Hampshire County Council

Economy, Transport and Environment Department

Technical Guidance Note
TG4-3 CCTV, VMS and Journey Time Monitoring

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1. Policy / Approach

1.1. The overall approach to the design of new intelligent traffic systems needs to reflect a number of current and emerging policy developments as detailed in TG4-1 – Traffic Signal Junctions and TG4-2 – Signal Controlled Crossings.

1.2. Local Transport Plan 4 (LTP4) is currently being developed, which will focus on meeting the Net Zero carbon target. It will include policies that reduce the need to travel and enable a significant increase in walking, cycling and public transport. Further policy developments include developing a Healthy Streets Toolkit and a Movement and Place approach to defining the appropriate design approach for different parts of the street and highway network.

1.3. New ITS installations (CCTV cameras, Traffic Information and Car Park Occupancy Variable Message Signs (VMS), Journey Time Monitoring Systems) within the highway network will be used to support the emerging LTP4 policies together with facilitating safe operation of signal junctions/crossings. However, use of such additional infrastructure shall also be limited to essential locations only to minimise on-going maintenance costs and street clutter; the majority of schemes will not require CCTV or VMS.

1.4. The concept for an ITS installation may evolve in one of two ways. Either internally from the Intelligent Transport Systems Group (ITS) or externally from a Consultant representing a private Developer. The outline design for any of these elements will be carried out by the ITS Group. Contact the ITS Group at intelligent.transport.systems@hants.gov.uk for further advice.

1.5. For HCC schemes Commuted Sums will be secured by the scheme client. For external Developer schemes Commuted Sums will be secured through the S278/S38 Legal Agreement.

1.6. The ITS Group will be involved at all stages in the design, development and installation of CCTV, Traffic Information and Car Park Occupancy VMS and Journey Time Monitoring systems.

1.7. Each location for an ITS installation differs and as such there is no definitive design that can be applied to all sites. The aim of this document is not to provide guidance on how each element of an ITS installation should be designed. It remains the designer's decision on how to design each installation. The purpose of this document is to provide outline guidance of the procedure and expectations for ITS installations. Ultimately specific site circumstances will determine the approach and suitability of individual designs. Refer also to Technical Guidance Note TG 17 - Departures from Standard which details the terminology used throughout the TGs and when Departures from Standard are required.

2. Definitions and Abbreviations

ANPR	Automatic Number Plate Recognition
CCTV	Closed Circuit Television
DMRB	Design Manual for Roads and Bridges
HCC	Hampshire County Council
ITS	Intelligent Transport Systems
ITS Group	Intelligent Transport Systems Group - Team within Hampshire County Council responsible for traffic signal technical design checks and ordering equipment for ITS installations. Also responsible for the operation and maintenance of ITS installations within the County.
RSA	Road Safety Audit
S278	Section 278 of the Highways Act (1980)
S38	Section 38 of the Highways Act (1980)
SSD	Stopping Sight Distance – the forward visibility requirement to the nearside primary signal head
SSE	Scottish and Southern Electricity
TG	Technical Guidance
VMS	Variable Message Signs (Traffic Information and Car Park Occupancy)

3. General

3.1. Design standards applicable in the design and installation of ITS systems include:

Traffic Signs Manual Chapter 6 (roads subject to speed limit of 40mph or under).

Chapter 6 shall also be applicable to any arm which has a speed limit above 40mph and where no other applicable guidance is provided in the Design Manual for Roads and Bridges.

Design Manual for Roads and Bridges

CD 109	Highway link design
CA 185	Vehicle speed measurement
TD 101	Traffic signalling systems
TA 101	Traffic signalling systems (appraisal)
TM 101	Traffic signalling systems (maintenance and operations)

All roads:

Traffic Signs Regulations and General Directions

HCC Model Contract Appendix 13/70 Closed Circuit Television

Traffic Advisory Leaflet 01/15 Variable Message Signs

IHE Guidance Note - Traffic Control and Information Systems

3.2. The following Technical Guidance Notes should also be referred to:

TG1 – Carriageway Cross Sections

TG2 – Alignment Design

TG3 – Stopping Sight Distances and Visibility Splays

TG4-1 – Traffic Signals

TG4-2 – Signal Controlled Crossings

TG10 – Footways / Cycleways / Shared Surfaces

TG14 – Road Restraint Systems and Passive Street Furniture

TG17 – Departures from Standard

3.3. Before the design of any ITS scheme is commenced, HCC's Highway Construction Details T series must be reviewed. These can be found on HCC's Highway Construction Standard Details web pages.

