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Newark Light Rail (tie)

TOP PROJECTS COMPLETE

\$208 MILLION

In the early 1900s, trolleys traversed the streets of Newark, linking downtown with surrounding communities. But they disappeared last century as part of the national trend of gasoline-powered buses taking over municipal fleets.

But in July 2006, surface rail returned to a stretch of downtown Newark with the start of service on a new 1-mi leg called the Newark Light Rail that links the city's Pennsylvania Station and Broad Street Station. The two hubs are among the state's busiest commuter train stations serving New Jersey Transit lines, with Amtrak also using the Pennsylvania facility.

The \$207.7 million line also has five new stops in the city's downtown, providing rail access to the New Jersey Performing Arts Center, Riverfront Stadium, Newark Museum, and Broad Street shopping district. New Jersey Transit, which built the system, says it is initially expected to handle 4,000 weekday trips, and could expand to 7,000 by 2010.

The project team threaded the line through the congested city, having to widen Broad Street to insert a 2,000-ft section of track in the existing westbound lanes and to realign parts of busy Route 21 as well. Excavation continually turned up unexpected utilities and other obstacles.

A major task was construction of an 850-ft-long tunnel near Pennsylvania Station. The team had to demolish 190 ft in two abandoned turnout tunnels, then construct the new 14.5-ft-wide, 18.5-ft-deep, cut-and-cover tunnel while protecting adjacent structures such as the six-story Episcopal House, which was only 10 ft away. The team built a 90-ft reinforced-concrete wall to support the building's footings.



At one location, the tunnels run under PSE&G utility vaults and transformers. The team installed caissons and a steel frame around the equipment, and then hung the utilities from threaded rods during tunnel construction.

The tunnel and at-grade sections were handled under separate contracts, requiring detailed coordination to connect the two sections between the contractors, E.E. Cruz and Co. of Holmdel, N.J. and Conti Enterprises of South Plainfield, N.J.

The system's track, mostly at-grade, sits atop an 8-ft-wide, cast-in-place concrete slab that is 3 to 5 ft thick. System power comes from electrical duct banks installed in 10-ft spaces below the slab.

A floating track slab – which uses rubber-bearing pads to separate the 1-ft-thick concrete foundation from the concrete track slab – dampens vibrations in an 800-ft-long leg near the performing arts center.

Key Players

Owner: New Jersey Transit

Construction Manager Joint Venture: DMJM + Harris, STV Inc.

General Contractor-Tunnel: E.E. Cruz and Co.

General Contractor-Civil: Conti Enterprises

Architect: FXFowle Architects

Design Consultant Joint Venture: BRW Group, PB Americas

Consulting Engineer: Mueser Rutledge Consulting Engineers

Structural Engineer: KS Engineers

Tunnel Ventilation System: Daidone Electric

Utility Relocation: Anselmi & Decicco

Acoustical Engineer: Wilson Ihrig & Associates