

Chapter 11 Managing Use of the Road System

11.1 Introduction

This Chapter provides an overview of the issues affecting the management of the road system, covering:

- all uses, including by those not actually travelling;
- institutional issues and policies;
- design and management techniques; and
- objectives and consultation.

In particular, it addresses the importance of developing a functional hierarchy for road systems in urban areas.

11.2 Use of the Road System for Transport

The historic purpose of the public highway is for the passage of people and goods. The public at large enjoys long-established rights to pass and repass and to gain access from the public highway to adjacent property. In urban areas, however, the exercise of these rights has to recognise that users of vehicles and adjacent property often need to load and unload passengers and goods on the highway and would like to park their vehicles there. Moreover, highways often incorporate paved public open space and they are used for many non-transport purposes, as discussed in Section 11.3. The highway is also one of the principal physical elements of the urban environment, influencing its layout, shape, form and appearance.

This mixture of uses, the pressures of traffic growth, the importance of providing for walking and cycling as well as motor traffic and public concern for the urban environment have led to a range of powers and techniques for managing the use of the road system for transport. Rights of passage on foot are largely unrestricted but vehicular use can be regulated in many ways, as well as being influenced by layout and detailed design. For these powers and techniques to be used to good effect, it is important to bear in mind some basic characteristics of movement in urban areas.

All premises and areas of land require access on foot and sufficiently close access by particular categories of motor vehicle to enable people with impaired mobility, the emergency services and those delivering heavy or awkward items of goods to reach them. Providing such access will usually also enable access

by bicycle. The need and justification for more general access by motor vehicles of various kinds depends upon the nature of the activities carried out at the premises or on the land, the space available for vehicles within and near the site and the competing demands of other uses for the relevant parts of the highway. Where the scope for vehicular access is limited, it may be appropriate to provide closer access for public transport and service vehicles than for private cars. Service vehicles and private cars used for access by their drivers usually need to be parked near their destinations, which often results in parking being a major use of highway space.

A vehicle which needs to gain access via particular streets near to the origin and destination of its journey is, nevertheless, part of the 'through' traffic on each other road or street that it uses on the way. The essential difference between 'through' and 'access' traffic is that, whereas traffic requiring access to premises served by a given street has (by definition) to use that street, through traffic can usually avoid that particular street by taking a different route, if there is sufficient reason to do so.

In general, the longer the journey a vehicle is making, within or through an urban area, the wider is the range of alternative routes and the greater the scope for managing the driver's choice of route, in the interests of the local environment and traffic safety. This can involve encouraging through traffic to use longer routes than the most direct that was previously available. The extra distance involved is usually only a small proportion of the whole journey for long-distance traffic but the proportionate inconvenience and extra cost can be larger for more local traffic. Even so, the inconvenience of diversion is less for users of motor vehicles than for pedestrians and cyclists, whose routes should be kept as direct as is practicable. Design, to provide appropriate routes for traffic of all kinds, is helped by the concept of a functional hierarchy of roads and routes, as discussed in Section 11.7.

11.3 Non-Transport Uses of Street-space

Streets can provide valuable communal space, where people can congregate, sit or take a stroll (see Photograph 11.1), and where trading, entertainment

and ceremonies can take place, children can play outside and other activities can spill over from adjacent premises. Indeed, relaxed informal use of streets and squares is one of the hallmarks of a mature society and, in more densely developed areas, the street has to be seen as part of the living space for people who live and work in the area, as well as a thoroughfare, and local access streets should be adapted to give priority to these non-transport uses. Deliveries, servicing and access by car can take place from parking places suitably located in the street or nearby.

Some main thoroughfares are also likely to be centres of attraction for non-transport uses. Shopping streets



Photograph 11.1: Communal street space in the centre of a small town.



Photograph 11.2: Space for window-shopping, meeting and talking – all vital functions of a footway.

need sufficient footway space for window shopping, as well as movement (see Photograph 11.2). These are also the places where entertainment attracts crowds and there may sometimes be parades or large crowds of, say, Christmas shoppers. Good design and management can help to reduce conflict between these activities and the use of the street for movement of people, public transport, essential services and other vehicular traffic.

Public utility companies (ie gas, water, electricity, telephone etc) enjoy rights to occupy space beneath the surface of the highway and to gain access to that space from time to time. This underground use of the street can sometimes be just as important as the traffic passing over it and the presence of underground services can severely constrain tree planting and lead to the physical restriction of access by vehicles. The statutory undertakers' occupation of the highway and access to apparatus is regulated through the New Roads and Streetworks Act (HMG, 1991) and they are required to reinstate the street as they find it.

Recreational use of vehicles on the highway can be tolerated, regulated or prohibited depending on the type of road and vehicle-use. Bicycle time trials and some racing is conditionally permitted. Some motor sport is allowed but road-racing and the closure of roads to traffic to facilitate such activities is not usually permitted.

Roadside advertising is under the control of the Local Planning Authority and is permitted on some parts of some highways in consultation with the Highway Authority.

11.4 Context for Managing Use of the Road System

The broad policy framework for each area is set out in the Authority's approved Plan (see Chapter 4). This will generally cover key areas of transport policy and, in particular, the relationship between new developments and transport [NIb].

Each local highway and traffic authority must submit, to its regional Government Office, its annual Transport Policies and Programme (TPP), in which its current policies are summarised [NIc] [Sa] [Wa]. District Councils are encouraged to address the need for transport policies, in support of sustainable development, including provision for alternative modes of transport to the car, in their Local Plans, through the Structure Plans for that area and policy guidance by the Departments of Transport and the Environment (see Chapter 4) [NIId] [Sb] [Wb].