Other essential guidance/information includes:

- Requests for a Departure from Standard
- Technical Guidance
- Commuted Sums Policy

3.4. A Road Safety Audit (RSA) for the scheme as designed will be required. Technical Guidance Note TG18 provides information on the RSA process.

4. Traffic Information and Car Park Occupancy Variable Message Signs (VMS)

4.1. Background

4.1.1. The ITS Group will determine the requirement for Traffic Information and Car Park Occupancy Variable Message Signs (VMS) as part of a scheme (the majority of schemes will not require VMS). Contact the ITS Group at intelligent.transport.systems@hants.gov.uk for further advice.

4.1.2. The ITS Group will arrange for the design, procurement, installation and commissioning of Traffic Information and Car Park Occupancy VMS including their posts and foundations. This process is to use the County Council's term contract for traffic information installation.

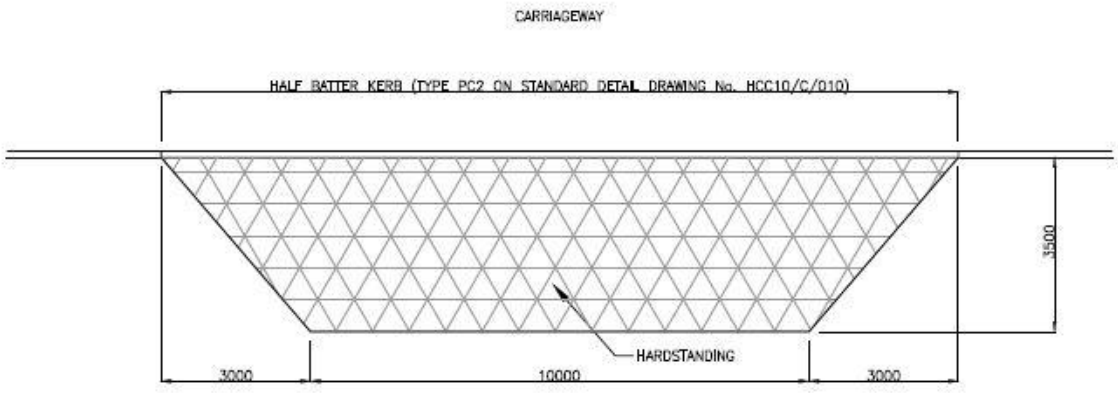
4.2. Design

4.2.1. When designing a Traffic Information and Car Park Occupancy VMS installation, careful consideration should be given to its location to minimise the risk of impact where possible. The designer shall assess the risk in accordance with TG14 – Road Restraint Systems and Passive Street Furniture, including careful consideration of the risk of secondary incidents occurring due to the falling VMS sign. The designer must fully consider the health and safety risks (as required by the Construction Design and Management Regulations) and cost implications of safe inspection, maintenance and repair of any system of protection proposed (e.g. High containment kerbs, passive posts or vehicle restraint system). Refer to TG14 - Road Restraint Systems and Passive Street Furniture.

4.2.2. The communications hardware for the VMS will be arranged by the ITS Group and charged to the scheme/scheme promoter.

4.2.3. The scheme designer is to ensure that safe and level access can be provided to install the VMS, their posts/columns and foundations. It is the scheme designer's responsibility to provide safe, level access hardstanding areas for people and their vehicles to maintain the VMS as part of the main scheme works. The post/column hardstanding shall only be installed after the VMS posts/columns have been installed.

4.2.4. A maintenance vehicle hard standing, with half batter kerbs, shall be provided adjacent to the VMS but outside of any Stopping Sight Distance/Visibility Splay. Dimensions shall be as shown in the diagram below unless agreed otherwise with ITS. Refer also to HCC's Standard Details - Notes for Guidance.



4.2.5. The construction of the hardstanding shall be suitable for the existing ground conditions and application proposed. Suggested systems can be found within Appendix 11/1 of HCC's Model Specification and should be included within that appendix or within the contract drawings.

- Where the maintenance vehicle hardstanding is located such that its likely to be used by vehicles as a parking area, a 'Authorised vehicles only' sign (Diag 829.6) with a 75mm x-height shall be installed at the back of the bay.
- Where a permeable product is used for the vehicle hardstanding and the hardstanding is surrounded by grass/vegetation, a white line to Diag 1010 is required along the channel for the length of the hardstanding to help denote its location. Where Diag 1010 can't be installed (i.e. where there are other lines required along the channel), the kerb batters along the length of the hardstanding are to be painted white instead.

