. Olive/Pico	91	SGN	0.0	24.9	2,443	3.4		
W. Olive/Pico	116	SGN	0.2	6.6	2,559	3.6		
W. Olive/Pico	80	**STN**	0.4	2.1	2,639	4.0	1.2	5.4%
Margo/Pico	118	SGN	0.1	10.2	2,757	4.1		
Grand/Pico	190	SGN	0.2	9.2	2,946	4.4		
Hope/Pico	454	SGN	0.4	12.7	3,400	4.8		
Hope/Pico	80	**STN**	0.5	1.9	3,480	5.3	1.2	5.4%
12th/Hope	536	SGN	0.7	9.4	4,016	5.9		
11th/Hope	660	SGN	0.5	15.0	4,676	6.4		
11th/Hope	80	**STN**	0.5	1.9	4,756	6.9	1.6	7.0%
Olympic/Hope	580	SGN	0.5	13.5	5,336	7.4		
9th/Hope	660	SGN	0.5	15.0	5,996	7.9		
9th/Hope	80	**STN**	0.5	1.9	6,076	8.3	1.5	6.3%
8th/Hope	580	SGN	0.5	13.5	6,656	8.8		
7th/Hope	660	SGN	0.5	15.0	7,316	9.3		
7th/Hope	80	**STN**	0.5	1.9	7,396	9.8	1.5	6.3%
Grand/7th	335	SGN	0.5	8.1	7,731	10.3		
Olive/7th	415	SGN	0.4	12.2	8,146	10.6		
Olive/7th	80	**STN**	0.5	1.9	8,226	11.1	1.3	5.7%
Hill/7th	335	SGN	0.4	10.1	8,561	11.5		
Broadway/7th	415	SGN	0.4	12.2	8,976	11.9		
Broadway/7th	80	**STN**	0.5	1.9	9,056	12.3	1.2	5.3%
6th/Broadway	580	SGN	0.7	9.5	9,636	13.0		
5th/Broadway	660	SGN	0.5	15.0	10,296	13.5		
5th/Broadway	80	**STN**	0.5	1.9	10,376	14.0	1.7	7.2%
4th/Broadway	580	SGN	0.5	13.5	10,956	14.5		
3rd/Broadway	660	SGN	0.5	15.0	11,616	15.0		
3rd/Broadway	80	**STN**	0.5	1.9	11,696	15.5	1.5	6.3%
2nd/Broadway	580	SGN	0.5	13.5	12,276	15.9		
1st/Broadway	660	SGN	0.5	15.0	12,936	16.4		
1st/Broadway	80	**STN**	0.5	1.9	13,016	16.9	1.5	6.3%
Hill/1st	335	SGN	0.5	8.1	13,351	17.4		
Olive/1st	415	SGN	0.4	12.2	13,766	17.8		
Olive/1st	80	**STN**	0.5	1.9	13,846	18.2	1.3	5.7%
Grand/1st	345	SGN	0.4	10.3	14,191	18.6		
1st/Hope	415	SGN	0.4	12.2	14,606	19.0		
1st/Hope	80	**STN**	0.5	1.9	14,686	19.5	1.2	5.4%
Connector/Hope	637	SGN	0.5	14.1	15,323	20.0		
Gen. Thad Pkwy/Hope	236	SGN	0.3	8.8	15,559	20.3		
3rd/Hope	390	SGN	0.4	11.8	15,949	20.7		
3rd/Hope	80	**STN**	0.5	1.9	16,029	21.1	1.7	7.2%
333 Hope Building Park	270	**SGN**	0.3	8.8	16,299	21.5		
333 Hope Building Park	80	**STN**	0.5	1.9	16,379	22.0	0.8	3.6%
WB4th/Hope	166	SGN	0.3	6.4	16,545	22.3		
EB4th/Hope	115	SGN	0.3	5.2	16,660	22.5		
Hope Place/Hope St	257	**STN**	0.6	5.1	16,918	23.1	1.1	4.9%

Appendix A.2: Travel Times for Alternative 2 (Clockwise)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Average Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
11th/Figueroa		**STN**			0	0	-	
Olympic/Figueroa	610	SGN	0.5	14.5	610	0.5		
Olympic/Flower	415	SGN	0.4	12.6	1,025	0.9		
Olympic/Flower	80	**STN**	0.5	1.9	1,105	1.3	1.3	6.4%
9th/Flower	580	SGN	0.5	14.1	1,685	1.8		
9th/Flower	80	**STN**	0.5	1.9	1,765	2.3	0.9	4.6%
8th/Flower	560	SGN	0.5	13.8	2,325	2.7		
7th/Flower/Metro Station	660	SGN	0.5	16.2	2,985	3.2		
7th/Flower/Metro Station	80	**STN**	0.5	1.9	3,065	3.6	1.4	6.8%
Wilshire/Flower	220	SGN	0.3	7.7	3,285	4.0		
6th/Flower	340	SGN	0.3	11.2	3,625	4.3		
5th/Flower	690	SGN	0.5	16.5	4,315	4.8		
5th/Flower	80	**STN**	0.5	1.9	4,395	5.3	1.6	7.9%
4th/Flower	580	SGN	0.5	14.1	4,975	5.7		
3rd/Flower	660	SGN	0.5	16.2	5,635	6.2		
3rd/Flower	80	**STN**	0.5	1.9	5,715	6.7	1.4	6.8%
1st/Flower	1,280	SGN	0.7	20.1	6,995	7.4		
1st/Flower	80	**STN**	0.5	1.9	7,075	7.9	1.2	5.8%
Grand/1st	335	SGN	0.4	10.1	7,410	8.2		
Olive/1st	425	SGN	0.4	12.8	7,835	8.6		
Olive/1st	80	**STN**	0.5	1.9	7,915	9.1	1.2	6.0%
Hill/1st	335	SGN	0.4	10.1	8,250	9.5		
1st/Broadway	415	SGN	0.4	12.6	8,665	9.8		
1st/Broadway	80	**STN**	0.5	1.9	8,745	10.3	1.2	5.9%
2nd/Broadway	490	SGN	0.4	12.8	9,235	10.7		
3rd/Broadway	660	SGN	0.5	16.2	9,895	11.2		
3rd/Broadway	80	**STN**	0.5	1.9	9,975	11.7	1.4	6.7%
4th/Broadway	580	SGN	0.5	14.1	10,555	12.1		
5th/Broadway	660	SGN	0.5	16.2	11,215	12.6		
5th/Broadway	80	**STN**	0.5	1.9	11,295	13.1	1.4	6.8%
6th/Broadway	580	SGN	0.5	14.1	11,875	13.5		
7th/Broadway	660	SGN	0.5	16.2	12,535	14.0		
7th/Broadway	80	**STN**	0.5	1.9	12,615	14.5	1.4	6.8%
8th/Broadway	580	SGN	0.5	14.1	13,195	14.9		
9th/Broadway	660	SGN	0.5	16.2	13,855	15.4		
9th/Broadway	80	**STN**	0.5	1.9	13,935	15.9	1.4	6.8%
Olympic/Broadway	580	SGN	0.5	14.1	14,515	16.3		
11th/Broadway	660	SGN	0.5	16.2	15,175	16.8		
11th/Broadway	80	**STN**	0.5	1.9	15,255	17.3	1.4	6.8%
Blackstone/11th	131	SGN	0.1	10.3	15,386	17.4		
Hill/11th	195	SGN	0.2	9.6	15,581	17.6		
Midway/11th	206	SGN	0.1	16.9	15,787	17.8		
Olive/11th	208	SGN	0.1	31.2	15,995	17.9		
Olive/11th	80	**STN**	0.5	2.0	16,075	18.3	1.0	5.1%
Grand/11th	338	SGN	0.4	10.1	16,413	18.7		
Hope/11th	415	SGN	0.4	12.6	16,828	19.1		
Hope/11th	80	**STN**	0.5	1.9	16,908	19.5	1.2	5.9%
Pembroke/11th	136	SGN	0.1	10.6	17,044	19.7		
Flower/11th	197	SGN	0.2	9.7	17,241	19.9		
Figueroa/11th	415	**STN**	0.6	7.4	17,656	20.5	1.0	4.9%

