



# Standards and Guidance Documents

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## TRAFFIC ADVISORY LEAFLET ITS 4/03

### Parking Guidance and Information

This leaflet is one of a series of documents from the ITS Assist Project. ITS Assist is a Department for Transport (DfT) initiative that aims to encourage and promote across the UK the use of Intelligent Transport Systems (ITS) as tools to implement local transport policy objectives.

Parking Guidance and Information (PGI) Systems provide drivers with dynamic information on parking within controlled areas. The systems combine traffic monitoring, communication, processing and dissemination technologies to provide the service.

This document provides local authorities with an overview of parking management system components and the benefits that can be achieved through their deployment.





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## BACKGROUND

Parking Guidance and Information can assist in delivering many highway authority policy objectives and provide a safe, efficient and environmentally friendly transportation network. PGI systems can deal effectively with the following network problems:

- Excess queues at car parks;
- Congestion on the surrounding road network;
- Poor air quality; and
- High percentage of visitors in tourist areas.

A PGI system provides greatest benefit when demand for off-street parking is approximately equal to supply. Excess demand for off-street spaces results in the system having little impact on the problems

resulting from parking demand. On the other hand, if demand is sufficiently less than supply, spaces are easy to find and the system provides little benefit.

A system helps the public by directing them to car parks where there are vacant spaces, reducing time wasted searching or queuing at car park entrances. This in turn reduces congestion on the road network near the controlled car parks, benefiting other traffic. Non-quantifiable benefits include improved public image of car park management and reduction in driver frustration.

If the public can access parking information before they start their journeys – and therefore decide not to use their cars if car parks are full - parking management systems can

then help deliver:

- Reduced demand for parking;
- Reduced environmental impact of vehicular emissions; and
- The transfer of car travel to more sustainable modes.

PGI systems have traditionally been employed in the urban environment to assist with off-street parking. In recent years, the technology has also been used to promote Park and Ride services, with the parking system acting as a catalyst to encourage greater use of more sustainable forms of transport.

## PARTNERSHIP

The deployment of PGI systems may require operational and institutional frameworks to be developed with other organisations. These organisations are generally the major stakeholders such as the car park owners, operators and network managers.

As they can affect the equipment requirements, the operational procedures for the system should be developed in parallel with the systems specification. Items to consider include operational costs, maintenance and communication costs and the development of roles and responsibilities for the partners. Agreements between the partnerships could be set down in a Memorandum of Understanding.

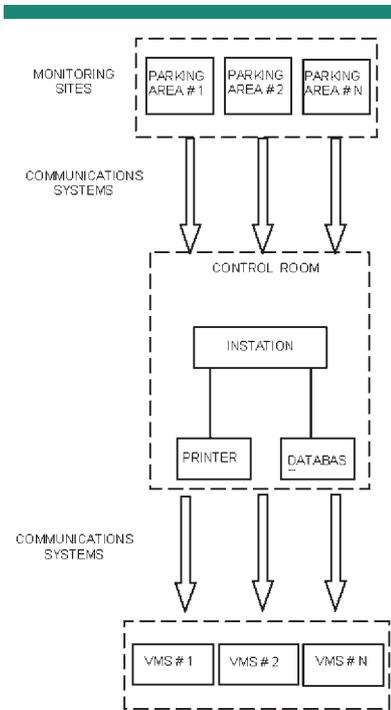
Maintenance agreements normally form part of the contract documents and may cover software, signs and monitoring equipment. The ability to expand and develop the system should also be considered as part of the system design.



## SYSTEM DESIGN

A Parking Guidance and Information system has four essential elements:

- Monitoring;
- Communication;



KEY COMPONENTS OF A PGI

PREPARED FOR ITS BY FABERMAUNSELL

- Instation; and,
- Variable message Sign (VMS).

These are illustrated in the above figure.

Monitoring equipment must be installed at parking areas to establish the flow into and out of the car parks in order to calculate the number of available spaces.

Car park count data are transmitted back to a central location and processed before being presented to the public via VMS or other media such as radio or a web site.

VMS are located at suitable decision points on the network, so that a driver's journey time to a vacant space is minimised. VMS generally show the number of vacant spaces or information such as "Spaces", "Full" and "Closed".

Car parks are often grouped into zones to reduce the information that has to be presented on any single sign.

## AVAILABLE TECHNOLOGIES

Parking systems have benefited from a reduction in costs of Variable Message Sign technologies and the development of reliable platforms to process the information.

Variable Message Signs - can be classed into two main categories:

- **Electronic Message Signs (EMS):** These signs are able to display a full range of messages and symbols (not only related to car park information); the most common type of sign is the Matrix Sign. Signs can be made with different number of characters and character sizes to suit the location and the messages to be displayed; and
- **Limited Function Signs:** These signs are only able to display a very limited amount of information; the most common

type of signs are Rotating Prisms and Fixed Plate Signs with LED (Light Emitting Diode) panels.

## MONITORING

One of the fundamental requirements for a successful PGI system is the accurate collection and assessment car park ingress and egress flows. Data is collected from detectors placed at all entrances and exits. Different forms of detectors can be used, including: Inductive Loops, Microwave Radar and Infrared.

All detectors are subject to error, and it is therefore necessary to reset the counts recorded in the system from time to time. This is usually carried out when the car park is closed or early in the morning. A manual count of the cars in the car park is taken, and the number recorded in the system is changed to match the actual number. The accuracy of detection depends on local factors and can be improved by careful siting and choice of detector.