4.2.6. Traffic Information and Car Park Occupancy VMS are to include hardstanding areas for maintenance vehicles adjacent to the signs. It is the scheme designer's responsibility to provide the vehicle hardstanding areas as part of the main scheme works. The vehicle hardstanding areas are to be provided before the VMS posts/columns are installed.

4.2.7. A scheme specific hazard assessment shall be produced by the ITS Group as part of the VMS design. The ITS Group shall produce the independent safety case review for the VMS.

4.2.8. The detail design submission package is to include an AutoCAD version (current version) of the VMS location including all associated 'xref' drawings. This will be used by the ITS Group to obtain a quotation for the ITS equipment.

4.3. Procurement

4.3.1. The costs incurred in the design, procurement and commissioning of the ITS equipment shall be charged against the scheme. For externally funded schemes the scheme promoter shall provide written confirmation of their acceptance of the equipment costs provided by the ITS Group prior to the

order being placed by the ITS Group. An interim invoice may be issued for the supply of materials. The costs will be invoiced to the scheme promoter for payment after commissioning of the equipment.

4.3.2. The ITS Group will arrange for a quotation for the ITS equipment and installation for all schemes (HCC and Developer led). This will only be arranged once the detail design has been approved. Once the quote has been verified the ITS Group will inform the scheme promoter of the overall quote value. It should be noted that the quote will exclude VAT and an administration fee. Please be aware that for commercial sensitivity reasons only the quantity of items and overall cost will be provided to the scheme promoter.

4.3.3. Specifically excluded from the quotation will be all civil engineering works including supply and installation of pole sockets, ducting, draw pits, power supplies, pillars and traffic management. The designer is to arrange for these works.

4.3.4. On receipt of the quote value, the scheme promoter is to provide a written letter of acceptance (containing the quote value) to the ITS Group accepting the cost. Other information to be included is:

- Billing address for the invoice
- VAT and company registration number
- Accounts payable telephone number
- Accounts payable e-mail address
- Work number or purchase order number

4.3.5. From receipt of the above letter of acceptance the typical lead-in time for the delivery of CCTV, VMS and Journey Time Monitoring Systems will be **10 to 12 weeks**. The lead-in time for specialist equipment may be longer and the ITS Group should be contacted for further information.

4.4. Construction Stage

4.4.1. Where a scheme requires the relocation or removal of an existing Traffic Information or Car Park Occupancy VMS, this will be arranged by the ITS Group.

4.4.2. The installation of the VMS, posts/columns and foundations will be arranged by the ITS Group. Traffic management for the installation of the sign will be arranged by the ITS Group.

4.4.3. An unmetered power supply is to be arranged by the scheme promoter for S278 schemes. For HCC capital schemes the unmetered power supply is to be arranged by the main design engineer. Confirmation of the site-specific power supply requirements shall be obtained from the ITS engineer for both S278 and HCC led schemes. An individual mains feed power supply shall be provided for each Traffic Information and Car Park Occupancy VMS location. Refer to standard detail drawing HCC11/T/070 for power supply requirements.

4.4.4. The power supplies are to be energised **before** the VMS are installed.

4.4.5. Where a vehicle restraint system is used that system is to be installed **before** the posts/foundations and VMS.

5. Closed Circuit Television (CCTV)

5.1. Background

5.1.1. ITS Group will determine the requirement for and location of CCTV as part of a scheme.

5.1.2. ITS Group will procure and arrange the installation/commissioning of the CCTV equipment. This process is to use the County Council's term contract for CCTV. For Developer-led schemes, when the scheme has S278 detailed design approval, the ITS Group will arrange for a formal quotation for the supply and installation of the CCTV system.

5.1.3. The ITS Group will determine the type of CCTV to be used at each location. CCTV shall be mounted on a dedicated CCTV column as specified by the ITS Group. The designer is to arrange for the CCTV column foundation to be designed and constructed.

5.2. Design

5.2.1. The ITS Group may arrange for a CCTV survey during the design process to help determine the preferred locations.

5.2.2. The type of communications for the CCTV are to be confirmed by the ITS Group and costs charged against the scheme/scheme promoter.