Appendix A.3: Travel Times for Alternative 3 (Northbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Average Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Figueroa/Olympic		**STN**			0	0	**-**	-
Flower/Olympic	415	SGN	0.4	11.4	415	0.4		
Pembroke/Olympic	197	SGN	0.2	11.9	612	0.6		
Hope/Olympic	216	SGN	0.3	8.3	828	0.9		
Hope/Olympic	80	**STN**	0.5	1.9	908	1.4	1.4	8.3%
Grand/Olympic	335	SGN	0.4	10.1	1,243	1.7		
Olive/Olympic	418	SGN	0.4	12.2	1,661	2.1		
Olive/Olympic	80	**STN**	0.5	1.9	1,741	2.6	1.2	7.5%
Midway/Olympic	128	SGN	0.2	8.4	1,869	2.8		
Hill/Olympic	206	SGN	0.3	8.0	2,075	3.1		
Blackstone/Olympic	195	SGN	0.2	11.9	2,270	3.3		
Broadway/Olympic	211	SGN	0.3	8.2	2,481	3.5		
Broadway/Olympic	80	**STN**	0.5	1.9	2,561	4.0	1.4	8.6%
9th/Broadway	580	SGN	0.5	13.5	3,141	4.5		
8th/Broadway	660	SGN	0.5	15.0	3,801	5.0		
8th/Broadway	80	**STN**	0.5	1.9	3,881	5.5	1.5	8.9%
7th/Broadway	580	SGN	0.5	13.5	4,461	6.0		
7th/Broadway	80	**STN**	0.5	1.9	4,541	6.4	1.0	5.8%
6th/Broadway	580	SGN	0.5	13.5	5,121	6.9		
5th/Broadway	660	SGN	0.5	15.0	5,781	7.4		
5th/Broadway	80	**STN**	0.5	1.9	5,861	7.9	1.5	8.9%
4th/Broadway	580	SGN	0.5	13.5	6,441	8.4		
3rd/Broadway	660	SGN	0.5	15.0	7,101	8.9		
3rd/Broadway	80	**STN**	0.5	1.9	7,181	9.3	1.5	8.9%
2nd/Broadway	580	SGN	0.5	13.5	7,761	9.8		
Spring/2nd	410	SGN	0.4	12.1	8,171	10.2		
Spring/2nd	80	**STN**	0.5	1.9	8,251	10.7	1.3	8.2%
Harlem/2nd	128	SGN	0.2	8.4	8,379	10.9		
Main/2nd	207	SGN	0.3	8.0	8,585	11.1		
Los Angeles/2nd	410	SGN	0.4	12.1	8,995	11.5		
Los Angeles/2nd	80	**STN**	0.5	1.9	9,075	12.0	1.3	8.0%
1st/Los Angeles	450	SGN	0.4	11.9	9,525	12.4		
City Hall	440	**STN**	0.7	7.6	9,965	13.1	1.1	6.6%
Temple/Los Angeles	395	SGN	0.4	11.1	10,360	13.5		
Federal Bulding	318	**STN**	0.6	6.0	10,678	14.1	1.0	6.1%
Aliso/Los Angeles	331	SGN	0.4	10.0	11,009	14.5		
Arcadia/Los Angeles	205	SGN	0.3	8.0	11,214	14.8		
101 On-ramp/Los Angeles	299	SGN	0.2	14.5	11,513	15.0		
El Pueblo	236	**STN**	0.6	4.8	11,749	15.6	1.5	8.9%
Alameda/Los Angeles	215	SGN	0.3	7.6	11,964	15.9		
Union Station	205	**STN**	0.5	4.2	12,169	16.4	0.9	5.3%