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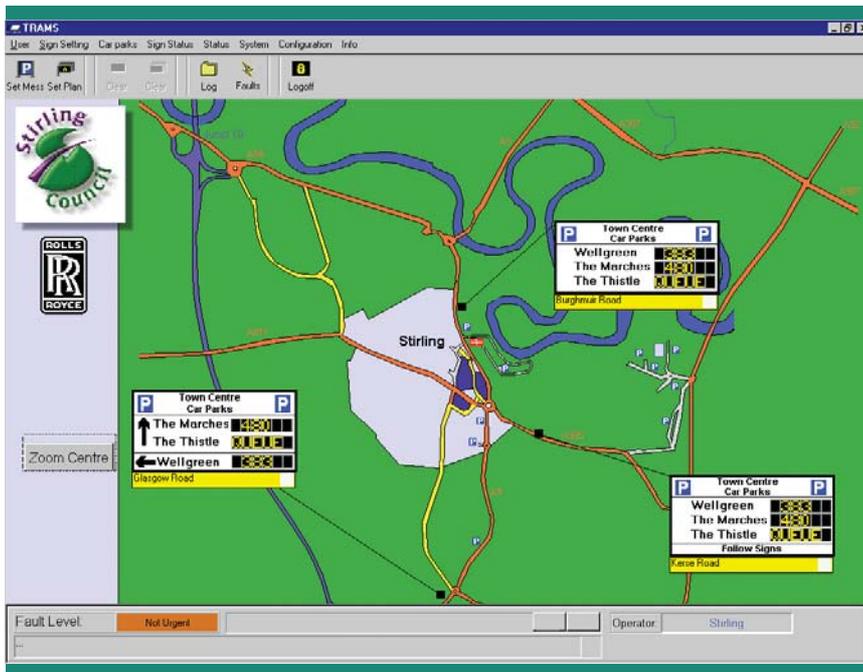


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TYPICAL DISPLAY OF A PGI SYSTEM

### REPORTED BENEFITS

Case studies illustrate that there are significant benefits that can be derived from PGI systems both in terms of quantifiable and qualitative benefits. Some of the key findings include:

- A survey in Southampton found that drivers reduced the time spent searching for a parking space on average by 50% from 2.2mins to 1.1mins(3);
- A survey of over 600 people in Valencia, Spain found that 61% of people were influenced by the information on VMS signs and 30% had changed their parking destination as a result (3) ;
- Improved parking information can raise the public's image of the area, which can lead to improved revenue generation within that area;
- Improved parking information could lead to safer driving

behaviour, as drivers are guided straight to an available space; and

- Improved utilisation of off-street long stay car parks may improve the accessibility to short stay on-street parking areas.

### EVALUATION

It is recommended that all Local Authorities and Passenger Transport Executives investing in such systems monitor and evaluate the operational performance of systems in accordance with the Guidance on Local Transport Plans produced by the DfT.

Where Car Park Information systems are developed within a Urban Traffic Management and Control environment(4) the UTMC common database can be used to store data, and a performance evaluation module can be developed to assist in monitoring, optimising and quantifying system performance. The 'UTMC 05a Performance Criteria for UTMC Systems Handbook'(5) and 'Technical Note' provides further advice on this; see the References of this note.



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EXAMPLE OF EMS SIGN

## CONTACTS

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To find out more about the wide range of ITS-related initiatives and projects supported by DfT, and the development of ITS policies to encourage and promote greater deployment of ITS, please contact Transport Technology and Telematics division of the Department for Transport at: [its@dft.gsi.gov.uk](mailto:its@dft.gsi.gov.uk)

## REFERENCES

- (1) Axhausen, et al, Effectiveness of Parking Guidance Information System in Frankfurt, Traffic Engineering Control, May 1994;
- (2) Clarke and Welsh, Car Park Monitoring and Information Systems: Their Integration in Birmingham, Traffic Engineering and Control, October 1995;
- (3) M Mcdonald and K Chatterjee, VMS in Urban Areas – Results of Cross Project Collaborative Study, TAP – Transport Sector CONVERGE D.3.3.1
- (4) UTMC – [www.utmc.dft.gov.uk](http://www.utmc.dft.gov.uk)
- (5) UTMC 05a Performance Criteria for UTMC Systems Handbook' and 'Technical Note': (DTLR) ([www.utmc.dft.gov.uk](http://www.utmc.dft.gov.uk))

### DfT WEBSITE [www.dft.gov.uk](http://www.dft.gov.uk)

Details of Traffic Advisory Leaflets available on the DfT website can be accessed as follows:

From the DfT homepage, click on the Local Transport icon and then on Traffic Advisory Leaflets. Lastly, click on one of the themes to view material.

The Department for Transport sponsors a wide range of research into traffic management issues. The results published in Traffic Advisory Leaflets are applicable to England, Wales and Scotland. Attention is drawn to variations in statutory provisions or administrative practices between the countries.

The Traffic Advisory Unit (TAU) is a multi-disciplinary group working within the Department for Transport. The TAU seeks to promote the most effective traffic management and parking techniques for the benefit, safety and convenience of all road users.

### Department for Transport

Requests for unpriced TAU publications to:  
Charging and Local Transport Division,  
Zone 3/23, Great Minster House  
76 Marsham Street, London, SW1P 4DR.  
Telephone 020 7944 2478  
e-mail: [tal@dft.gsi.gov.uk](mailto:tal@dft.gsi.gov.uk)



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Parking



Signs and Signals



Intelligent Transport Systems

### Scottish Executive

Within Scotland enquiries should be made to:  
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e-mail: [neil.weston@scotland.gsi.gov.uk](mailto:neil.weston@scotland.gsi.gov.uk)

### Llywodrath Cynulliad Cymru Welsh Assembly Government

Within Wales, enquiries should be made to:  
Welsh Assembly Government,  
Transport Directorate, 2nd Floor, Cathays Park,  
Cardiff, CF10 3NQ  
Telephone 029 2082 5111  
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