Towns and cities have developed as centres of economic and other activities which depend on transport, largely by road. But road traffic is only a means to an end. Unmanaged, it can choke the very urban life that it serves. The dilemma is how to manage demand for access and movement and yet maintain prosperity and economic growth. Traffic management is one of the principal means of managing the demand for use of the roads and the context for its use for this purpose is illustrated in Figure 11.1. Traffic management techniques have been developed to manage congestion, to give more space on the streets to people on foot, to improve road safety, to reduce the adverse impact of road traffic on the local environment and, in all these ways, to improve the quality of urban life and help to maintain the viability of town centres.

Concern for the environment and the effect of traffic pollution on health have combined with concerns about road safety to create public demand for more radical and innovative approaches to tackling the perceived threat from increasing traffic. To convert these concerns into public support for practical and broadly acceptable traffic management policies and schemes in the local circumstances of each town or city requires effective partnerships between highway and planning authorities, developers, local businesses, public transport providers, community groups, road-user groups, the emergency services and enforcement agencies.

11.5 Objectives, Priorities and Resources

Objectives

Traffic management can be used to achieve some or all of the following objectives:

- ❑ reduction in casualties and physical damage through traffic accidents;
- ❑ assistance to those walking, cycling and using public transport;
- ❑ improvement of the local environment;
- ❑ improved access for people and goods; and
- ❑ improved traffic flow on main roads.

These objectives often conflict and balances have to be struck, which are appropriate for a particular road or area, but almost all traffic management has a bearing on road safety and the environment. The secondary effects and consequences of schemes designed to achieve specific objectives should always be considered.

Traffic management may also form an integral part of schemes to achieve wider objectives, such as urban regeneration, environmental improvement or development projects, or to complement the construction of new road or public transport infrastructure.

Priorities

The general policies and needs of a particular area are likely to have been identified, in broad terms, through the structure and local planning process and

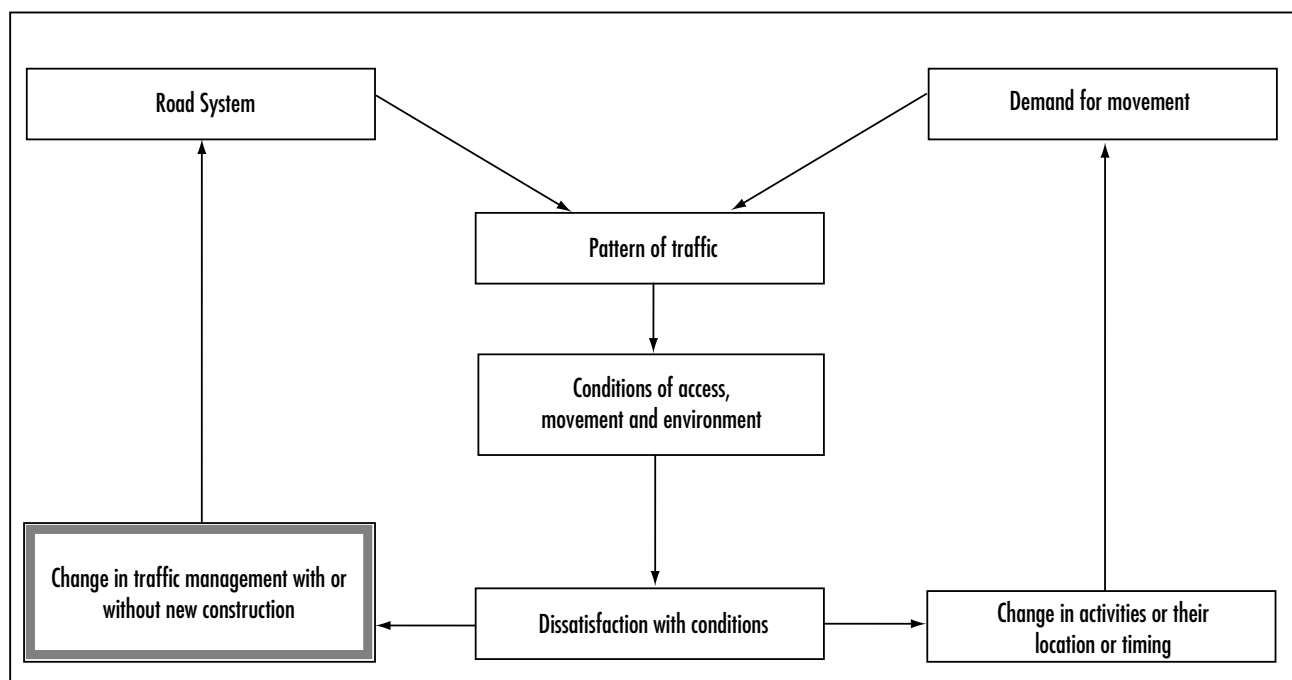


Figure 11.1: The context for traffic management.

transportation planning policy statements. However, it is essential to identify priorities in some detail and to test public acceptance of these at an early stage in the design of specific traffic management schemes.

It may help to identify the relative priority to be afforded to different groups of affected people, such as residents, shoppers, employees, service traffic, cyclists or people with impaired mobility. Without clearly expressed objectives for a particular scheme or set of regulations, it can be difficult to resolve objections and to resist pressure for exemptions.