Appendix A.4: Travel Times for Alternative 3 (Southbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Avg Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Union Station	-	**STN**			0	0	**-**	-
Alameda/Los Angeles	205	SGN	0.3	6.7	205	0.3		
El Pueblo	204	**STN**	0.6	4.0	409	0.9	0.9	3.8%
101 On-ramp/Los Angeles	236	SGN	0.3	10.6	645	1.2		
Arcadia/Los Angeles	299	SGN	0.4	8.6	944	1.6		
Aliso/Los Angeles	205	SGN	0.3	6.9	1,149	1.9		
Federal Building	331	**STN**	0.7	5.4	1,480	2.6	1.7	7.0%
Temple/Los Angeles	318	SGN	0.5	8.0	1,798	3.1		
Main/Temple	345	SGN	0.5	8.5	2,143	3.5		
Main/Temple	80	**STN**	0.5	1.9	2,223	4.0	1.4	5.7%
Spring/Temple	335	SGN	0.5	8.1	2,558	4.5		
Broadway/Temple	415	SGN	0.5	8.9	2,973	5.0		
Broadway/Temple	80	**STN**	0.5	1.9	3,053	5.5	1.5	6.1%
Hill/Temple	320	SGN	0.5	8.0	3,373	5.9		
Grand/Temple	855	SGN	0.9	10.5	4,228	6.8		
Grand/Temple	80	**STN**	0.5	1.9	4,308	7.3	1.8	7.7%
Concert Hall/Music Center	520	**STN**	0.9	6.7	4,828	8.2	0.9	3.7%
Grand/1st	530	SGN	0.6	9.3	5,358	8.8		
Olive/1st	415	SGN	0.5	8.9	5,773	9.4		
Olive/1st	80	**STN**	0.5	1.9	5,853	9.8	1.6	6.8%
Hill/1st	330	SGN	0.5	8.1	6,183	10.3		
1st/Broadway	410	SGN	0.5	8.9	6,593	10.8		
1st/Broadway	80	**STN**	0.5	1.9	6,673	11.3	1.5	6.0%
2nd/Broadway	490	SGN	0.6	9.1	7,163	11.9		
3rd/Broadway	660	SGN	0.8	10.0	7,823	12.6		
3rd/Broadway	80	**STN**	0.5	1.9	7,903	13.1	1.8	7.6%
4th/Broadway	580	SGN	0.7	9.5	8,483	13.8		
5th/Broadway	650	SGN	0.7	10.0	9,133	14.5		
5th/Broadway	80	**STN**	0.5	1.9	9,213	15.0	1.9	7.9%
6th/Broadway	580	SGN	0.7	9.5	9,793	15.7		
7th/Broadway	660	SGN	0.8	10.0	10,453	16.4		
7th/Broadway	80	**STN**	0.5	1.9	10,533	16.9	1.9	7.9%
8th/Broadway	580	SGN	0.7	9.5	11,113	17.6		
8th/Broadway	80	**STN**	0.5	1.9	11,193	18.1	1.2	4.8%
9th/Broadway	580	SGN	0.7	9.5	11,773	18.8		
Olympic/Broadway	660	SGN	0.8	10.0	12,433	19.5		
Olympic/Broadway	80	**STN**	0.5	1.9	12,513	20.0	1.9	7.9%
Blackstone/Olympic	131	SGN	0.2	9.4	12,644	20.1		
Hill/Olympic	195	SGN	0.3	7.4	12,839	20.4		
Midway/Olympic	206	SGN	0.2	11.0	13,045	20.7		
Olive/Olympic	208	SGN	0.3	7.5	13,253	21.0		
Olive/Olympic	80	**STN**	0.5	1.9	13,333	21.4	1.5	6.0%
Grand/Olympic	338	SGN	0.5	8.2	13,671	21.9		
Hope/Olympic	415	SGN	0.5	8.9	14,086	22.4		
Hope/Olympic	80	**STN**	0.5	1.9	14,166	22.9	1.5	6.1%
Pembroke/Olympic	136	SGN	0.2	9.5	14,302	23.1		
Flower/Olympic	197	SGN	0.3	7.4	14,499	23.4		
Figueroa/Olympic	415	**STN**	0.8	6.1	14,914	24.1	1.2	5.1%

Appendix A.5: Travel Times for Alternative 4 (Northbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Average Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Convention Center	-	**STN**			0	0	**-**	-
Figueroa/12th	765	SGN	0.9	10.1	765	0.9		
Flower/12th	460	SGN	0.6	9.2	1,225	1.4		
Flower/12th	80	**STN**	0.5	1.9	1,305	1.9	1.9	8.1%
Flower/11th	570	SGN	0.7	9.5	1,875	2.6		
Pembroke/11th	422	SGN	0.4	11.7	2,297	3.0		
Hope/11th	418	SGN	0.5	9.5	2,715	3.5		
Hope/11th	80	**STN**	0.5	1.9	2,795	3.9	2.1	8.8%
11th/Grand	335	SGN	0.5	8.2	3,130	4.4		
11th/Grand	80	**STN**	0.5	1.9	3,210	4.9	0.9	4.0%
Grand/Olympic	590	SGN	0.7	9.6	3,800	5.6		
Olive/Olympic	418	SGN	0.5	9.0	4,218	6.1		
Midway/Olympic	208	SGN	0.2	11.0	4,426	6.3		
Hill/Olympic	206	SGN	0.3	7.6	4,632	6.6		
Hill/Olympic	80	**STN**	0.5	1.9	4,712	7.1	2.2	9.5%
Blackstone/Olympic	115	SGN	0.1	9.1	4,827	7.2		
Broadway/Olympic	211	SGN	0.3	7.6	5,038	7.6		
Broadway/Olympic	80	**STN**	0.5	1.9	5,118	8.0	0.9	4.0%
Main/Olympic	190	SGN	0.3	6.5	5,308	8.4		
Los Angeles/Olympic	414	SGN	0.5	9.0	5,722	8.9		
Los Angeles/Olympic	80	**STN**	0.5	1.9	5,802	9.3	1.3	5.7%
Santee/Olympic	288	SGN	0.4	7.7	6,090	9.8		
Olympic/Maple	355	SGN	0.5	8.6	6,445	10.2		
Olympic/Maple	80	**STN**	0.5	1.9	6,525	10.7	1.4	5.8%
9th/Maple	505	SGN	0.6	9.3	7,030	11.3		
Maple/8th	682	SGN	0.8	10.1	7,712	12.1		
Maple/8th	80	**STN**	0.5	1.9	7,792	12.6	1.9	7.9%
Santee/8th	162	SGN	0.3	6.0	7,954	12.9		
8th/Los Angeles	283	SGN	0.4	8.0	8,237	13.3		
7th/Los Angeles	754	SGN	0.8	10.3	8,991	14.1		
7th/Los Angeles	80	**STN**	0.5	1.9	9,071	14.6	2.0	8.6%
6th/Los Angeles	568	SGN	0.7	9.5	9,639	15.3		
5th/Los Angeles	691	SGN	0.8	10.1	10,330	16.0		
5th/Los Angeles	80	**STN**	0.5	1.9	10,410	16.5	1.9	8.2%
Winston/Los Angeles	204	SGN	0.3	6.7	10,614	16.8		
4th/Los Angeles	318	SGN	0.4	8.3	10,932	17.3		
Boyd/Los Angeles	330	SGN	0.3	11.5	11,262	17.6		
3rd/Los Angeles	311	SGN	0.4	8.7	11,573	18.0		
3rd/Los Angeles	80	**STN**	0.5	1.9	11,653	18.5	2.0	8.5%
2nd/Los Angeles	689	SGN	0.8	9.9	12,342	19.3		
Los Angeles/1st	527	SGN	0.6	9.6	12,869	19.9		
Los Angeles/1st	80	**STN**	0.5	1.9	12,949	20.4	1.9	8.1%
Onizuka/1st	116	SGN	0.1	9.1	13,065	20.5		
San Pedro/1st	419	SGN	0.5	9.5	13,484	21.0		
Central/First	690	SGN	0.8	10.1	14,174	21.8		
Central/First	80	**STN**	0.5	1.9	14,254	22.2	1.9	8.1%
1st/Alameda	220	SGN	0.4	6.9	14,474	22.6		
Metro Gold Line Station	390	**STN**	0.7	5.9	14,864	23.4	1.1	4.8%

