

Light Rail System Case Study



Introduction

Bombardier Inc. has been contracted to update the SkyTrain rapid transit system in Vancouver, British Columbia, Canada. The update included extending the existing line, adding new trains and updating the existing Train and Radio Information Management System (TRIMS). Willowglen Systems Inc. has supplied Bombardier with our advanced SCADACOM® master station software and Programmable Audio Switch (PAS) in order to provide advanced monitoring and control features and to integrate the many varied external devices and subsystems.



Using Bombardier Transportation's Advanced Rapid Transit (ART) technology, SkyTrain is the flagship of driver-less, urban transit systems. With the opening of the 20.3 kilometre (12.6 mile) Millennium Line to passenger service in 2002, the 49 kilometre (30 mile) SkyTrain is the backbone of an impressive integrated land-sea-rail system and the longest driver-less system in the world.

Problem

Traditionally, a number of different subsystem suppliers were used for a Light Rail System (LRS) and many provide their own separate user interface. The Automatic Train Control (ATC) vendor typically offers a proprietary operator interface to the ATC and a limited number of interfaces to other LRS subsystems. The traditional approach quite often leads to independent, inconsistent, inflexible and costly solutions for the end customer. What is needed is a more integrated, flexible and less expensive solution.

Solution

2000

In a competitive bid, Willowglen Systems Inc. was selected to provide the new Train and Radio Information Management System (TRIMS) to Bombardier Inc. Willowglen's SCADACOM® product was selected because it integrates a number of the LRS subsystems into a single monitoring, control, reporting, data archiving and data analysis solution. The subsystems include:

- Automatic Train Control (ATC)
- Radio Communication Controllers (RCC)
- Station Platform Sign Controllers
- SkyTrain Management Information System (MIS)
- System Management Center (SMC)
- Passenger Information (PI) Displays
- Public Address (PA) System
- Private Automatic Branch Exchange (PABX)
- Operations and Management (O&M) radios

SCADACOM® displays the ATC system and is synchronized to a central Global Positioning System (GPS) Time Server clock.

In addition to the SCADACOM® servers and workstations; O&M speakers, operator communication sets, touch screen LCD displays and Programmable Audio Switches have also been included in this system. Willowglen has developed the custom Programmable Audio Switch hardware to switch the PA/PABX trunk lines, radio/speaker and public address circuits as required.

The user interface is used to:

- Monitor Train Locations
- Monitor Train Health
- Faults and Operating Statistics
- Communicate with Passenger and Maintenance Personnel
- Alert for any Vehicle Silent and Smoke Alarms
- Monitor and Communicate using O&M radio
- Control Station Platform Displays
- Initiate PA calls to Vehicles and Stations
- Monitor and Control Vehicle Systems

The operators can initiate, receive and control calls through the PABX. All telephone, radio switching and PA activities are logged by the SCADA system.

The resulting system consists of very user-friendly operator stations. New database objects and graphic symbols have been developed for this project. Willowglen has provided Bombardier with a system that they can easily configure to interface to the many varied LRS devices so that the operator is quickly provided with the required information in a very integrated and consistent fashion.

2009

A major system upgrade with the SCADACOM® 3.0 software being replaced with the SCADACOM® 3.1 software.