With respect to some objectives, such as road accident reduction, effectiveness can be quantified and measured with confidence. Other objectives, such as environmental improvement or encouragement of cycling, are more nebulous or may not show results in the short term. Since prioritisation of these objectives is necessarily subjective, it is essential that decisions as to the most appropriate allocation of resources is guided by clear analysis of likely cause and effect.

There will often be pressing calls for traffic management work to meet short-term needs and this can frustrate the achievement of broader or longer term objectives. Clear establishment of objectives and priorities is essential if progress is to be achieved.

Resources

Traffic management is essentially low cost compared with the provision of new infrastructure. The most significant input is often skilled human resources. The resource cost of staff time required to research, survey, specify and consult on regulations may well exceed the actual cost of implementation of the scheme concerned. However, even when these costs are taken into account, traffic management schemes can offer high rates of return. Moreover, modest resources allocated to, say, closure of a shopping street to through traffic may provide the key to releasing other resources for environmental improvement.

11.6 Legislation, Regulatory Powers and Procedures and Funding Arrangements

Legislation

Traffic management is undertaken under powers given by, and subject to, the provisions of the Highways Act 1980 (HMG, 1980) [Sc], the Road Traffic Regulation Act 1984 (HMG, 1984), the Road Traffic Act 1988 (HMG, 1988) and the New Roads and Streetworks Act 1991 (HMG, 1991). Related powers

are also contained in the Town and Country Planning Act 1990 (HMG, 1990) [NIe] [Sd]. These Acts are amended and supplemented from time to time by more specific Acts and are implemented in detail through secondary legislation, especially Commencement Orders, that bring particular provisions into effect on specified dates, and Statutory Instruments (SIs), which often include detailed regulations, specify procedures and keep matters of detail up to date. Much of the legislation is interpreted by the relevant Government Departments, in circulars and other forms of advice to local authorities.

Because of the complexity and changing nature of the law relating to highways and traffic, practitioners are strongly advised to consult one of the regularly updated Law Encyclopedias (eg Sweet and Maxwell). Not only do the encyclopedias give convenient cross-references to commencement dates, amendments and SIs but they also include relevant case law, which illustrates how statutes are to be interpreted. In this field, simplified text books on highway and traffic law should be used with care, as they cannot present an up-to-date statement of the law (Orlik, 1993).

Regulatory Powers and Procedures

Local authorities, in their role as traffic and highway authorities, may only exercise powers and carry out duties specifically laid down in legislation. Government Ministers and their Departments are similarly constrained. In general, central Government avoids direct involvement in purely local issues but it is sometimes possible for local authorities to act outside their normal powers, with specific approval of Ministers. Secretaries of State generally have reserved powers, which are much wider than those given to local authorities [NIc]. Details of powers and procedures are given in Chapters 4 and 13.

Regulations which cannot be enforced effectively or which seriously overload the capacity of the police and the court system, force these agencies to determine priorities. Close co-operation with the enforcement agencies is essential, if the objectives and priorities of highway authorities are to be achieved in practice. The police generally prefer the use of physical controls and the use of simplified procedures to consolidate traffic regulations.

Funding

Central Government influences local transport expenditure, after considering the merits of proposals submitted [Sa] in each authority's annual (TPP) submission and the available national resources [Wc].

Local transport packages and local safety schemes are selected for funding approval through Supplementary Credit Approval (SCA), which authorises borrowing. Central funding, called Transport Supplementary Grant (TSG) [Se], may be available for substantial traffic management schemes (over two million pounds) and currently runs at 50%. It therefore needs to be supplemented from local taxation and other sources to enable an authority to carry through a balanced programme of transport management work on the roads for which it is responsible [Nif].

Authorities have also come to depend on other sources of revenue income, private sector funding and assistance for research and demonstration projects to supplement grants and local authorities' own funds (see Chapter 4). These sources may include:

- ❑ income from car parking charges, but this can only be used for specific purposes (see Chapter 19);
- ❑ developers' contributions, generally to relieve existing constraints or to accelerate projects so as to enable traffic-generating developments to proceed;
- ❑ central Government and EU-sponsored innovative, experimental or demonstration projects;
- ❑ European Regional Development Fund (ERDF) grants, in eligible regions (and transport infrastructure is likely to be eligible from 1997); and
- ❑ transport investment that is part of a wider plan, such as for regeneration or housing improvement, where authorities may be able to draw in funds from other Government sources.

11.7 Hierarchy of Roads for Motor Vehicles and Routes for Pedestrians and Cyclists

The design or adaptation of the road system in a town or city, to provide for the mixture of transport and non-transport uses mentioned in Sections 11.2 and 11.3, can be realised by applying the concept of a functional hierarchy of roads for motor vehicles, integrated with a system of routes for pedestrians and cyclists (see Photograph 11.3). The functional hierarchy of roads stems from the need to reconcile, in a single design for a road and pathway network, the functions of providing for efficient movement of motor vehicles with those for other transport and non-transport uses. It is strongly influenced by the idea that any motor vehicle travelling between a particular origin and destination should intrude as



Photograph 11.3: Segregation of pedestrians, cyclists and road vehicles.

little as is practicable into the neighbourhoods and living areas that it has to pass through on its journey. However, this idea may be fully achievable only in new development areas (see Part IV).

Principles and Advantages of a Functional Hierarchy

The provision of access to sites and buildings and their immediate surroundings should, if possible, be separated from the provision for the through movement of motor vehicles. More generally, the conflicts between different functions of the road system can be reduced by designing or adapting the various roads and paths in an urban network, so that mutually-incompatible functions are, as far as is practicable, separated onto different roads and the network as a whole provides safely and conveniently for the desired mixture of uses.