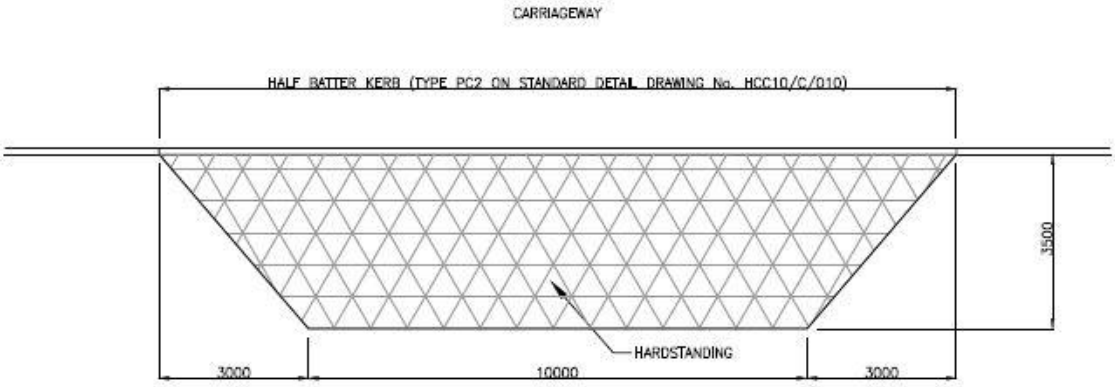
5.2.3. Where landline communications are required, the designer will be informed. In this situation the designer should allow for the installation of a suitable duct system connecting between the CCTV column and the main communications network. The designer should be aware that the detail of this duct system will not be known until the scheme is under construction and should make allowance for this in their scheme. The confirmed landline communications duct run shall be included on the final drawing.

5.2.4. Dedicated CCTV columns are to be used and the ITS Group will inform the designer of the size and height of the columns. The preference shall be for a wind down trolley pole column of at least 6 metres height. The mounting of CCTV cameras on traffic signal poles, either with or without signal equipment, shall be avoided. The designer is responsible for checking the suitability of the supplier's standard foundation detail for each individual column undertaking structural design checks. Where the standard foundation is determined to be inadequate for the site it will be the designer's responsibility to redesign the foundation. The foundation detail is to be checked by HCC's Engineering Consultancy Structures group – For external Developer schemes, this will be included as part of the S278/S38 Design Audit.

5.2.5. A separate cabinet shall be provided within 5 metres of the column which shall house the CCTV control hardware and communications. This shall

be used in preference to housing this equipment in the wide based column.

5.2.6. A maintenance vehicle hard standing, with half batter kerbs, shall be provided in close vicinity to the CCTV column and cabinet but outside of any Stopping Sight Distance/Visibility Splay. Dimensions shall be as shown in the diagram below unless agreed otherwise with ITS. Refer also to HCC's Standard Details - Notes for Guidance. Where the cabinet and maintenance hardstanding are located in a rural verge where the grass is unlikely to be regularly cut, the ITS Group may require a narrow footway to be installed between the controller and hardstanding. The footway specifications will be dependent on the site location and length required.



5.2.7. The construction of the hardstanding shall be suitable for the existing ground conditions and application proposed. Suggested systems can be found within Appendix 11/1 of HCC's Model Specification and should be included within that appendix or within the contract drawings.

- Where the maintenance vehicle hardstanding is located such that it is likely to be used by vehicles as a parking area, a 'Authorised vehicles only' sign (Diag 829.6) with a 75mm x-height shall be installed at the back of the bay.
- Where a permeable product is used for the vehicle hardstanding and the hardstanding is surrounded by grass/vegetation, a white line to Diag 1010 is required along the channel for the length of the hardstanding to help denote its location. Where Diag 1010 can't be installed (i.e. where there are other lines required along the channel), the kerb batters along the length of the hardstanding are to be painted white instead.

5.2.8. The designer shall assess whether a Vehicle Restraint System is required to protect the CCTV column. Refer to TG14 – Road Restraint Systems and Passive Street Furniture.

5.3. Procurement

5.3.1. Refer to section 4.3.

5.3.2. The detail design submission package is to include an AutoCAD version (current version) of the CCTV column and cabinet including all associated 'xref' drawings. This will be used by the ITS Group to obtain a quotation for the ITS equipment.

5.4. Construction

5.4.1. The scheme promoter is to include the construction of the CCTV foundation, column installation and commissioning process within the works programme. The programme is to ensure that the CCTV system is ready for commissioning before the scheme is opened and specifically in the case of traffic signals, before the signals are switched on.

5.4.2. For CCTV columns the fixing hardware will be supplied by the ITS Group. The foundation, including fixing hardware, are to be constructed by the scheme promoter. The CCTV column will be installed by the CCTV supplier arranged by the ITS Group. Traffic management is to be provided by the scheme promoter.

