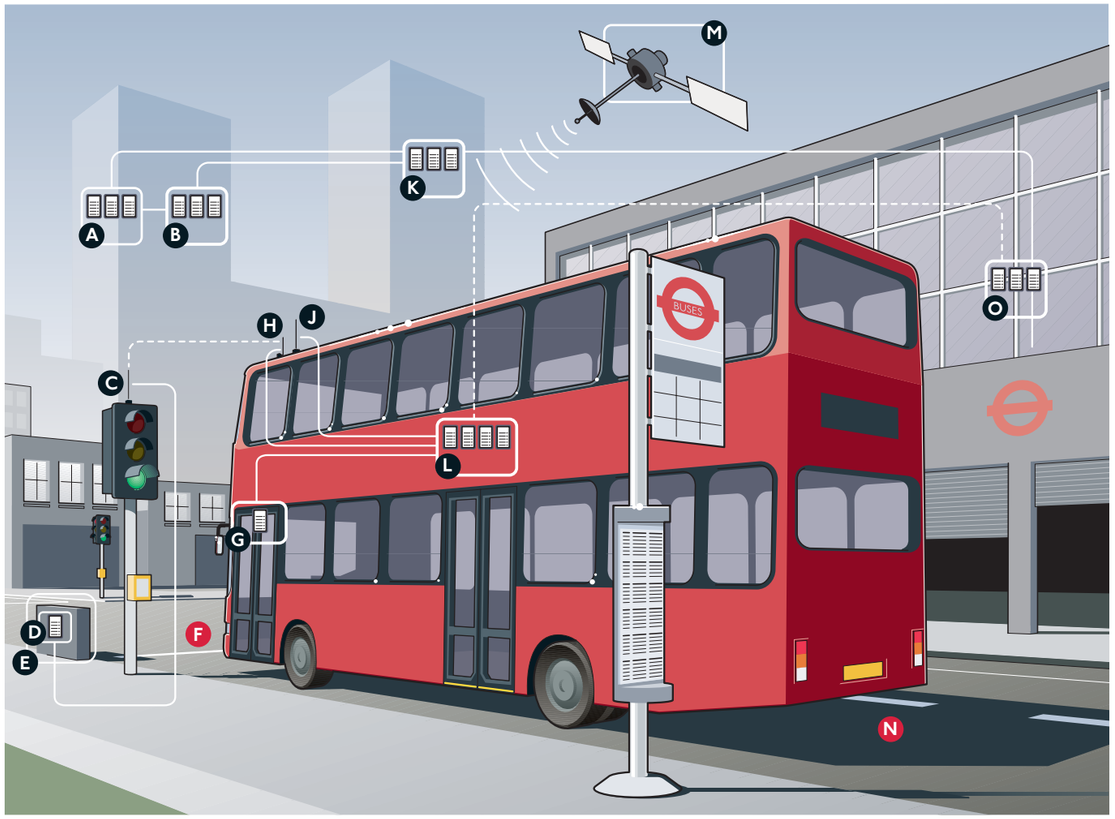
Selective Vehicle Detection



Key

- A Bus priority fault detection and performance monitoring reports
- B System databases
- C H Bus priority radio link
- D Bus processor (contained within traffic signal controller)
- E Traffic signal controller
- F N Bus detection points
- G Bus door sensor
- J GPS receiver
- K Central system server (located remotely)
- L iBIS plus unit
- M GPS satellites
- O Bus garage (when bus is in garage, it is linked to the central system server to send and receive bus priority data)

Further Information

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Transport for London

Bus priority at traffic signals keeps London's buses moving

Selective Vehicle Detection (SVD)

January 2006

MAYOR OF LONDON

This leaflet describes the use of Selective Vehicle Detection (SVD), the types of technology used, and summarises progress to date in the development and implementation of SVD in London.

SVD is a method of bus priority that allows buses to be progressed through traffic signals by prioritising their passage to improve speed and reliability for passengers.

1450 sites throughout the network have benefited from the introduction of SVD installations. In conjunction with other bus initiatives, bus priority measures have contributed to a 38% increase in bus patronage since 1999.