With this in mind, the mixture and balance of functions to be performed by each road needs to be identified, so that it can be designed or adapted accordingly. The resulting design should reinforce the intended balance of functions, by encouraging the appropriate uses and behaviour and by discouraging incompatible uses and behaviour. Features that can contribute to the design include: alterations to the width and alignment of carriageways; footways; cycle-tracks; the layout of the carriageway, including any parking places; signing; marking; lighting and street furniture; speed-limits and other traffic regulations; and the choice of surface materials and landscaping.

Among the advantages of this approach are that:

- ❑ more space can be given to activities most closely related to frontage buildings, where the functions of communal space and access predominate;

Functions	Routes for non-motor traffic				Roads for motor vehicles:		
	Cycle Routes	Pedestrian Routes	Pedestrian Streets	Access roads	Local Distributors	District Distributors	Primary Distributors
Predominant Activities	Cycling	Walking Some cycling in shared space	Walking Meeting Trading	Walking Use of highway by frontagers. Vehicle access. Delivery of goods and servicing of premises. Slow moving vehicles	Vehicle movements near beginning or end of all journeys	Medium distance traffic to Primary Network Public Transport services. All through traffic between different parts of the urban area	Fast moving long distance through traffic No pedestrians or frontage access
Pedestrian Movement	Considerable freedom to cross and priority over cyclists on shared pathways	Complete freedom - priority over cyclists and motor vehicles in shared space	Complete freedom	Considerable freedom with crossing at random and some areas shared with vehicles	Careful consideration of opportunities for crossing	Minimum pedestrian activity with positive measures for their safety	None - vertical segregation between vehicles and pedestrians
Cycling	Priority over pedestrians and motor vehicles in shared space	Permitted in shared space but priority there should be given to pedestrians	Generally acceptable but may be restricted if pedestrian usage is high	Shared use of area available to vehicles	Assisted by provision of cycle lanes if possible	Cycle lanes, and help in turning right should be provided, if alternative cycle routes are not available	None - alternative routes for cyclists should be provided
Stationary Vehicles	Only in parts of carriageway not designated specifically for cyclists	Only in shared space and not so as to obstruct pedestrians	None except for servicing, emergency and access by people with mobility handicaps	Considerable, if space not provided off the highway	Appreciable, if space not provided off the highway	Some, depending on traffic flow conditions	None
Heavy Goods Vehicle Activity	Only in parts of carriageway not designated specially for cyclists	None	Essential servicing and frontage deliveries only	Only for delivery of goods and services	Only to serve frontage premises and reach nearby access roads	Movement between different parts of the urban area	Suitable for all through movements
Vehicle Access to Individual Properties	Only with consideration for cyclists	Only via shared space or across footways	None, except for emergency vehicles and necessary access for servicing and by people with mobility handicaps	Predominant	Some to frontage premises and sites	None, apart from sites generating vehicle flows at levels similar to those on local distributors	None apart from sites of national traffic importance, with purpose -designed access.
Local Vehicular Movement	Some on lightly trafficked routes with consideration for cyclists	None	None except where public transport vehicles are admitted	None	Predominant	Some, according to spacing of junctions	Very little - junction spacing should preclude local movements
Through Vehicular Movement	None	None	None	None	None	Predominant role for medium distance traffic	Predominant role for long distance traffic
Vehicle Operating Speeds and Speed Limits	Less than 20 miles/h with speed-reducing measures	Less than 5 miles/h except for careful cycling on shared pathways	Less than 5 miles/h (vehicles enter on sufferance)	Less than 20 miles/h with speed-reducing measures	Subject to 30 miles/h limit but layout should discourage speed	Subject to 30 or 40 miles/h limit within the urban area	More than 40 miles/h depending on geometric constraints

Table 11.1: Functions of an urban hierarchy.

Source: Adapted from USM Guidelines.



Photograph 11.4: A pedestrianised street – part of the civilising of towns.

- ❑ pedestrians, cyclists and public transport can be provided with more convenient and attractive routes, in reduced conflict with other traffic;
- ❑ activities incompatible with traffic flow increasingly can be accommodated elsewhere than on designated traffic routes;
- ❑ acceptance can be gained for segregation of traffic and limitation of access, to increase the capacity of designated traffic routes;
- ❑ accidents can be reduced by minimising the number of intersections and vehicular conflicts on designated traffic routes and making safe crossing-places for pedestrians where they find it natural to cross;
- ❑ environmental impacts of motor traffic can be limited by concentrating flows onto fewer routes designed for smoother flow; and
- ❑ where it is decided to invest in extra infrastructure for moving traffic, the rate of return on such investment can be increased by concentrating traffic onto a few selected corridors.

A Form of Hierarchy

The form of hierarchy which has evolved from the one originally set out in the Buchanan Report (Buchanan *et al* 1963) is summarised in Table 11.1. Among the four main categories of road for motor vehicles, the two middle categories are less clearly distinguished than the two ‘extremes’ of access roads and primary distributors and their roles have to be interpreted flexibly in relation to local circumstances. It is more important to achieve a good match between design and intended mix of functions than to strive to comply with

the description of a preconceived category of road. Many small and medium-sized towns, for example, will have no need for primary distributors within the urban area, although they will require good access to the local primary network. The number of categories of road in the hierarchy will depend on the size and population density of the urban area concerned.