5.4.3. An unmetered power supply is to be arranged by the scheme promoter for S278 schemes. For HCC capital schemes the unmetered power supply is to be arranged by the main design engineer. Confirmation of the site-specific power supply requirements shall be obtained from the ITS engineer for both S278 and HCC led schemes. A power supply pillar and supply are to be provided within 5 metres of each CCTV column/camera. Refer to standard detail drawing HCC11/T/070 for power supply requirements.

5.4.4. The power supplies are to be energised **before** the CCTV cameras are installed.

6. Journey Time Monitoring Systems (Bluetooth)

6.1. Background

6.1.1. The ITS Group will determine the requirement for and coverage of a journey time monitoring system as part of a scheme.

6.1.2. The ITS Group will procure and arrange the installation/commissioning of the journey time monitoring system. This process is to use the County Council's term contract. For Developer-led schemes, when the scheme has S278 detailed design approval, the ITS Group will arrange for a formal quotation for the system.

6.2. Design

6.2.1. The ITS Group will determine the type of journey time monitoring technology to be used. The use of ANPR will no longer be supported. Bluetooth technology may be used or a virtual solution may be utilised using existing software. The Bluetooth-based solution shall use physical devices located at the road side to calculate journey times between fixed points. A virtual solution shall use software to gather journey times from other sources and requires no physical equipment.

6.2.2. The preference is for a virtual solution to ensure compatibility with the County Council's Urban Traffic Management and Control system. The ITS Group should be contacted for further information on the extent of the network coverage. Where a virtual solution is used the scheme shall include for a minimum of 5 years data supply in the procurement.

6.2.3. For a hardware based solution, the ITS Group will arrange for the power supply requirements where they are to be installed on existing street furniture. The journey time monitoring hardware would usually be installed on street lighting columns or traffic signal poles. Each individual location will be identified by the ITS Group.

6.2.4. Where the equipment is to be installed on street lighting columns the designer is to include for commando-type sockets to be installed on the columns. The ITS Group shall arrange for a quote and the supply of commando-type sockets, plugs, isolator switch within the columns and power supply to the commando sockets. The type of commando socket and its mounting height and orientation will be determined by the ITS Group.

6.2.5. The ITS Group shall be responsible for obtaining Consent to Attach from SSE for the installation of hardware to the street lighting columns.

6.2.6. The capacity of any street lighting column to accommodate the additional load from extraneous attachments needs to be checked and approved by the street lighting PFI service provider SSE

(http://www.lightsoninhampshire.co.uk/Public/TPA-Information.aspx).
Refer also to Technical Guidance Note TG13 – Street Lighting.

6.3. Procurement

6.3.1. Refer to section 4.3.

6.4. Construction

6.4.1. Communications for hardware based solutions are to be arranged by the ITS Group.

6.4.2. Where an existing street lighting column which houses journey time monitoring hardware equipment is to be replaced, removed or relocated the designer is to contact the ITS Group during the detail design stage to arrange an alternative location. The ITS Group shall be notified of any equipment that is required to be removed from a street lighting column and will make arrangements for its removal. Inspection of the column by SSE shall be arranged by the ITS Group and any damage to the paint/protective coating of the column will require making good. If a commando socket is to be removed then the cable-entry hole will need to be sealed appropriately as detailed following the inspection. The ITS Group shall be advised that such removal is required and will make arrangements with SSE for its removal together with the power cable and isolator which ITS Group/SSE shall retain for re-use. Costs for this work shall be re-charged to the Scheme.

7. Further Support

7.1. Should you have a specific query or feedback about any of the content of this Technical Guidance Note 4-3, please send an email to technical.guidance@hants.gov.uk with the start of the email title as "TG4-3 – [subject of email]".

7.2. Should you have a query about applying this to your particular project, please contact:

- the Design Audit Engineer dealing with your S278 or S38 application (if you are a Developer or Developer's Consultant)
- the Technical Guidance Note Specialist(s) (if you are a working within Hampshire County Council)

7.3. Associated Technical Guidance Notes:

- TG1 – Carriageway Cross Sections
- TG2 – Alignment Design
- TG3 – Stopping Sight Distances and Visibility Splays
- TG4-1 – Traffic Signals
- TG4-2 – Signal Controlled Crossings
- TG10 – Footways / Cycleways / Shared Surfaces
- TG14 – Road Restraint Systems and Passive Street Furniture
- TG17 – Departures from Standard
- TG18 – Road Safety Audit