

## Case Study: Keeping Buses Moving

**City of Mississauga pilots an integrated system designed to keep buses running on schedule.**

### **The Client**

Mississauga Transit moves more than 70,000 commuters daily and wanted to implement solutions to not only help move those commuters more quickly and efficiently than ever before, but to also make public transport more reliable to encourage more people to choose public transport over cars for their daily commute. Part of the solution is the implementation of the SmartBus program.

### **Smart Bus Program**

The SmartBus program uses sophisticated integration technology from Visual Defence to integrate an Automatic Vehicle Locating (AVL) system, passenger counting and traffic control systems as well the city's scheduling software. The technology will enable these vehicles to report their precise location and passenger loads to transit signals along their route.

The system works in the following way. Two minutes before the bus begins its route, the bus receives the route schedule via a cellular network. The AVL system monitors where the bus is in relation to the schedule and sends the information to the central monitoring station where operators can view a "racetrack"



display of where the bus is in relation to where it should be.

Information from the passenger counting system regarding the number of people on the bus, as well as information regarding when and where the wheelchair ramp is activated is also sent throughout the day via the cellular network to the central monitoring station and stored in a database for analysis. Additionally, as a back-up, all information stored on the bus at the end of the day is downloaded by the central monitoring station via WiFi.

**"Our expectation is that it [the transit system] will be more responsive to rider patterns"**

*Fermin Pico,  
Mississauga Transit*

"Over the next few months more work is planned on assessing and understanding the wealth of information produced by the system and how to improve service delivery," says Fermin Pico, Mississauga Transit.

Additionally, the buses have an infra-red device that sends signals to the city's traffic control system.

An algorithm is built into these devices that set a threshold based on the number of people on the bus and/or how far the bus is running behind schedule. If this threshold is exceeded, the device sends a signal to the traffic control system to keep the light green longer or speed up a red to give the bus priority through the intersection.

### **Planning for the Future**

In the future, City of Mississauga plans to integrate the AVL system with the customer website. Users will be able to view a "racetrack" image of where the bus is on the route and receive real-time "next bus" information.

"We are just scratching the surface of the potential of the technology. Mississauga Transit riders, however, are starting to benefit from the initial efforts. Service planning has been adjusted for the incoming winter season and

our expectation is that it will be more responsive to rider patterns," says Pico

The SmartBus program is just one component of Mississauga's overall strategy to address gridlock and traffic congestion. Pico adds, "The goal of the program is to test and monitor changes to the traffic lights practices in order to strike a better balance between the movement of people and cars."

with the snow ploughs as well. Sensors on the snow ploughs detect when the plough is in use, how much salt or sand has been deployed and the temperature. These sensors connect to the same type of on-board device used by the buses that transmits the information to a central monitoring station. The City of Mississauga uses the information to better manage the fleet to realize operational efficiencies.

### Public Works

The City of Mississauga has adapted their bus solution to work

