



IN ACTION



Location: Wakefield, United Kingdom

Client: Wakefield District Council

Application: Bus gate system

Product: GEM

Project: Bus gate system in Wakefield City Center

Drakewell

Background: Increasing traffic congestion in towns and cities offers great potential for buses to improve the mobility of travellers without increasing traffic. A package of measures on defined bus routes, including bus gates, bus priority and special bus lanes can serve to ensure free movement, particularly at peak times.

Bus gates are short lengths of 'bus only street' which allow buses to travel on direct routes that are prohibited to all other traffic. They are used to keep unwanted traffic out of an area whilst allowing the operation of a bus service on a direct route that is attractive to passengers, such as a high street. Local authorities have adopted a variety of approaches to make bus gates more effective. These include the application of a color or surface treatment to the gate or carriageway narrowing and protection by bus-activated traffic signals or rising bollards. This results in maximum accessibility for public transport.

History: GEM is a loop based intelligent bus priority system based on Idris software. GEM was developed because of an opening in the market previously occupied by the now-obsolete PRISM unit manufactured by Peek Traffic Ltd. Based around technology that was developed in 2005 by Diamond Consulting Services, it uses standard in-ground loops and a series of patented and highly complex algorithms. This enables the system to measure the speed, direction of travel, length and classification of any vehicle passing over the loop array. This type of technology is widely used to classify vehicles as they pass through tolling plazas, along with being seen as a data-profiling tool for the real-time management of traffic in a variety of situations, including bus priority.

Project Detail: Wakefield Council have implemented GEM into their bus gate system located in the city center, replacing the previous dual system which activated traffic lights and the bus gate system. Westmoreland Street and The Springs is closed to through traffic from the Bull Ring in the city center. This allows access only to buses from the Kirkgate area.

How it works: The function of the GEM unit is to detect the relevant vehicles and place a demand on the junction controller, in this case the traffic lights into and out of the pedestrian area. It is the responsibility of the junction controller to act upon that demand and to rectify and re-establish traffic movement and recover the timing after vehicle priority has taken place.

Detection occurs when a vehicle passes over a pair of loops in the bus lane, its inductance profile is analysed in real time and compared against a library of unique vehicle definitions held in the non-





volatile memory of the unit. At the heart of the technology are the Idris patented algorithms and a high level scripting language. This language has been developed to describe the inductive profiles of vehicles as they travel over the loop array. The scripting language, stored in a rule file, along with the associated software components to read the file, allows suitably qualified engineers to adjust or change the profiles being determined. The product eliminates the requirement for on-board equipment and enables a degree of 'client specific' requirements.

The system may also be taught to recognise additional profiles in order to keep pace with ever changing public transport designs.

Unique system features;

- Dynamic signal processing
- High speed communications
- Pinpoints vehicles position
- Flexible class tree - Customised to clients needs
- Identifies lane straddling
- Not reliant on templates or matching
- Distinguishes bus type using inductance profile
- Bus chassis recognition features
- Differentiates between buses and HGVs without the need for a height sensor

Results: The system provides a comprehensive improvement to all aspects of the bus travel experience, especially aiding buses to adhere to timetables by improving journey times. GEM helps to provide a fast, reliable and easy to use mode of travel which has encouraged a greater use of public transport.

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