Routes for pedestrians usually comprise a mixture of footpaths apart from roads, pedestrian-only streets (see Photograph 11.4) and footways along-side roads, with different degrees of separation from the carriageway. Crossing of carriageways can be assisted in ways ranging from dropped kerbs to grade separation. Similarly, routes for cyclists comprise a mixture of cycle-paths apart from roads, special facilities along roads and at road junctions and, ideally on quieter roads only, cycling in mixed traffic (see also Chapters 22 and 23).

Developing a Hierarchy in Practice

A new settlement or a substantial area of redevelopment in an existing town or city can be provided from the outset with a network of roads and paths, in which design and resulting functions are closely matched, especially if there are few constraints and if densities are low.

In a more dense town or city, the existing pattern of land-use has to be serviced by an affordable adaptation of the existing network, much of which may have developed in haphazard ways over the history of the settlement. The initial definition of a hierarchy will necessarily have to be a practical compromise but identification of the current mixture of functions of each road and the scope for modifying it, over a period of time, is an important starting point for subsequent decisions about traffic management and development control, especially as it affects frontage access (see Chapters 13 and 27). Coherent policies and decision-making in these two respects over a period of time can do much to reduce the conflict between incompatible functions and inconsistency between physical form and the mix of functions on the various roads in the network and to enhance the provision of safe and convenient routes for pedestrians and cyclists.

As part of this process, incompatible functions, that still have to be performed by the same road, can sometimes be separated in time. For example, on a stretch of main radial road, which also serves as an inner suburban shopping high-street, a peak-hour bus-lane may, at other times, provide kerbside space for delivery vehicles servicing the shops and short-stay parking for shoppers.

The hierarchy as currently defined, and the identified

scope for changing it, together provide one of the starting points for the design of traffic management schemes, including traffic calming and local-area safety schemes (see Chapters 20 and 16). As with all such schemes, however, the proposed hierarchy within the area affected by the scheme should be open to modification in the light of consultation with local people and affected road-users.

Statutory Definitions and Administrative Categories of Road

It is important not to confuse the functional hierarchy of a road network with the various statutory and

administrative categorisations. In the functional hierarchy, roads and paths are categorised in terms of actual or intended uses within the network as a whole and as an aid to design, adaptation and management, irrespective of which authority is responsible for any particular road. Statutory and administrative categorisations are made for quite different purposes, some of them according to which authority is responsible for maintaining particular roads within the network. A number of relevant definitions are brought together for reference in Tables 11.2 [NII] and 11.3 [NIm]. Any association between these and the functional categories in Table 11.1 is circumstantial and subject to many exceptions.

Definitions	Additional Information
<u>A Highway</u> is a way over which the public have the right to pass and repass.	On some highways, this right of passage may only be exercised on foot, on horseback or by specific classes of vehicles (as described by any Order which may be applicable). Public highway refers to those highways which are maintained at public expense (ie by the highway authority). Highways not maintainable at public expense are none the less highways. A highway may also be a waterway, a navigable river or road ferry. The term highway maintainable at public expense roughly corresponds to roads maintained by the road authority in Scotland.
<u>A Carriageway</u> is a highway or part of a highway over which the public have right of way for vehicles.	These rights may be restricted by the implementation of a traffic regulation, speed-limit or other Orders, such as one giving special road status (see Table 11.3). The right of way for vehicles does not detract from the established right of pedestrians to cross the carriageway.
<u>A Footway</u> is that part of a highway which also comprises a carriageway, over which the public have right of way on foot only.	—————
<u>A Footpath</u> is a highway over which the public have right of way on foot only, not being a footway.	The essential difference between a footway and a footpath is that the former is adjacent to a carriageway. A way which is exclusively for passage on foot is a footpath.
<u>A Bridleway</u> is a highway over which the public have right of way on foot and on horseback.	The right of way may also apply to leading horses or driving animals, in which case it may be known as a driftway.
<u>A Cycle Track</u> is a way which is part of a highway over which the public have right of way on pedal cycles, other than pedal cycles which are motor vehicles, with or without the right of way on foot.	—————
<u>A Road</u> in England and Wales is any length of highway or any other road to which the public have access and includes bridges over which a road passes.	However a highway may be designated as a 'Special Road', a 'Trunk Road' or a 'Principal Road' (see Table 11.3).

Table 11.2: Statutory definitions for terminology (England and Wales) [NII] [Si]. Source: RTUA, (IHT, 1987) page 35.

11.8 Elements of Urban Road Layout Contributing to Management of Use

The principal components of the urban road network are lengths of road (Chapter 36), road junctions (Chapters 37 to 43), footpaths (Chapter 22) and cycle-paths (Chapter 23). A length of road comprises some or all of carriageway, footway, cycle-track, surface shared by different users, verges and accesses to frontage or other nearby premises. There may also

be a central reservation and a reserved area for light rail vehicles. All of these elements of a length of road have their counterparts at road junctions, although accesses to premises at a junction are exceptional. Footpaths and cycle-paths provide rights of way for pedestrians and cyclists, along alignments where there is no right of way for motor vehicles. A footpath and cycle-path can share the same surface, provided that the relevant powers are invoked (see Chapter 23).

