Metro Gold Line Extension Project Before-and-After Study (2013)

Los Angeles, California

U.S. Department of Transportation

Federal Transit Administration

Learn more:
www.transit.dot.gov/before-and-after-studies

Metro Gold Line Eastside Extension Project; Los Angeles, California

The project is a 6.0-mile light rail extension of the Metro Gold Line from Union Station in downtown Los Angeles through Little Tokyo to its terminus in East Los Angeles. The original 13.7 miles of the Gold Line opened in 2003 from Union Station to Pasadena. The extension was planned, developed, and built by the Los Angeles County Metropolitan Transportation Authority (Metro). The accompanying figure provides a map of the project and the corridor that it serves.

The project was originally conceived in the early 1990s as an extension of the Metro Red Line subway from its eastern terminus at Union Station. Financial constraints and a county-wide moratorium on subway construction led to the indefinite postponement of the project. A subsequent major investment study (MIS) reconsidered options for the corridor, focusing on light rail and bus rapid transit alternatives. Two light rail alternatives emerged from the MIS and, at the conclusion of the environmental process, Metro selected one as the project for implementation.

The project entered into preliminary engineering (PE) in October 2000, and into final design (FD) in October 2002. FTA and Metro executed a Full Funding Grant Agreement (FFGA) for the project in June 2004. The project opened to revenue service in November 2009.