Appendix A.6: Travel Times for Alternative 4 (Southbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Avg Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Metro Gold Line Station	-	**STN**			0	0	-	-
Alameda/Temple	380	SGN	0.5	8.5	380	0.5		
San Pedro/Temple	710	SGN	0.8	10.1	1,090	1.3		
Los Angeles/Temple	485	SGN	0.6	9.3	1,575	1.9		
Main/Temple	340	SGN	0.5	8.4	1,915	2.4		
Main/Temple	80	**STN**	0.5	1.9	1,995	2.8	2.8	10.9%
Temple/Spring	335	SGN	0.5	8.1	2,330	3.3		
City Hall	390	**STN**	0.7	5.9	2,720	4.0	1.2	4.7%
Spring/1st	495	SGN	0.6	9.2	3,215	4.7		
Main/1st	415	SGN	0.5	8.9	3,630	5.2		
1st/Los Angeles	400	SGN	0.5	8.9	4,030	5.7		
1st/Los Angeles	80	**STN**	0.5	1.9	4,110	6.2	2.1	8.2%
2nd/Los Angeles	447	SGN	0.6	8.9	4,557	6.7		
3rd/Los Angeles	769	SGN	0.8	10.3	5,326	7.6		
3rd/Los Angeles	80	**STN**	0.5	1.9	5,406	8.0	1.9	7.3%
Boyd/Los Angeles	231	SGN	0.2	10.5	5,637	8.3		
4th/Los Angeles	330	SGN	0.4	8.8	5,967	8.7		
Winston/Los Angeles	318	SGN	0.3	11.5	6,285	9.0		
5th/Los Angeles	284	SGN	0.4	8.4	6,569	9.4		
5th/Los Angeles	80	**STN**	0.5	1.9	6,649	9.9	1.8	7.1%
6th/Los Angeles	611	SGN	0.7	9.7	7,260	10.6		
7th/Los Angeles	648	SGN	0.7	10.0	7,908	11.3		
7th/Los Angeles	80	**STN**	0.5	1.9	7,988	11.8	1.9	7.5%
Los Angeles/8th	674	SGN	0.8	9.9	8,662	12.6		
Santee/8th	283	SGN	0.4	7.9	8,945	13.0		
8th/Maple	242	SGN	0.4	7.4	9,187	13.4		
8th/Maple	80	**STN**	0.5	1.9	9,267	13.8	2.0	7.8%
9th/Maple	602	SGN	0.7	9.6	9,869	14.5		
Maple/Olympic	585	SGN	0.7	9.7	10,454	15.2		
Maple/Olympic	80	**STN**	0.5	1.9	10,534	15.7	1.9	7.2%
Santee/Olympic	275	SGN	0.4	7.6	10,809	16.1		
Los Angeles/Olympic	368	SGN	0.5	8.6	11,177	16.6		
Los Angeles/Olympic	80	**STN**	0.5	1.9	11,257	17.1	1.4	5.3%
Main/Olympic	334	SGN	0.5	8.1	11,591	17.5		
Broadway/Olympic	270	SGN	0.4	7.8	11,861	17.9		
Broadway/Olympic	80	**STN**	0.5	1.9	11,941	18.4	1.3	5.1%
Blackstone/Olympic	131	SGN	0.2	9.4	12,072	18.5		
Hill/Olympic	195	SGN	0.3	7.4	12,267	18.8		
Hill/Olympic	80	**STN**	0.5	1.9	12,347	19.3	0.9	3.6%
Midway/Olympic	126	SGN	0.2	9.3	12,473	19.5		
Olive/Olympic	208	SGN	0.3	7.5	12,681	19.8		
Olympic/Grand	418	SGN	0.5	9.0	13,099	20.3		
Grand/11th	670	SGN	0.8	10.0	13,769	21.1		
Grand/11th	80	**STN**	0.5	1.9	13,849	21.5	2.2	8.6%
Hope/11th	335	SGN	0.5	8.1	14,184	22.0		
Hope/11th	80	**STN**	0.5	1.9	14,264	22.5	0.9	3.6%
Pembroke/11th	338	SGN	0.3	11.1	14,602	22.8		
11th/Flower	422	SGN	0.5	9.4	15,024	23.3		
Flower/12th	650	SGN	0.7	10.0	15,674	24.1		
Flower/12th	80	**STN**	0.5	1.9	15,754	24.5	2.1	8.0%
Figueroa/12th	380	SGN	0.5	8.5	16,134	25.0		
Convention Center	440	**STN**	0.8	6.3	16,574	25.8	1.3	5.0%