The design and operation of each of these elements is discussed in the relevant Chapters. The principles

Definitions	Additional Information
A <u>Trunk Road</u> is a highway which constitutes part of the national system of routes for through traffic and for which the Secretaries of State for Transport, Wales and Scotland respectively are the highway authority.	_____
A <u>Principal Road</u> is a non-trunk road, which is classified as such by the appropriate Secretary of State as being sufficiently important in the national highway system to justify principal status.	Principal road status is currently less important than it once was. It is still used as one element in the determination of the level of grant to local highway authorities and is important in some legal procedures, such as the making of or alteration to, speed-limit Order and is used by some highway authorities to specify and delegate functions to agency authorities.
A <u>Classified Road</u> is a highway, which is agreed by the Secretary of State and where appropriate the local highway authority as being of importance to the movement of traffic.	Classified Roads may be either I, II, or III. All Class I and II roads and some Class III roads are given numbers. Class I, II and III generally coincide with the prefix A, B or C respectively although there are some exceptions to this. Numbers are allocated according to the relationship between the origin of the road and the sectors of the country created by the main routes from London (A1-A6) and Edinburgh (A7-A9).
A <u>Primary Route</u> is a route that is designated by the appropriate Secretary of State as the most satisfactory all-purpose route for through traffic between two or more places of traffic importance.	Primary routes have green background direction signs for non-local destinations. A list of primary destinations is given in the Traffic Signs Manual Chapter 2. Motorways are not primary routes because they are 'special roads' and therefore not available for use by all traffic. A trunk road need not necessarily be a primary route.
A <u>Special Road</u> is a road designated by an Order made by the appropriate Secretary of State, which restricts its use to certain classes of traffic.	The most common type of special road is a motorway whereby pedestrians, animals, pedal-cycles etc. are prohibited. Roads other than motorways may be designated a 'special road'. Another important feature of special roads is that public utilities do not have a statutory right to place their apparatus within a special road.
A <u>Motorway</u> is a particular type of special road where motorway regulations apply.	All motorways are special roads but not necessarily trunk roads.
An <u>All Purpose Road</u> is any road other than a special road i.e. a road which is not restricted by a Special Road Order.	_____
A <u>Designated Road</u> (within London) is a non-trunk road designated by the Secretary of State because of its importance	All highway and traffic proposals on or affecting these roads have to be cleared by the Secretary of State.

Table 11.3: Classification of highways according to their status as traffic routes [Nlm]. Source: RTUA (IHT, 1987) page 36.

and standards applying to their design allow each element of a particular network to contribute appropriately to the management of use of the network as a whole, in accordance with the functional hierarchy.

Junctions are critical in determining the capacity of urban networks and the ways in which queues of vehicles form at the various junctions can have a strong influence on the routes that drivers choose to take. The layout and, where there is signal control, the signal-timings at each junction can be used to favour some movements of vehicles and pedestrians and to discourage others. This can include giving priority to particular types of vehicle, such as buses or bicycles. At congested times and places, they can also be used to cause the resulting queues to form at places where they are less disruptive and intrusive than they might otherwise be. The design of junctions can also be used to alert drivers to the need to adopt a different style of driving, notably in respect of speed. A roundabout, for example, can usefully mark the change from a relatively spacious suburban radial road to more constricted conditions prevailing nearer to the centre of a town. The junctions between a main radial road and local distributors leading from it into residential areas can be designed to ensure that vehicles entering the residential area do so at a low speed, appropriate to their new surroundings. In appropriate cases, wide vehicles can be excluded physically, provided that alternative means are available for necessary access, especially by the fire service (see also Chapters 37 to 43).

Most lengths of road in urban networks can carry more vehicular traffic than can enter the next junction downstream, so there is scope for reallocating some of the road-space between junctions to balance the functions that the length of road is intended to perform. Kerbs, surface colour and texture, street furniture and landscaping can all play a part in this, as well as any necessary signs and markings. Even on roads where the vehicle-flow function predominates, there is often room, except on the approaches to major junctions, to allocate space to extensions of the footway, bus-boarders, sheltered parking and loading bays, landscaping to shield pedestrians from motor vehicles and cycle-lanes or separate cycle-tracks, as well as to accommodate those frontage accesses for which no alternative can yet be arranged. Where local traffic distribution or access functions predominate, non-transport functions, such as providing communal space, may be correspondingly more important. Space can accordingly be allocated to footways, to cycling (see Photograph 11.3), to parking spaces that contribute positively to the layout as a whole (see Photograph 11.5), to appropriate speed-reducing features (see Photograph 11.6) and to



Photograph 11.5: Road-space allocated to parking.

landscaping (see Photograph 11.7). On access roads, the use of functionally-designed shared surfaces is often appropriate.

On roads of all kinds, except motorways or sections of near-motorway standard, the layout of footways, cycle-tracks and other facilities for cyclists, pedestrian and cycle-crossings should all contribute to natural, direct and attractive routes for the journeys that pedestrians and cyclists wish to make, minimising their conflicts with heavy flows of motor traffic and including good access by pedestrians to public transport stops. These elements of pedestrian and cycle routes should be complemented by



Photograph 11.6: Features designed to reduce vehicular speeds.



Photograph 11.7: Landscaping incorporated with traffic calming.

footpaths and cycle-paths away from roads. Such separate paths should be well-surfaced and well-lit, and should be designed to achieve a correct perception of personal safety that will encourage their use at all times of the day and night. Where appropriate, the needs of equestrians also require to be considered and accommodated.

11.9 Quality of Design and Construction

Opportunities to change, substantially, the visual character of an existing street or urban space do not

occur often. Major traffic management schemes may provide this opportunity but almost always affect some users adversely. If the public are to accept and support change, the deciding factor for many may well be the way in which the opportunity to change the character of the environment is presented. Less convenient vehicular access and movement for some users may be considered a price worth paying if the environment can be improved markedly. However, this can be difficult to steer through the political decision-making process.

