

EXECUTIVE SUMMARY

This report has been prepared for the Centre City Development Corporation (CCDC) in response to their desire to evaluate the potential operation of alternative Trolley (light rail) service in downtown San Diego. The objective of these operating plans would be to provide two-car Trolley service in the downtown core, while ensuring adequate capacity to meet rider demand. The evaluation was to measure the impact of these alternatives in terms of transit riders (capacity and demand), cost (operating and capital for new facilities) and other factors.

Six scenarios for the alternative operation of Trolley service were identified and evaluated. These scenarios provided several different approaches to the operation of two-car trains on the downtown (C Street and Park Boulevard) Trolley alignment. Several scenarios included an independent shuttle or loop service operating exclusively in the downtown area. Others included alternative approaches to the operation of the existing Blue and Orange lines.

Initial Screening

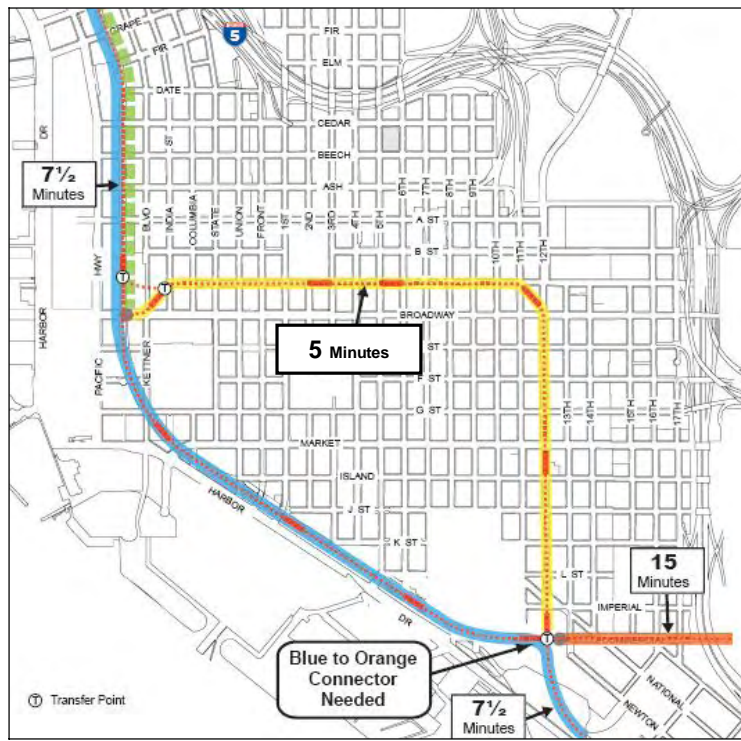
The six initial scenarios were evaluated in terms of several effectiveness criteria. Elements of the evaluation included:

- Service Frequency – Impact on traffic signals and gated crossings. The total number of trains and the frequency of trains were determined on both Bayside and on C and Park.
- Peak Trolley Requirements – Provided a preliminary assessment of the operating cost impacts, as well as the potential need for additional vehicles.
- Transfers – Percent of passengers arriving at 12th & Imperial who would have to transfer as compared to their current trip.
- Capacity – The capacity of the modified service to handle current riders was measured for the AM peak hour at 12th and Imperial
- Facility Improvements – Preliminary identification of the needed track and station improvements and a qualitative estimate of the capital costs

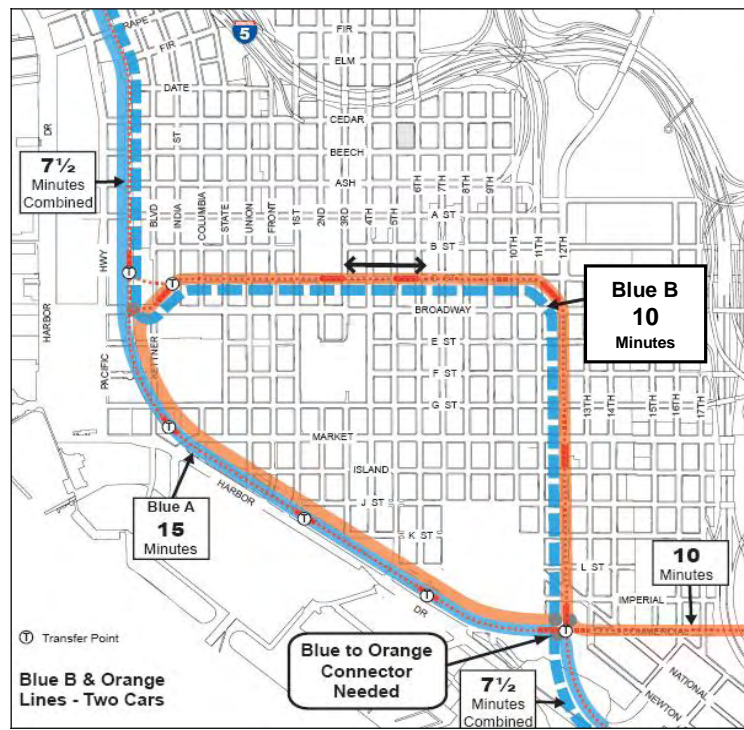
Based on the initial evaluation, two scenarios were preferred for additional evaluation. These were:

- Scenario C, providing a new, independent shuttle line in the downtown, with the Blue Line operating on Bayside and the Orange Line ending at 12th and Imperial.
- Scenario F, providing an alternative to current service, with half the Blue Line service operating on Bayside; The downtown (C and Park) routes would be operated with two-car trains, requiring more frequent Orange Line service.

Scenario C



Scenario F



To further assess these scenarios, the traffic impact of different levels of trolley service was evaluated to gauge the number of trolleys that can operate with the current traffic signal cycles. Key conclusions from this study included:

- Trolley service is constrained almost exclusively by the available traffic signal cycles, not the traffic level-of-service or intersection delays.
- On C Street and Park Boulevard, a potential level of service of one Trolley every 2.5 minutes each way can be operated (or 3.5 minutes if Trolleys cross Kettner to serve the Santa Fe Depot station).
- On the Bayside alignment, 5 minute frequency each way can be provided. This segment is constrained primarily by the intersections of Broadway and Pacific and Harbor and 5th.

Scenarios C and F were further evaluated in the following areas:

- Refined demand, capacity and transfer analysis
- Estimation of operating cost requirements.
- Development of required track and station modifications with order-of magnitude cost estimates.

Detailed Evaluation

The results from this additional evaluation reveal that both scenarios are feasible (to meet current demand), but do require new facilities, will increase operating expenses and will introduce operational issues that require further assessment in a “Design and Operations Plan” as discussed in the Next Steps section. The following summary addresses the effectiveness and impact of each scenario:

Scenario C

- With five minute peak shuttle frequency, this scenario can accommodate current peak and daily demand, but will require standees (about 30%) for peak hour, peak direction trips.
- The shuttle service will operate close to capacity, but can be expanded by increasing peak frequency, since C and Park can handle service operating as frequently as 3 ½ minutes (2 ½ minutes if the shuttle ends at America Plaza). More frequent service could increase capacity a minimum of 42%.
- The Blue Line operation on Bayside will operate at 7 ½ minute frequency, twice current service, but outside the identified 5 minute constraint.
- The estimated additional annual operating cost for Scenario C is \$1,780,000 (This estimate includes about \$2.6 million in added variable cost for the Shuttle offset by savings on the Blue and Orange lines).
- The station and track improvements needed for this scenario are substantial. They are primarily needed to provide an adequate terminus for the shuttle line at both

ends of the downtown, while maintaining sufficient capability to operate the existing Blue and Orange lines. The specific improvements include:

- A Blue Line to Orange (Bayside) track connection and an expanded two-sided station to allow the Blue Line to operate directly onto the Bayside alignment
- 12th and Imperial station expansion to create a new double-track terminal station for either the Orange Line or the shuttle service, and a new bus loading area (requiring acquisition of adjacent property).
- Santa Fe Depot modifications to create a third track for Trolley operations (providing a terminus for the shuttle). Alternatively, the shuttle terminal could be at America Plaza.
- While a significant number of passengers will need to transfer at 12th and Imperial, sufficient platform and walkway capacity exists to accommodate today's demand for transferring passengers, but crowded conditions will occur in the peak. Most of the 1890 peak hour transfers will be able to directly board a shuttle train, but about a third may have to wait for a second shuttle, or more likely will increase the load on the shuttle above the desired standard. A shuttle load of 150-200 per car (which is below the manufacturer standard of 236) will handle nearly all riders. In terms of future growth in demand, the shuttle could, and would need to, operate more frequently (say 2 to 4 minutes in the peak) to move riders from the 12th and Imperial platform on to the shuttle.