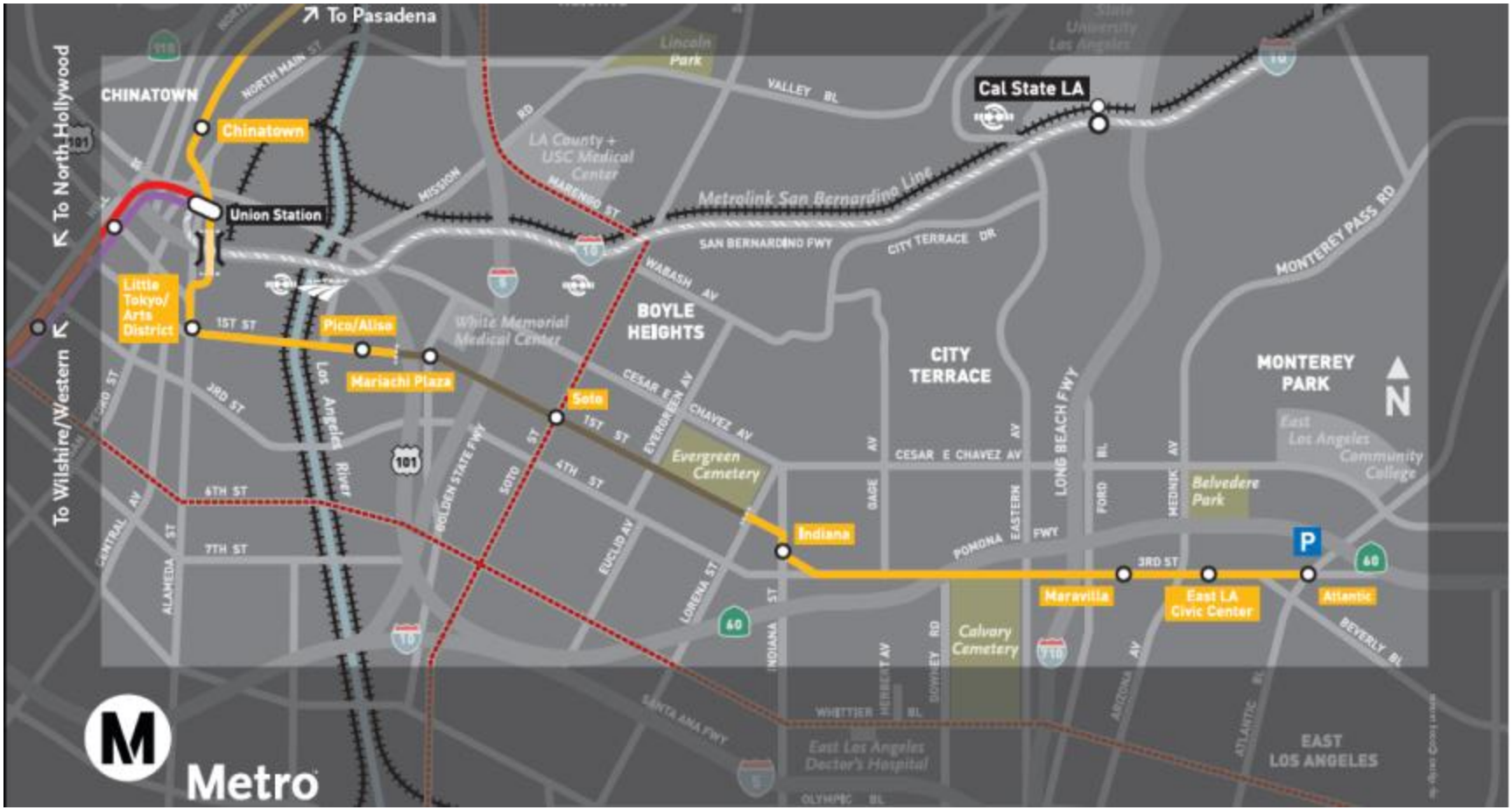
Physical scope of the project

Over its 6.0 miles, the project alignment includes 0.2 miles on an aerial bridge, 1.8 miles in twin sub-surface tunnels, and 4.0 miles in the center median of arterial streets where the tracks are embedded in pavement and separated from traffic by a raised curb. The project includes eight stations, two of which are underground. Stations can accommodate 3-car trains and have high platforms that permit level boarding over their entire length. Park-and-ride lots accompany the station on Indiana Street (41 spaces) and the terminal station at Atlantic (200 spaces). At the 24 street intersections on the alignment, the movements of trains, vehicles, and pedestrians are controlled by traffic signals, train signals, striping, and signage and trains have traffic-signal priority. The project included 10 articulated light rail vehicles and relies on additional vehicles from the existing Gold Line fleet to meet the operating requirement for fourteen vehicles on weekdays, plus spares. Trains operate with 2-car consists. Operating speeds are constrained to the speed limits applied to adjacent street traffic and may not exceed 35 mph.

The scope of the project emerging from the MIS accurately anticipated the as-built project in terms of its alignment, length, and mix of elevated, tunnel, and at-grade running. The modest adjustments made through the course of project development included two station relocations, the addition of the smaller park-and-ride lot at the Indiana station, the use of the existing Gold Line yard rather than the existing Red Line yard for vehicle maintenance and storage, the change from 25 to 10 light rail vehicles purchased as part of the project, and the reconfiguration of Ramona High School at its existing location rather than its relocation.

Capital cost

The actual cost of the project was $899.1 million in year-of-expenditure (YOE) dollars, subject to small adjustments at project close-out. The average cost per mile was $150 million including all capital costs. Construction of the physical elements represented 72 percent of all costs.



The Metro Gold Line Eastside Extension between Union Station and East Los Angeles

In YOE dollars, the predicted capital cost at PE-entry was $759.5 million (-17 percent compared to the actual YOE cost), at FD-entry $817.9 million (-9 percent), and at the FFGA $898.8 million (+1 percent). The under-estimate at PE-entry was caused primarily by underestimates for construction and special conditions associated, in particular, with the 2-mile tunnel segment, and professional services including design and construction management. The under-estimate at FD-entry was again caused primarily by underestimates for construction and special conditions; a substantially higher estimate for professional services brought that item into alignment with its actual cost outcome. The underestimates of costs for construction and special conditions continued at the FFGA but were offset by the unallocated contingency reserve of 10 percent in the FFGA – leaving a surplus of approximate $10 million.

Transit service

On weekdays, the entire Gold Line operates 6-minute headways during the peak periods, 12-minute headways during mid-day and 20-minute headways in the evening. Peak-period headways were tightened with the opening of the Eastside Extension from the 10-minute service provided on the initial Gold Line segment to 7.5 minutes on the entire line, and then tightened again to the current 6-minute-headway service. Running time on the 6.0-mile extension is 24 minutes including dwell times at stations – an average speed of 15.0 mph.

Metro made only limited changes to bus services in conjunction with the Eastside Extension project. Service on one bus route was dropped east of the Indiana Street station but later restored, through the rerouting of a second route, in response to a petition from riders. Metro adjusted a third route, a neighborhood circulator, to provide connections with the Eastside Extension at its terminal station at Atlantic.

For much of project development, Metro anticipated 5-minute headways in the peak-periods, 12 minutes during mid-day, and 20 minutes in the evenings in the 2020 horizon year – service levels that match closely the actual service just two years after project opening. The FFGA specified less service in the peak periods – 10-12 minute headways – a policy that was never implemented. At the early milestones, runtimes were assumed to be 16 minutes from Union Station to the terminus at Atlantic. More detailed analysis during FD added dwell times at stations and delays caused by at-grade intersections, producing the 22-minute runtime anticipated in the FFGA – reasonably close to the actual 24-minute actual runtime. Throughout project development, Metro anticipated limited changes to the bus system consistent with the actual outcome.

Operating and maintenance costs

In constant dollars that remove general inflation effects from the comparisons, the costs of Gold Line operations and maintenance increase from $38.9 million before the Eastside Extension to $58.6 million after the extension and subsequent tightening of peak-period headways. Of this $19.7 million increase, $17.8 million is attributable to operations and maintenance of the extension.

During project development, Metro projected the O&M cost of the extension (in 2020, but with anticipated service levels that closely match current service on the project) at $15-16 million – within 15 percent of the actual outcome.

Ridership

Two years after opening, ridership on the project was 13,000 trips per average weekday.

During project development, predicted ridership on the project for the 2020 horizon year was 18,000 trips at PE-entry, 15,200 trips at FD-entry, and 16,300 trips at the FFGA. No opening-year predictions were prepared. The pace of ridership growth on the project suggests that it is on track to meet, and perhaps exceed, the 2020 horizon-year predictions.