Experimental schemes, to determine the acceptability of measures, tend to reveal the importance of using quality materials and street furniture. Unfortunately, delays in funding or in agreement on a permanent scheme can result in temporary structures or materials being retained for too long and requiring labour-intensive maintenance. The poor appearance of a temporary or experimental scheme can often militate against its retention in permanent form. Clearly, there is a need continuously to monitor experimental schemes and to deal with problems as they arise. Traffic-calming schemes, often readily accepted in principle, can also founder if their detailing is poor. The first test of any material used in the harsh public highway conditions must be its durability and ease of maintenance, including reinstatement by utility companies.

The changing nature of city centre streets, as places to linger and as places for street entertainment and shopping, calls for a variety of street furniture.



Photograph 11.8: Co-ordinated design in an area-wide traffic-calming scheme.



Photograph 11.9: Prioritised allocation of road space.

Co-ordination of the design and appearance of street furniture can do much to create a sense of place. Throughout urban areas, the design of street lighting, bus shelters, guard-rails, bollards, seats, cycle-tracks and so on merits attention because co-ordinated design can do much to raise the quality of the street scene (see Photograph 11.8). Well-designed robust planting boxes and guarded semi-mature trees can help to define urban spaces. All this costs money but, through careful choice of materials and good co-ordinated design, a new sense of place can be created to revitalise pride in a town, neighbourhood or street, to encourage people to enjoy their urban surroundings and to linger (DOE, 1992 and MOT Denmark, 1993) (see also Chapters 12 and 17).

11.10 Management of Access and Movement

Access to and from the public highway network is a basic requirement for virtually all activities. Urban areas consist of a complex mixture of interacting land-uses, which usually include well-defined residential, shopping and industrial areas but also areas of mixed and, sometimes, conflicting land-uses. Often schemes are needed which will achieve the best compromise between access requirements and an acceptable environment (see Photograph 11.9).

Priorities for Access

Where there is particular conflict between access and quality of environment, it is often helpful explicitly to identify and to agree priorities for access. These may differ by time of day and reflect factors such as availability of public transport, alternative car

parking provision and the need for vehicles to continue to use streets for goods deliveries, for example. Chapter 21 discusses various techniques for the management of demand. When determining priorities for access, consideration needs to be given to emergency services, people with impaired mobility, servicing, goods deliveries and to parking, whose management is discussed in Chapter 19.

In residential areas, access needs are likely to predominate over those of through traffic. Comprehensive traffic calming, considered in Chapter 20, can create conditions in which some road-space can be reallocated for parking by residents and their visitors, as well as for cyclists and pedestrians and for planting.

Priorities for Movement

The degree to which freedom of movement by private car can be accommodated will be determined by the capacity of the street network and local environmental objectives. In most cases, encouragement of public transport, cycling and walking will be seen as priorities. Restraint through parking policies, reductions of road-space for general traffic and, possibly, road-use pricing may be necessary to discourage excessive car traffic. Selective management of goods vehicles may also be required, as discussed in Chapter 25, to reduce obstruction of movement and to improve the environment. In some areas, where acceptable alternative routes exist or can be provided, through traffic may need to be removed from sensitive areas and the opportunity taken to improve the area. Where public transport is positively encouraged, priority can be provided, as discussed in Chapter 24.

Once priorities have been clearly established and agreed, traffic management schemes can be developed to restrain as much of the low priority



Photograph 11.10: Car/bus transport interchange – sparsely equipped and exposed to the elements.

movement as is necessary to inhibit congestion. Personal movement on foot or bicycle should be as direct as possible, to encourage the use of these modes, and convenient routes for people with impaired mobility should be provided.

Good location and design of transport interchanges can encourage the transfer of journeys from private cars to forms of transport which make less demands on urban road space (see Photograph 11.10). Access to town centres by bus can also be given preference, by providing stopping places closer to the main attractions than the central area car parks.

Conflict between Movement, Access and Parking

The degree to which increased frontage access and parking can be accommodated will generally be a reflection of the balance of functions of a particular road. Uncontrolled access from the kerbside can impede traffic flow and reduce safety (see Photograph 11.11). Frequent turnover of kerbside parking space can also disrupt through movement. Parking on verges can be regulated but uncontrolled use of land adjacent to the highway can be more difficult to deal with. A clear designation of the road-hierarchy (see Table 11.1) should underpin policies on access and parking control.

Emergency Services

The emergency services must be able to respond to incidents quickly. Local authority fire services are required to arrive at fires within response times recommended by the Home Office. Similarly, NHS

ambulance services are required to respond to emergency calls within the response times in the Patients' Charter, issued by the Secretary of State for Health.

After the conceptual and objective-setting stages have been completed, fundamental conflicts may still exist between the needs and wishes of different groups, which can lead to difficult decisions at the political level. Once again, a clear designation of the road-hierarchy (see Section 11.7) can be of considerable help in this situation.

For some traffic management schemes, there is a statutory requirement to consult with the police and for others, for example, under the Highways (Road Humps) Regulations 1996 (HMG, 1996) [Nig] [Sf], the fire and ambulance services as well (see Chapter 13). However, even where no statutory requirement to consult exists, the emergency services should be kept fully informed of traffic management proposals and given the opportunity to comment.

The Department of Transport has published a Traffic Advisory Leaflet (DOT, 1994) setting out a code of practice for taking account of the needs of the emergency services in traffic-calming schemes. Although specifically concerned with traffic calming, the code is also relevant to traffic management schemes generally. The code recommends that highway authorities should establish a dialogue with the emergency services on the broad principles for introducing traffic management measures. Emergency service strategic routes should be integrated into the functional hierarchy of main



Photograph 11.11: Uncontrolled access to frontages and violation of waiting restrictions.

roads, local roads and access roads. Proposed traffic management measures should then take account of the strategic function of the route and the possible impact on emergency service response times. If appropriate, journey times should be monitored and the impact of the scheme reviewed in the light of experience.