Appendix A.7: Travel Times for Alternative 5 (Northbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Average Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Convention Center	-	**STN**			0	0	-	-
Figueroa/12th	765	SGN	0.9	10.1	765	0.9		
Flower/12th	460	SGN	0.6	9.2	1,225	1.4		
Flower/12th	80	**STN**	0.5	1.9	1,305	1.9	1.9	6.5%
Flower/11th	570	SGN	0.7	9.5	1,875	2.6		
Pembroke/11th	422	SGN	0.4	11.7	2,297	3.0		
11th/Hope	415	SGN	0.5	9.4	2,712	3.5		
11th/Hope	80	**STN**	0.5	1.9	2,792	4.0	2.1	7.1%
Olympic/Hope	590	SGN	0.7	9.6	3,382	4.7		
9th/Hope	660	SGN	0.8	10.0	4,042	5.4		
9th/Hope	80	**STN**	0.5	1.9	4,122	5.9	1.9	6.6%
Grand/9th	335	SGN	0.5	8.1	4,457	6.3		
Olive/9th	415	SGN	0.5	8.9	4,872	6.9		
Olive/9th	80	**STN**	0.5	1.9	4,952	7.3	1.5	5.0%
Midway/9th	130	SGN	0.2	9.4	5,082	7.5		
9th/Hill	209	SGN	0.3	7.6	5,291	7.8		
9th/Hill	80	**STN**	0.5	1.9	5,371	8.3	0.9	3.2%
8th/Hill	590	SGN	0.7	9.6	5,961	9.0		
7th/Hill	664	SGN	0.8	10.0	6,625	9.7		
7th/Hill	80	**STN**	0.5	1.9	6,705	10.2	1.9	6.6%
Hill/6th	588	SGN	0.7	9.6	7,293	10.9		
Hill/6th	80	**STN**	0.5	1.9	7,373	11.4	1.2	4.0%
Lindley/6th	122	SGN	0.1	9.3	7,495	11.5		
Broadway/6th	210	SGN	0.3	7.6	7,704	11.8		
Frank/6th	201	SGN	0.2	11.0	7,905	12.0		
6th/Spring	203	SGN	0.3	7.5	8,108	12.3		
6th/Spring	80	**STN**	0.5	1.9	8,188	12.8	1.4	5.0%
5th/Spring	580	SGN	0.7	9.5	8,768	13.5		
4th/Spring	660	SGN	0.8	10.0	9,428	14.2		
4th/Spring	80	**STN**	0.5	1.9	9,508	14.7	1.9	6.6%
3rd/Spring	580	SGN	0.7	9.5	10,088	15.4		
2nd/Spring	660	SGN	0.8	10.0	10,748	16.2		
Spring/1st	570	SGN	0.7	9.7	11,318	16.8		
Spring/1st	80	**STN**	0.5	1.9	11,398	17.3	2.6	8.9%
Broadway/1st	335	SGN	0.5	8.1	11,733	17.8		
Broadway/1st	80	**STN**	0.5	1.9	11,813	18.2	0.9	3.2%
1st/Hill	335	SGN	0.5	8.1	12,148	18.7		
City Center Plaza	535	**STN**	0.9	6.9	12,683	19.6	1.3	4.6%
Hill/Temple	480	SGN	0.6	9.1	13,163	20.2		
Broadway/Temple	410	SGN	0.5	8.9	13,573	20.7		
Broadway/Temple	80	**STN**	0.5	1.9	13,653	21.2	1.6	5.5%
Spring/Temple	335	SGN	0.5	8.1	13,988	21.6		
Temple/Main	415	SGN	0.5	8.9	14,403	22.2		
Temple/Main	80	**STN**	0.5	1.9	14,483	22.6	1.5	5.0%
Aliso/Main	525	SGN	0.6	9.3	15,008	23.3		
Arcadia/Main	190	SGN	0.3	6.7	15,198	23.6		
El Pueblo	610	**STN**	1.0	7.3	15,808	24.5	1.9	6.6%
Cesar Chavez/Main	500	SGN	0.6	9.2	16,308	25.2		
Main/Alameda	415	SGN	0.5	8.9	16,723	25.7		
Ord/Alameda	170	SGN	0.3	6.4	16,893	26.0		
Main/Alameda	345	SGN	0.5	8.5	17,238	26.5		
Main/Alameda	80	**STN**	0.5	1.9	17,318	26.9	2.4	8.2%
Vignes/Alameda	380	SGN	0.5	8.5	17,698	27.4		
College/Alameda	700	SGN	0.8	10.1	18,398	28.2		
Metro Gold Line Station	450	**STN**	0.8	6.4	18,848	29.0	2.1	7.2%

Appendix A.8: Travel Times for Alternative 5 (Southbound)

