Metro Crenshaw/LAX Transit Corridor Project

Projects: Metro Crenshaw/LAX Transit Corridor

Owner: Los Angeles Metropolitan Transportation Authority (LACMTA)

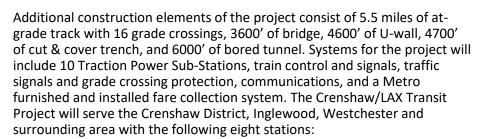**Client:**   Walsh/Shea Corridor Constructors JV

Soteria's Role: System safety and security planning, analysis, and security Reliability, availability, and maintainability

Completion: Three phases completed 2022 - 2024

Project Overview

The Metro Crenshaw/LAX Transit Corridor project is an 8.5-mile light commuter rail line that will run between the Expo Line on Exposition Blvd and the METRO Green Line. The southern end of the new line will follow along a portion of an abandoned BNSF freight line until it reaches the intersection of West 67th Street and Crenshaw Blvd. From the intersection of West 67thStreet and Crenshaw Blvd, the line will continue north along Crenshaw Blvd where it will ultimately tie in to the Expo line at West Exposition Blvd.

Lynnwood S Lake Terrace Station

Additional construction elements of the project consist of 5.5 miles of at-grade track with 16 grade crossings, 3600' of bridge, 4600' of U-wall, 4700' of cut & cover trench, and 6000' of bored tunnel. Systems for the project will include 10 Traction Power Sub-Stations, train control and signals, traffic signals and grade crossing protection, communications, and a Metro furnished and installed fare collection system. The Crenshaw/LAX Transit Project will serve the Crenshaw District, Inglewood, Westchester and surrounding area with the following eight stations:

East Link S Bellevue Station

- Expo/Crenshaw
- Martin Luther King Jr.
- Leimert Park
- Hyde Park
- Fairview Heights
- Downtown Inglewood
- Westchester/Veterans
- Aviation/Century

Schedule for Completion

Federal Way South 272nd St. Station

- Fall of 2022: Expo/Crenshaw Station to Westchester/Veterans Station
- Fall of 2023: Rail service extension from Westchester/Veterans Station to Green Line Aviation Station
- Late 2024: Opening of the AMC Station to the public

Soteria's Contribution to This Project

Soteria Company is leading the system safety, security and assurance planning, analysis, and certification through all phases of the safety and security certification process through design and construction and start-up. We are also responsible for the reliability and maintainability planning, analysis, and demonstration program. Soteria is a subcontractor to the Design-Build contractor, Walsh-Shea Corridor Constructors JV, and is leading the following **system safety and security planning, analysis, and security tasks** for the project:

- Develop and implement the **Safety and Security Certification Compliance Plan**, covering all systems and facilities and including all project phases from design through construction, testing, and start-up.
- Develop the **Design Criteria Conformance Checklists**. Coordinate and facilitate the verification, audit, and certification of the checklists, including presentation at certification meetings for final acceptance by Metro and the CPUC.
- Develop the **Construction Specification Conformance Checklists**. Coordinate and facilitate the verification, audit, and certification of completed checklists, including presentation at certification meetings for final acceptance by Metro and the CPUC. Checklists are an online Access database viewable by authorized project staff and stakeholders. Checklist verification utilizes the project's tablet-based field inspection application, which supports the creation of online document verification files.
- Develop and facilitate the **Verification Checklist for Testing Activities**, including audits and final certification.
- Develop and prepare the **Safety and Security Certification Verification Report** (SSCVR) for acceptance by Metro and the CPUC.
- Organize, facilitate, and support the **Safety and Security Certification Review Team** (SSCRT) meetings. Lead meetings and prepare meeting notices, minutes, and materials for regular meetings throughout the project duration.
- Organize, facilitate, and support the **Fire Life Safety and Security Committee** (FLSSC) meetings. Lead meetings and prepare meeting notices, minutes, and materials for regular meetings throughout the project duration.
- Prepare **Preliminary Hazard Analysis** (PHA) for all project systems and facilities. Update and verify compliance with final design. Coordinate and facilitate final verification of hazard mitigations prior to revenue operations. Facilitate and document audits and present for certification.
- Facilitate and prepare **Threat and Vulnerability Assessment** (TVA), including field assessments and workshops with Metro, local law enforcement and design team participants. Update and verify compliance with final design. Coordinate and facilitate final verification of hazard mitigations prior to revenue operations. Facilitate and document audits and present for certification.
- Prepare **Operating Hazard Analysis** (OHA) to assess and mitigate the effects of potential human errors on system safety. Develop draft and final reports and verify compliance with final design, training and O&M manual requirements. Use as a checklist to guide operational readiness and facilitate final verification of hazard mitigations prior to revenue operations. Facilitate and document audits and present for certification.

Soteria is leading the following Reliability, Availability and Maintainability tasks:

- Develop, prepare, and implement the **Reliability, Availability, Maintainability, and Demonstration (RAMD) Plan**. Include specific reliability and availability goals for all critical systems and equipment.
- Prepare **Reliability and Availability Analyses** for all communications, train control and traction power systems and equipment. Update analyses as required for system changes.
- Develop, prepare, and implement **Reliability and Maintainability Demonstration Plans**, including preparation of final reports.

- Develop and prepare an overarching **System Software Verification and Validation Plan** (SVVP) for the project. The SVVP includes developing and facilitating a consistent V&V process for all processor-based systems. The SVVP ensures that all software is adequately tested prior to final acceptance and that software configuration management controls are implemented to ensure that final delivery of software systems is properly documented and controlled.
- Develop and prepare a **Maintainability Plan for the Train Control System and Communications Systems**.
- Develop and prepare **Failure Mode Effects and Criticality Analysis** (FMECA) for Train Control, Communications, Traction Power, and Emergency Ventilation systems.
- Develop and prepare quantitative **Fault Tree Analysis** (FTA), as required, to supplement the FMECAs and resolve any outstanding reliability or safety issues.
- Oversee and implement the **RAMD Demonstration Test** for one year beyond the start of revenue operations. Hold failure resolution meetings and document results of demonstration via the **Failure Reporting, Analysis, and Corrective Action System** (FRACAS).
- Prepare a final **RAMD Demonstration Test Report**.