How SVD makes a difference

The current SVD system uses roadside beacon detection to provide bus priority. When a bus passes a beacon, the transceiver installed on the bus sends a signal to the beacon which then transmits a signal to the traffic signal controller. The traffic signal controller then manages the sequence of the lights to assist the transit of the bus through the junction. This can be by extending a green phase, skipping a stage or shortening the green phase for other traffic in order to give the bus a green signal earlier than would otherwise have been the case.

SVD, in conjunction with other bus priority measures, such as bus lanes, gives:

- Reduced travel times
- Increased reliability
- Increased service frequencies with the same number of vehicles
- Operational savings

Savings and Benefits

The table below gives a summary of results obtained to date through trials of the various systems. Over a whole bus route the benefits can be substantial. For example, route 15 passes through 65 signal junctions giving potential route length savings of over 4 minutes. Additionally, SVD installations offer extremely good value for money and typically pay for themselves in less than 18 months.

Since the inception of SVD, overall bus delays have reduced by approximately one third at the SVD signal priority installations within London.

The Current Position

In 2003 Transport for London (TfL) decided to explore the use of new Global Positioning Satellite (GPS) bus location systems in the application of SVD. The project, known as iBUS, is being undertaken in partnership with Siemens VDO Ltd.

How iBUS SVD works

The iBUS system utilises GPS technology and other on-bus systems such as odometer output and door sensors to communicate with the bus' on-board computer. The computer, known as the iBIS plus unit, is programmed with bus priority and other relevant information such as bus location details.

When a virtual detection point is reached as programmed into the iBIS plus software, a signal is sent to the transceiver in the signal controller requesting bus priority, and to a central location for performance monitoring.

The new bus location system provides a far greater degree of information about the bus and its journey than previous systems, and will be used for other purposes such as the provision of real time passenger information displayed in bus shelters.

Bus Priority Systems	Test Sites	Average Journey Time Savings/Bus/Junction (secs)	Average Delay Savings	System Payback Period
SVD at isolated junctions	Widespread rollout	9	32%	15 months
SVD at MOVA junctions	Hanworth	4-6	x	x
SPRINT	Uxbridge Road	2	x	x
Bus SCOOT	Edgware Road	3	33%	15 months
	Camden Road	5	22%	15 months
	Uxbridge Road	4	19%	5 months
	Twickenham Town Centre	2-5	6%	18 months
	Bromley	3-5	19%	10 months
	Kennington	3-5	16%	10 months
Metering in Bus SCOOT with bus lanes (a.m. peak)	Twickenham Town Centre	5	13%	7 months

X = not available

MOVA Allows more flexible control of isolated junctions
SPRINT Allows active bus priority within a fixed-time Urban Traffic Control network
Bus SCOOT Allows active bus priority within SCOOT (a traffic-responsive Urban Traffic Control system)

Additional benefits for SVD utilising iBUS technology include:

- Reduced cost of roll-out per SVD junction
- More SVD junctions can be delivered for the same money
- Increased speed of roll-out
- Decreased maintenance costs
- Less requirement for roadside furniture
- Increased performance information for SVD system

Future Developments

The intrinsic flexibility of the iBUS SVD system also provides greater development opportunities than previous methods of control.

Phase 1 iBUS SVD will largely replace the existing beacon (and older loop based systems) whilst maintaining the same benefits. It will also provide a two-way communications link between the bus and traffic signals providing high levels of fault detection and performance monitoring.

Phase 2 iBUS SVD will achieve greater benefits through the use of additional bus detection points at junctions. Specific examples include; adding exit detectors at junctions to cancel the green extensions as soon as the bus has passed the signals, and providing differential priority to buses depending on their headway, route priority or schedule. In addition phase 2 aims to extend the technology to all eligible Pelican, Toucan and Puffin pedestrian crossings.

In a future phase, the two-way communications link will be used to allow new strategies to be implemented. An example of this would be sophisticated two-way communication between the bus and the signals to exchange bus speed and location information. This will allow the signals phase to be optimised ensuring the bus reaches the signals at green.