Landmark/Intersection	Incremental Distance (ft)	Signal Station	Travel Time (min)	Avg Speed (mph)	Cummulative		Station to Station	
					Distance (ft)	Time (min)	Minutes	%
Metro Gold Line Station		**STN**			0	0	-	-
College/Alameda	450	SGN	0.6	8.9	450	0.6		
Vignes/Alameda	700	SGN	0.8	10.1	1,150	1.4		
Main/Alameda	460	SGN	0.4	11.8	1,610	1.8		
Main/Alameda	80	**STN**	0.4	2.1	1,690	2.2	2.2	8.0%
Ord/Alameda	265	SGN	0.4	7.5	1,955	2.6		
Main/Alameda	170	SGN	0.3	6.4	2,125	3.0		
Cesar Chavez/Main	415	SGN	0.5	8.9	2,540	3.5		
El Pueblo	500	**STN**	0.9	6.7	3,040	4.3	2.1	7.4%
Arcadia/Main	610	SGN	0.7	9.7	3,650	5.0		
Aliso/Main	190	SGN	0.3	6.7	3,840	5.4		
Temple/Main	605	SGN	0.7	9.8	4,445	6.1		
Temple/Main	80	**STN**	0.5	1.9	4,525	6.5	2.2	7.8%
Spring/Temple	335	SGN	0.5	8.1	4,860	7.0		
Broadway/Temple	415	SGN	0.5	8.9	5,275	7.5		
Broadway/Temple	80	**STN**	0.5	1.9	5,355	8.0	1.5	5.2%
Temple/Hill	330	SGN	0.5	8.1	5,685	8.5		
City Center Plaza	480	**STN**	0.8	6.6	6,165	9.3	1.3	4.6%
Hill/1st	535	SGN	0.6	9.4	6,700	9.9		
Broadway/1st	415	SGN	0.5	8.9	7,115	10.5		
Broadway/1st	80	**STN**	0.5	1.9	7,195	10.9	1.6	5.8%
1st/Spring	335	SGN	0.5	8.1	7,530	11.4		
1st/Spring	80	**STN**	0.5	1.9	7,610	11.9	0.9	3.3%
2nd/Spring	490	SGN	0.6	9.1	8,100	12.5		
3rd/Spring	660	SGN	0.8	10.0	8,760	13.2		
4th/Spring	660	SGN	0.8	10.0	9,420	14.0		
4th/Spring	80	**STN**	0.5	1.9	9,500	14.5	2.6	9.2%
Spring/5th	580	SGN	0.7	9.5	10,080	15.1		
Frank/5th	222	SGN	0.2	11.1	10,302	15.4		
Broadway/5th	200	SGN	0.3	7.4	10,502	15.7		
Broadway/5th	80	**STN**	0.5	1.9	10,582	16.1	1.7	6.0%
Lindley/5th	129	SGN	0.2	9.4	10,711	16.3		
5th/Hill	191	SGN	0.3	7.3	10,903	16.6		
6th/Hill	645	SGN	0.7	10.0	11,548	17.3		
6th/Hill	80	**STN**	0.5	1.9	11,628	17.8	1.7	5.9%
7th/Hill	590	SGN	0.7	9.6	12,218	18.5		
8th/Hill	660	SGN	0.8	10.0	12,878	19.3		
8th/Hill	80	**STN**	0.5	1.9	12,958	19.7	1.9	6.8%
Olive/8th	335	SGN	0.5	8.1	13,293	20.2		
Grand/8th	415	SGN	0.5	8.9	13,708	20.7		
Grand/8th	80	**STN**	0.5	1.9	13,788	21.2	1.5	5.2%
8th/Hope	335	SGN	0.5	8.1	14,123	21.6		
9th/Hope	670	SGN	0.8	10.0	14,793	22.4		
9th/Hope	80	**STN**	0.5	1.9	14,873	22.9	1.7	6.0%
Olympic/Hope	580	SGN	0.7	9.5	15,453	23.6		
11th/Hope	670	SGN	0.8	10.0	16,123	24.3		
11th/Hope	80	**STN**	0.5	1.9	16,203	24.8	1.9	6.8%
Pembroke/11th	335	SGN	0.3	11.1	16,538	25.1		
Flower/11th	422	SGN	0.5	9.4	16,960	25.6		
Flower/12th	650	SGN	0.7	10.0	17,610	26.4		
Flower/12th	80	**STN**	0.5	1.9	17,690	26.9	2.1	7.3%
Figueroa/12th	380	SGN	0.5	8.5	18,070	27.4		
Convention Center	440	**STN**	0.8	6.3	18,510	28.2	1.3	4.6%

CHART 1
SUMMARY - SELECTED U.S. STREETCAR SYSTEMS

	Portland Streetcars	San Francisco F - Line	Tampa Teco Line	San Pedro Waterfront	Dallas McKinney Ave	Seattle Waterfront
Year Built (Initial Phase)	2001	2000	2002	2003	1989	1982
Organization	Portland Tri-Met and Non-profit	San Francisco Municipal Railway, and Non-profit	Transit Agency (HART), City of Tampa, and Non-profit	Port of Los Angeles	McKinney Ave Transit Authority, DART, and Non-profit	King County Metro
Miles of Line	3.0	5.8	2.4	1.5	3.6	2.0
No. Stations	40 platform stops	Numerous street stops	12	4	Numerous street stops	9
No. Streetcar Vehicles	7 Skoda-Inekon cars	17 refurbed PCC cars and 10 'Peter Witt' cars	8 historic replica cars	2 new replica cars and 1 restored 1907 vintage car	4+ vintage cars (1909-1947)	5 double-ended Australian-built cars
Frequency of Stops	Every 13 minutes	Every 10 minutes	Every 20 minutes	Every 20 minutes	Every 15-20 minutes	Every 20 minutes
Initial Capital Cost *(In Current $Mils)*	$73	$79	$56	$10	$6	$10
Capital Cost Per Mile *(In Current $Mils)*	$24	$14	$23	$7	$2	$5
Annual Operating Cost *(In Recently Reported $Mils)*	$3.3	$19.2	$1.5	$1.6	$1.5	$1.3
Fares Range (Approx.)	Free - $1.40	Free - $1.25	$1.50	Free - $0.25	Free	Free-$1.50
Annual Ridership (Est.)	1,994,000	7,300,000	425,614	85,102	152,049	511,000
Operating Cost Per Boarding	$1.65	$2.63	$3.52	$18.80	$9.87	$2.54
Vehicle Advertising	N/A	Exterior Billboard	Exterior Billboard	N/A	Exterior Billboard	Exterior Billboard

Data Sources:

IBI Group (James Campbell)
Port of Los Angeles (Bob Henry)
Seattle-Post Intelligencer
King County Metro (http://transit.metrokc.gov)
Railwaypreservation.com
Community Streetcar Coalition
Hillsborough Area Regional Transit Authority
Market Street Railway (www.streetcar.org)

