Metro Crenshaw/LAX Transit Corridor Project

SOTERIA PROJECT PROFILE

SOTERIA CO
building the safest route home

Project: Metro Crenshaw/LAX Transit Corridor Project

Owner: Los Angeles County Metropolitan Transportation Authority

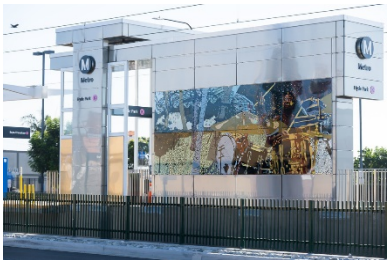
Client: Walsh/Shea Corridor Constructors JV

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 runs between the Expo Line on Exposition Blvd and the Metro Green Line. The southern end of the new line follows 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 67th Street and Crenshaw Blvd, the line continues north along Crenshaw Blvd where it ties in to the Expo line at West Exposition Blvd.



Hyde Park Station

Additional construction elements of the project consisted 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 included 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:

LAX Metro Station

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

Fairview Heights Station

Schedule for Completion

- 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 led 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 were also responsible for the reliability and maintainability planning, analysis, and demonstration program. Soteria was a subcontractor to the Design-Build contractor, Walsh-Shea Corridor Constructors JV, and led the following **system safety and security planning, analysis, and security tasks** for the project:

- Developed and implemented the **Safety and Security Certification Compliance Plan**, covering all systems and facilities and including all project phases from design through construction, testing, and startup.
- Developed the **Design Criteria Conformance Checklists**. Coordinated and facilitated the verification, audit, and certification of the checklists, including presentation at certification meetings for final acceptance by Metro and the CPUC.
- Developed the **Construction Specification Conformance Checklists**. Coordinated and facilitated the verification, audit, and certification of completed checklists, including presentation at certification meetings for final acceptance by Metro and the CPUC. Checklists were kept in an online Access database viewable by authorized project staff and stakeholders. Checklist verification utilized the project's tablet-based field inspection application, which supports the creation of online document verification files.
- Developed and facilitated the **Verification Checklist for Testing Activities**, including audits and final certification.
- Developed and prepared the **Safety and Security Certification Verification Report** (SSCVR) for acceptance by Metro and the CPUC.
- Organized, facilitated, and supported the **Safety and Security Certification Review Team** (SSCRT) meetings. Led meetings and prepared meeting notices, minutes, and materials for regular meetings throughout the project duration.
- Organized, facilitated, and supported the **Fire Life Safety and Security Committee** (FLSSC) meetings. Led meetings and prepared meeting notices, minutes, and materials for regular meetings throughout the project duration.
- Prepared **Preliminary Hazard Analysis** (PHA) for all project systems and facilities. Updated and verified compliance with final design. Coordinated and facilitated final verification of hazard mitigations prior to revenue operations. Facilitated and documented audits and presented for certification.
- Facilitated and prepared the **Threat and Vulnerability Assessment** (TVA), including field assessments and workshops with Metro, local law enforcement, and design team participants. Updated and verified compliance with final design. Coordinated and facilitated final verification of hazard mitigations prior to revenue operations. Facilitated and documented audits and presented for certification.
- Prepared **Operating Hazard Analysis** (OHA) to assess and mitigate the effects of potential human errors on system safety. Developed draft and final reports and verified compliance with final design, training, and O&M manual requirements. Used the OHA as a checklist to guide operational readiness and facilitate final verification of hazard mitigations prior to revenue operations. Facilitated and documented audits and presented for certification.

Soteria led the following Reliability, Availability and Maintainability tasks:

- Developed, prepared, and implemented the **Reliability, Availability, Maintainability, and Demonstration (RAMD) Plan**. Included specific reliability and availability goals for all critical systems and equipment.
- Prepared **Reliability and Availability Analyses** for all communications, train control and traction power systems and equipment. Updated analyses as required for system changes.
- Developed, prepared, and implemented **Reliability and Maintainability Demonstration Plans**, including preparation of final reports.

- Developed and prepared an overarching **System Software Verification and Validation Plan** (SVVP) for the project. Our contribution to the SVVP included 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.
- Developed and prepared a **Maintainability Plan for the Train Control System and Communications Systems**.
- Developed and prepared **Failure Mode Effects and Criticality Analysis** (FMECA) for Train Control, Communications, Traction Power, and Emergency Ventilation systems.
- Developed and prepared quantitative **Fault Tree Analysis** (FTA) to supplement the FMECAs and resolve any outstanding reliability or safety issues.
- Oversaw and implemented the **RAMD Demonstration Test** for one year beyond the start of revenue operations. Held failure resolution meetings and documented results of demonstration via the **Failure Reporting, Analysis, and Corrective Action System** (FRACAS).
- Prepared a final **RAMD Demonstration Test Report**.