Scenario F

- This scenario eliminates the need for most passengers to transfer, since the Blue and Orange lines will continue to run through downtown. However, Blue Line passengers will need to select the correct downtown train, possibly requiring special branding and customer information.
- With 10 minute frequency on the Orange Line throughout the peak and 10 minute frequency on the Blue Line to C and Park in the peak hour (15 minutes otherwise in the peak), this scenario can accommodate current peak and daily demand, but will require standees (about 20%) for peak hour, peak direction trips.
- The downtown lines will operate close to peak hour capacity, but expansion of service is possible (greater frequency on C and Park can be accommodated). Further refinement of this scenario as discussed in the Next Steps will have to assess the entire Blue and/or Orange line operation for any operating issues, the need for capital improvements and additional operating costs, since service on the entire line may need to be expanded.
- Operation of the two legs of the Blue Line will introduce operation challenges to integrate the alternating trips and to balance the passenger loads.
- The Blue and Orange Line operation on Bayside will operate at a combined peak frequency of six minutes, very close to the identified maximum tolerable frequency of 5 minutes.

- The estimated additional annual operating cost for Scenario F is \$3,195,000 (due to increased Orange Line operations and added Blue Line peak service).
- The station and track improvements needed for this scenario are less substantial than Scenario C. They are primarily needed for the Blue Line connector to Bayside. The specific improvements include:
 - A Blue Line to Orange (Bayside) track connection and an expanded two-sided station to allow the Blue Line to operate directly onto the Bayside alignment
 - New turn-back and layover area for the Orange Line at 12th and Imperial in order to avoid conflicts with the Blue Line

Benefits of a Downtown Shuttle

The two scenarios offer two different approaches to the objective of shorter, possibly more frequent downtown Trolley service. However, Scenario F represents more of an interim, short term strategy, while Scenario C offers a more substantial change in service and operations. While there are issues that will need future attention, there are also benefits of a dedicated downtown shuttle, including:

- More reliable service, due to short route length
- Potential to use a specially branded downtown vehicle
- Greater downtown stakeholder buy-in and ownership; private/public financing potential
- Can be specifically designed for shorter trips within the downtown, including an increased number of stations
- Potential to consider an alternative vehicle, with more standing room and faster boarding, that can accommodate larger rider loads
- Frequency can be increased to support long-term growth of downtown transit ridership
- Can be better integrated with the urban fabric; downtown circulators are used in most downtowns/ centre cities.

In addition, the facility improvements and expansion envisioned for 12th and Imperial Station will have benefits for the long term, providing added capacity for both passengers and transit operations and establishing 12th and Imperial as a major transit entry point into the downtown.

Summary of Costs

The costs to implement these scenarios include both the cost of new vehicles and the cost of track and station improvements. Very preliminary, high-level estimates were developed for

these improvements in order to compare the alternatives. Substantial additional work is needed to refine the feasibility of these concepts and to develop more comprehensive and reliable cost estimates. A summary of these costs is provided below:

Scenario	Vehicles	Facilities	Total
C	\$27-48 million	\$52-60 million	\$79-108 million
F	\$15 million	\$28-30 million	\$43-45 million

Blue Line to Bayside connector cost = \$22-24 million

Community Plan (FEIR 2030) Growth and Ridership Projections

Both scenarios have constrained ability to meet the ridership projections of the 2030 FEIR Community Plan full build-out. Scenario C can be expanded with more frequent shuttle service to partly serve the demand. More frequent service may also be possible with Scenario F, but further evaluation is needed.

Future options that include supplemental circulators may be needed to distribute downtown passengers. Other cities have had success with systems such as special circulator buses and streetcars (as in Portland and Tacoma). One concept would be a north-south circulator that could serve core destinations, such as the Gaslamp area, and also relieve the transfer demand at 12th and Imperial.

Next Steps

Should either or both of these scenarios be further developed, more detailed investigation (through a Design and Operations Plan) would be needed in several areas, including:

- Refinement of the service plan and better understanding of the impact on riders
- Conceptual design of the track and station improvements
- Improved estimates of projected operating and capital costs
- Development of a strategy for branding and customer information

The potential to implement new service in a phased manner should also be further evaluated. Two elements, in particular, could have value for Trolley operation regardless of the future service plan. These are:

- The Blue Line to Bayside connector, allowing the Blue line to operate directly onto Bayside, which is part of both scenarios and provides operating flexibility for all future concepts.
- The acquisition of property just east of the 12th and Imperial station, in order to preserve the potential expansion of the station.