CHART 2

COMPARISON OF MUNICIPAL STREETCAR SYSTEM FUNDING SOURCES

CAPITAL COSTS - FUNDING SOURCES IN $ MILLIONS IN YEAR OF EXPENDITURE

	LOCAL									STATE	FEDERAL		PRIVATE	
STREETCAR SYSTEM	**PID/SA***	**Redevl**	**Tax Incr**	**Transit Agency****	**Harbor Port**	**Land Sale**	**Parking Bonds**	**Genl**	**Misc**		**FTA**	**HUD**	**Donations**	**TOTAL**
1. Downtown Streetcars														
Portland, OR (Tri-Met)														
2001 $'s ***Initial***	$ 9.6		$ 7.5	$ 1.7			$ 30.6	$ 1.8	$ 0.2		$ 5.0	$ 0.5		$ 56.9
2005 $'s ***Expansion 1***	3.0		8.4	0.6		$ 3.1			0.1			$ 0.8		16.0
2. F-Line Streetcars														
San Francisco, CA (MUNI)														
2000 $'s		52.7	***	26.3										79.0
3. TECO Line														
Tampa, FL (HART)														
2002 $'s				40.0							16.0			56.0
4. Waterfront Red Car Trolley														
San Pedro, CA (POLA)														
2003 $'s					$ 10.0									10.0
5. McKinney Ave Streetcars														
Dallas, TX (MATA)														
1989 $'s											2.5		$ 3.8	6.3
6. Waterfront Streetcar Line														
Seattle, WA (Metro)														
1982 $'s ***Initial***	$ 1.2			1.2							$ 1.2			3.6
Expansion 1				$ 6.5										$ 6.5

** Public improvement or special assessment district*

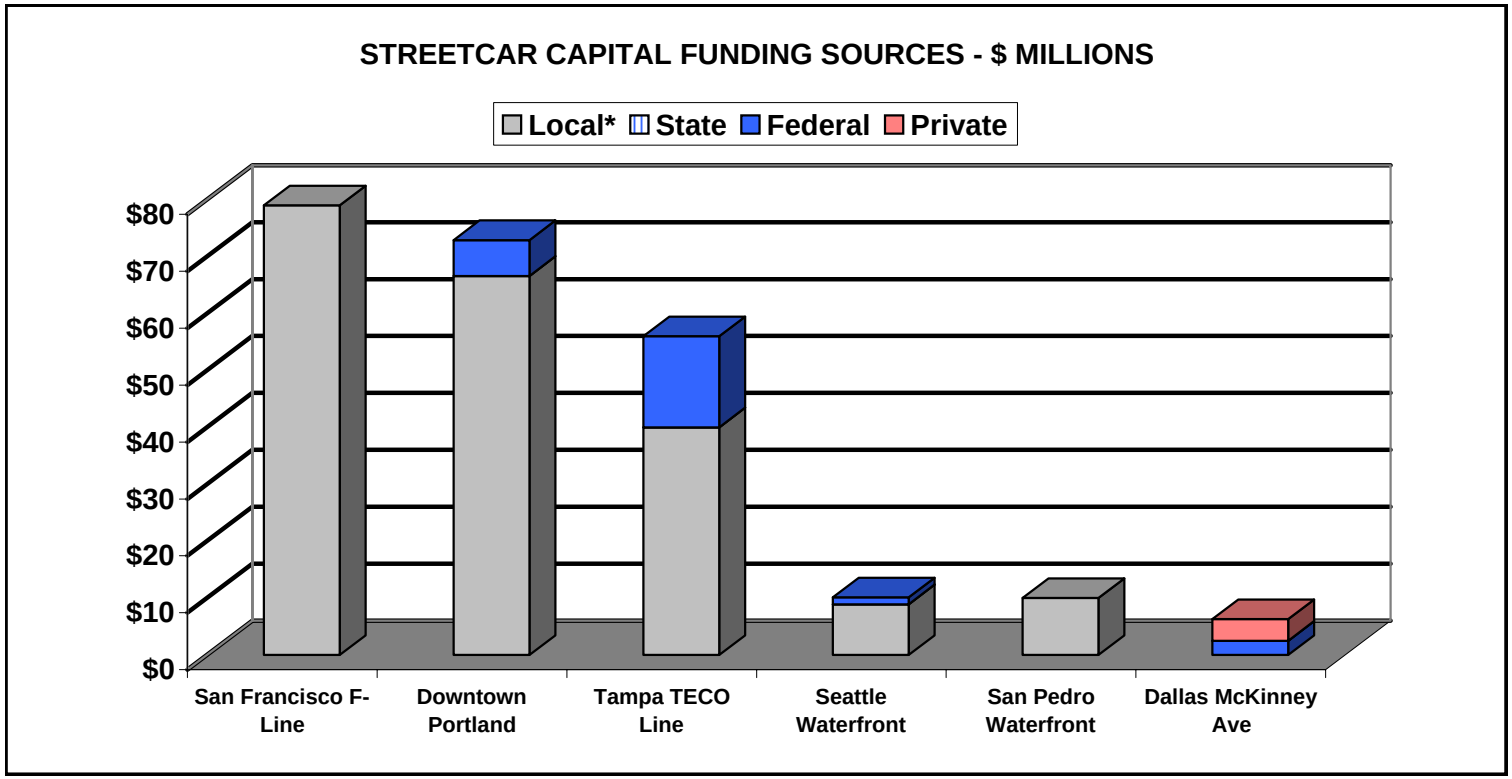
*** Transit Agency funding includes combination of Local/State/Federal funds*

**** Includes state transportation and redevelopment funds relating to removal of the Embarcadero freeway & development of the Embarcadero waterfront*

Data Sources:

IBI Group (James Campbell)
Port of Los Angeles (Bob Henry)
Seattle-Post Intelligencer
Hillsborough Area Regional Transit Authority
King County Metro (http://transit.metrokc.gov)
Railwaypreservation.com
Community Streetcar Coalition
Market Street Railway (www.streetcar.org)

CHART 3



$ in Millions	Local*	State	Federal	Private	TOTAL
San Francisco F-Line	$ 79.0				$ 79.0
Downtown Portland	66.6		6.3		72.9
Tampa TECO Line	40.0		16.0		56.0
Seattle Waterfront	8.9		1.2		10.1
San Pedro Waterfront	$ 10.0				10.0
Dallas McKinney Ave			$ 2.5	$ 3.8	$ 6.3

** Transit Agency funding includes combination of Local/State/Federal funds*

Data Sources:

IBI Group (James Campbell)
Port of Los Angeles (Bob Henry)
Seattle-Post Intelligencer
Hillsborough Area Regional Transit Authority
King County Metro (http://transit.metrokc.gov)
Railwaypreservation.com
Community Streetcar Coalition
Market Street Railway (www.streetcar.org)

