

Command, Communication, & Control Systems

SYSTRA is an established leader in the application of industry standard processes, and hardware and software for command and control systems. From small-scale, computer-based CTC machines and SCADA development projects, to the largest ATS systems in the industry, SYSTRA is a leader in comprehensive requirements development and management, and system development, testing, and commissioning. SYSTRA has been working with New York City Transit for a decade in support of the agency's goals for centralized service management of the largest transit system in North America. When completed, the ATS system will provide real-time train monitoring and control tunnel ventilation of New York City Transit's more than 6,000 daily trains which move over 4 million customers. Through such experience, SYSTRA's professional team has a solid understanding of the operational needs of transit authorities and routinely incorporates design considerations into projects including effective construction staging plans to facilitate uninterrupted service.

Specific areas of project expertise include:

- Signals & Train Control
- Communications
- Security Systems
- Control Center Systems
- Fare Collection Systems

SYSTRA has direct, hands-on experience and knowledge of modern, state-of-the-art train control systems and equipment in use today and planned for the future. Our signals and train control teams work closely with other systems and disciplines to ensure successful systems integration and interface design. The firm's staff is rounded with experts in all aspects of train control and signal system engineering including: wayside; carborne, central; circuit design and checking (relay and microprocessor-based systems); system safety analysis; block design; cab signaling (conventional and profile systems); operations analysis; system safety, reliability, and maintainability engineering; quality assurance; estimating; scheduling; highway grade crossings; and systems integration.

SYSTRA's communications engineers have a solid background in the spectrum of communications and electronic systems technology. Many of our people have direct experience as rail/transit managers; thus have dealt with the same challenges experienced daily. Because of the complex functionality often required in current systems, we use structured systems engineering procedures from project inception through completion. For clients including the PANY&NJ, NYCT, NJ TRANSIT, SEPTA, among others, SYSTRA's designers have supported the relocation of communications cables and devices, extended radio coverage by using fiber network in transportation tunnels, and led efforts in technical areas including: RF propagation, FCC licensing, radio and data radio, customer information systems PA and VMS, telephone, Intelligent Transportation Systems (ITS), CCTV and video analytics, and fire and life-safety systems.

Virtually all projects now have a heightened awareness for safety and security, and mass transit agencies' communications designs contribute greatly to the safety and security of their respective stations, depots, and terminals. SYSTRA has been addressing risks to security through all system specifications by requiring the removal of hardware devices that could introduce vulnerabilities. These basic design criteria determine security characteristics and business rules incorporated as part of system implementation. SYSTRA's security system expertise includes IDS and ACS, leading efforts to use built-in Video Analytics technology and Laser Intrusion Detection System upgrades to provide advanced security detection to administrators for rapid emergency response.



Additionally, SYSTRA engineers are well versed in transportation control center systems, providing services throughout the entire project lifecycle such as design and specification development, installation, testing, troubleshooting, maintenance, and staff training after delivery of a new CTC system.

SYSTRA brings a broad range of Automatic Fare Collection (AFC) system experience to projects, having supported the design of fare collection system equipment for major rail lines internationally. We offer support with First Article Inspection and Factory Acceptance Tests, and consider factors such as local infrastructure, cash handling equipment, and swing gates.

