



# Priority Bus Service Keeps Glasgow Moving With wi4 Mesh Solutions



## Overview: Glasgow, Scotland

Nestled on Scotland's west central lowlands, Glasgow is the country's largest city and third most populous in the United Kingdom. Nearly 600,000 residents call the city home along with many of Scotland's leading businesses. Glasgow is one of Europe's top 20 financial centers and is easily accessible by road, rail and air. Getting around the city, however, can prove to be a challenge particularly during rush hours when traffic times increase dramatically. The Glasgow City Council and First Bus — the city's transportation company — partnered to expedite traffic, improve journey times and enhance passenger security.

## The challenge: enable sustainable urban mobility, reduce traffic congestion and encourage usage of public transportation

Cities around the world have long struggled with traffic congestion and the associated problems of increased air and noise pollution, traffic accidents, lost productivity and sheer frustration. European cities often have added difficulty in coping with these problems as a great many streets and arteries can't easily support the enormous number of cars, vans, trucks and pedestrians on the already crowded streets. According to a recent study, Glasgow ranked as the seventh slowest city in Europe with average speeds of 30 kph.\* To increase traffic flow, attract more passengers and reverse long-term economic and environmental damage, the city needed an effective communications network that expedited the progress of buses through the city.

## The solution: a mobile broadband network that effectively accelerates the pace of the public transportation system

With an eye toward the future, the Glasgow City Council and First Bus deployed a priority bus system — Streamline — to relieve traffic congestion and improve bus transportation throughout the city. The system tracks the movement of 500 buses over eight key bus routes. If a bus slips behind schedule the system registers the information with the Traffic Control Center which then gives the bus priority at 241 remotely controlled traffic lights to get it back on time. The system also provides information to digital displays at stops, advising passengers of arrival time for the next bus as well as information on delays, diversions, congestion and road traffic accidents\*.

At the core of the Streamline system is the Motorola MOTOMESH™ Solo communications network with Mobility Enabled Access (MEA®) — a dedicated high-speed mobile broadband solution designed to improve situational awareness and incident response. Initially designed for military use in the battlefield, the MOTOMESH networking technology provides instant, reliable ad-hoc communication networks where fixed infrastructure is not available. MEA works where WiFi won't due to its extreme interference tolerance.

\* British Cities are Slowest in Europe. [www.keepmoving.co.uk](http://www.keepmoving.co.uk). October 15, 2007

## CUSTOMER PROFILE

### Company

Glasgow City Council  
and First Bus  
Glasgow, Scotland

### Technology partner

NOW Wireless  
Surrey, England

### Service provider

Private network

### Industry

Transportation

### MOTOWi4™ solution

- wi4 Mesh
- MOTOMESH network

### Solution features

- High-speed broadband connectivity
- Mobility
- Easy installation
- Cost-effective
- Fast, easy non-invasive installation

### Benefits

- Reduces traffic congestion and pollution
- Centralized monitoring and control
- Increased passenger satisfaction
- Keeps Glasgow moving



“Carrying about 40 times more people than the car, the bus reduces congestion and tackles pollution. The premise of Streamline is that, if the buses are reliable, people are more likely to use them. Streamline aims to keep buses to timetable intervals providing a predictable service around which people can structure journeys.”

— *Hamilton Purdie, Assistant Strategic Traffic Control Manager,  
Glasgow City Council*

## A PROGRESSIVE APPROACH

The Glasgow City Council established the Traffic Control Center in 1967. As one of the first local authorities to support a dedicated center, the road team is continually recognized for its progressive approach to managing traffic flow and its commitment to applying the latest technology to enhance overall operations. The Streamline system is yet another example of Glasgow's modern day approach to solving complex problems.

The MOTOMESH Solo equipment, deployed by technology provider NOW Wireless, has both infrastructure and client meshing capabilities. It self-registers and automatically connects to nodes to easily establish a self-provisioning network. In total, the Streamline system employs 241 wireless nodes and 83 Intelligent Access Points covering 140 kilometers. The nodes are installed in street cabinets maintained by Glasgow City Council's Land and Environmental Services department and communicate with the signals via antenna mounted on traffic light poles. At various points across the system, MOTOMESH access points establish links into the council's existing fiber network, in places such as libraries and council offices, to link the mesh coverage with the Traffic Control Center.

To smooth the progress of service, the Traffic Control Center tracks the location of buses throughout the network using onboard Global Positioning System (GPS) technology, roadside sensors, two-way radio systems, Bus Information and signaling (BIAS) application and SCOOT traffic management software. Based on immediate assessments of traffic volumes, the center then makes adjustments to signal phasing via the MOTOMESH network to clear free-moving bus corridors and keep services on schedule.

The network is very reliable and incorporates a range of technologies to slice through background noise generated by other wireless systems. Performance is twinned with cost benefits. The network is easy to install reducing capital expenditure, and is fail-safe so it's low cost to maintain.

Pivotal considerations behind the selection of the network technology were reliability and security — the roads team required broadband speeds and utmost reliability commensurate with 24/7 operation. Typically, these demands might suggest a wired network that would require a significant expense. It was impractical and cost-prohibitive for the city to build its own infrastructure, while accessing the systems of telecoms companies requires ongoing fees. In the end, a private wireless network proved quite effective at serving the needs of Streamline.

### **The benefits: improved journey times, reduced traffic congestion and enhanced passenger experience**

In Glasgow, over 130 million passengers are served annually by the bus service. Improving journey time was a high priority as it encouraged more riders to leave their cars at home and take the more expedient and convenient bus transportation. Government predictions previously suggested that congestion levels could increase by 38 percent by 2016. The Streamline system is the first step in altering the course of the future. Already passengers are reporting greater satisfaction and usage has increased.

In common with all public projects, it is essential that the city keep an eye on costs without compromising performance. MOTOMESH resolves this challenge by providing robust and affordable capability to build the network coverage needed to collect real-time traffic data and alter traffic light phasing accordingly. By applying real-time traffic control, the variability between journey times for buses traveling through the corridors is reduced considerably.



**MOTOROLA**

**Motorola, Inc.**

1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A.

[www.motorola.com/motowi4](http://www.motorola.com/motowi4)

MOTOROLA and the stylized M Logo are registered in the U.S. Patent and Trademark Office. All other products or service names are the property of their registered owners.

© Motorola, Inc. 2007