CHART 4

COMPARISON OF MUNICIPAL STREETCAR SYSTEM FUNDING SOURCES

OPERATING COSTS - FUNDING SOURCES IN $ MILLIONS

	LOCAL					STATE	FEDERAL		PRIVATE	
STREETCAR SYSTEM	**PID/SA***	**Parking Meter**	**Transit Agency****	**Harbor Port**	**Fares/Promos**		**FTA**	**HUD**	**Donations**	**TOTAL**
1. Downtown Streetcars Portland, OR (Tri-Met)		$ 1.0	$ 2.0		$ 0.4					$ 3.3
2. F-Line Streetcars San Francisco, CA (MUNI)			19.2							19.2
3. TECO Line Tampa, FL (HART)	0.4			0.2	0.7	$ 0.1	$ 0.2			1.5
4. Waterfront Red Car Trolley San Pedro, CA (POLA)				$ 1.6						1.6
5. McKinney Ave Streetcars Dallas, TX (MATA)	1.0	0.3			0.2				***	1.5
6. Waterfront Streetcar Line Seattle, WA (Metro)			$ 1.3							$ 1.3

** Public improvement or special assessment district*

*** Transit Agency funding includes combination of Local/State/Federal funds*

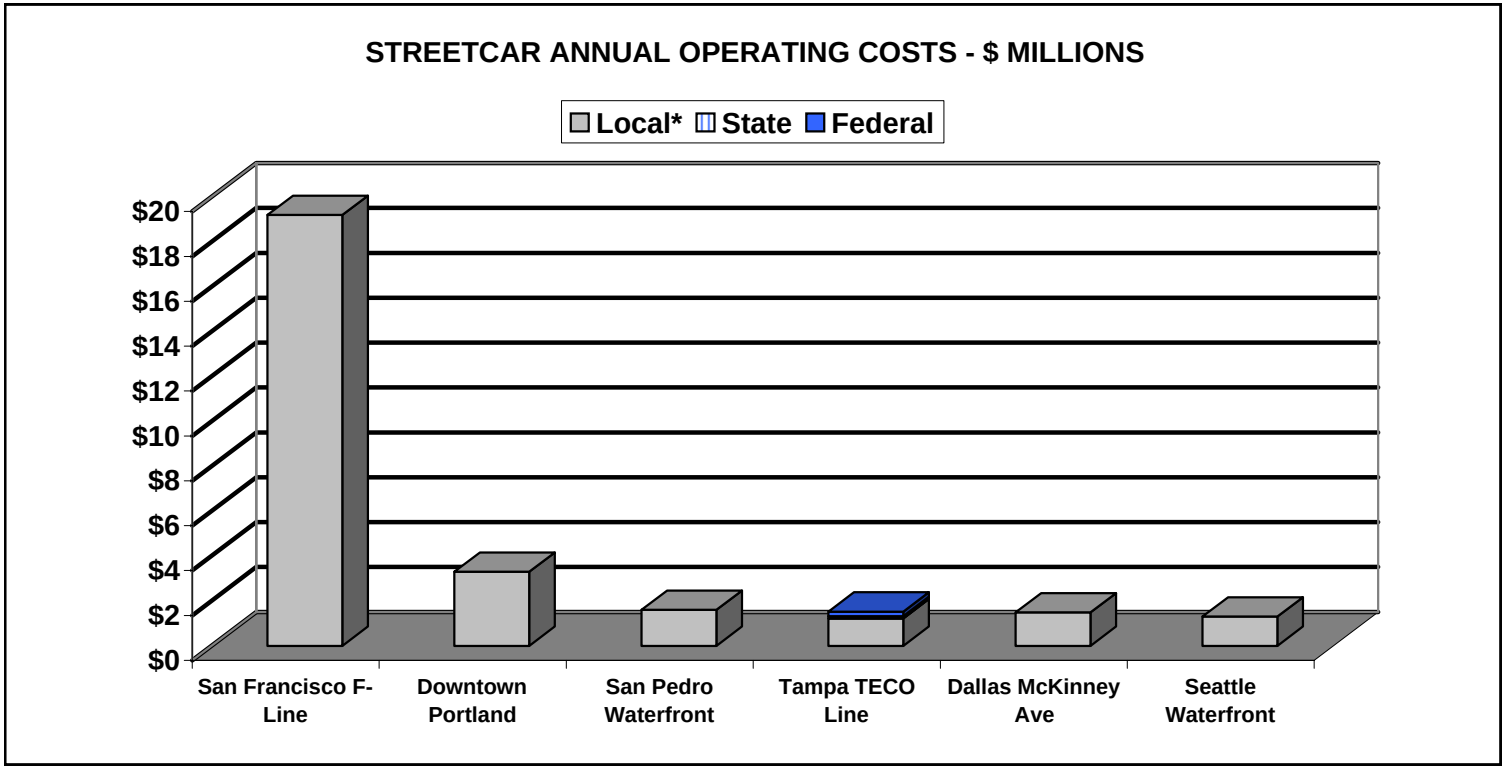
**** Includes some private donations*

Note: Volunteer work is not included in these costs

Data Sources:

IBI Group (James Campbell)	*King County Metro (http://transit.metrokc.gov)*
Port of Los Angeles (Bob Henry)	*Railwaypreservation.com*
Seattle-Post Intelligencer	*Community Streetcar Coalition*
Hillsborough Area Regional Transit Authority	*Market Street Railway (www.streetcar.org)*

CHART 5



$ in Millions	Local*	State	Federal	Private	TOTAL
San Francisco F-Line	$ 19.2				$ 19.2
Downtown Portland	3.3				3.3
San Pedro Waterfront	1.6				1.6
Tampa TECO Line	1.2	$ 0.1	$ 0.2		1.5
Dallas McKinney Ave	1.5				1.5
Seattle Waterfront	$ 1.3				$ 1.3

*** Transit Agency funding includes combination of Local/State/Federal funds*

Data Sources:

IBI Group (James Campbell)
Port of Los Angeles (Bob Henry)
Seattle-Post Intelligencer
Hillsborough Area Regional Transit Authority
King County Metro (http://transit.metrokc.gov)
Railwaypreservation.com
Community Streetcar Coalition
Market Street Railway (www.streetcar.org)