11.11 Safety Management

About three quarters of road accident casualties occur in built-up areas. Whilst fatalities and serious injuries to vehicle occupants are less than on roads where speeds are higher, the presence of pedestrians and cyclists and the complexity of activity on the typical urban street makes it even more important to adopt a comprehensive approach to the achievement of safe conditions in urban areas for all kinds of road-user. Urban safety management provides such an approach, in which a safety management strategy is developed for each urban area (IHT, 1990). National, regional and local targets can thus be translated into specific local initiatives for each urban area and related to wider policy objectives, as discussed in Chapter 16. In particular, the establishment of a functional hierarchy of roads is combined with analysis of the accident record and perceived risks for all parts of the network, in the development of local area safety schemes. These are traffic management schemes, primarily with safety objectives, which can often, with advantage, be augmented to contribute also to improving the local environment.

Funding of local safety schemes, through the TPP/TSG/SCA system [Sa], requires a structured approach to road accident problems in an area [NIh] [Wd]. A policy of treating high-risk sites ahead of others shows progressively lower rates of return, once the worst sites have been treated, and the relevance of local area-wide safety schemes increases accordingly.

Safety management strategies also need to reflect the wider objectives of transport, health and environmental policies. For example, the need to reduce both the actual and perceived risks involved in walking and cycling may influence attitudes towards the use of cars for short journeys.

Safety management requires a highway authority to involve many other agencies, particularly those responsible for education, health and enforcement. Programmes to influence the attitudes and behaviour of road-users are at least as important as physical measures and regulation. Urban safety management strategies need to be integral parts of each authority's Road Safety Plan (LAA, 1996) [Nli] (see Chapter 16).

11.12 Environmental Management

All highway improvement and traffic management schemes should seek to make a positive contribution to the local environment. In many cases, the major aim of a traffic management scheme will be to achieve significant environmental benefits, for a specific street or area, in terms of visual appeal and the reduction of intrusion, noise and exhaust emissions (see Photograph 11.8). In others, traffic throughput, road safety or improved access may be the major objective. But, in all schemes, the aims of limiting traffic flows, on local distributor and access roads, to levels compatible with acceptable environmental standards and providing safe and attractive routes for pedestrians and cyclists, should be kept firmly in mind (DOT, 1987) [Sg].

Creation of a high quality environment is not necessarily incompatible with provision for movement. Opportunities for redevelopment exist along many major urban traffic corridors, where tree-lined streets and fine buildings can be combined, by good design, with access and movement by all modes of transport. Traffic management needs to be compatible with retention of the best from the past and the creation of new opportunities for high quality urban design. Environmental quality should be an objective in all design for traffic management and this requirement usually reinforces that of safety, especially the safety of vulnerable road-users. This subject is considered in Chapter 17.

11.13 Use of Transport Telematics in Managing the System and Informing its Users

Transport telematics (also called Intelligent Transport Systems or ITS) entails the collection, transmission and dissemination of information about traffic and its application for control and information systems and is made possible by modern technology. New aspects of traffic control, signalling, guidance and driver-information are increasingly available for general application. Sophisticated presence- and movement-detection systems provide information of increasing quality about traffic and a variety of data-transmission media are available at decreasing cost. Locational monitoring using satellites has created opportunities that would have been prohibitively expensive using terrestrial telecommunications. As discussed in Chapters 15 and 18, these developments make better roadside and in-vehicle information systems possible, together with the high levels of reliability required for

road-use pricing in urban networks. Detection of traffic flows and flexible, responsive, control of traffic movements through junctions have traditionally been favoured over predetermined fixed-time signal plans for the irregular street networks in most British cities. Advances in technology have enabled interactive control of extensive networks to be developed and priority to be assigned to chosen routes and vehicles. Locational control of congestion and selective management of traffic movements can now be achieved.

The police have radar and inductive loop devices for detection of speed-limit and red-light contraventions, used in conjunction with 35 mm and video cameras. This equipment can be linked to computer systems to process data for the issue of fixed penalties or court summonses (see Chapter 14).

For drivers, up-to-the minute roadside information can be displayed using variable message signs. The display of route and incident information and car parking space availability can make a valuable contribution to urban traffic management. The technology for in-car information systems is available and prices are falling. For bus passengers, electronic information displays, triggered by approaching vehicles, can help to encourage bus travel by reducing the uncertainty associated with waiting. Information systems are discussed in Chapter 15.

11.14 Charging for Road-Use

Regulation of traffic by price presupposes that demand for road-use is 'elastic'; ie that demand will fall as the price rises. Much economic evaluation is based on the assumption that travel-time is a commodity that can be 'traded'. This may be true only to some extent, as travel is only a means to an end not an end in itself. Car commuters, for example, may tolerate additional imposed costs, if the value to them of moving between home and work is much greater than the overall cost of travel. But, although use of a car for certain journeys may be regarded as 'essential', the times at which they are undertaken may be varied, for example, to avoid peak-hour congestion charges. This suggests that car-use, even for journeys to and from work, is not inelastic. Demand for travel for many other purposes is clearly more elastic, for instance car-use for leisure, shopping and recreational travel.

One key objective of road-use pricing is to reduce the total amounts of traffic using urban road networks at congested places and times. This will usually result in some transfer from car-use to public transport and

other modes. An adequate public transport system with capacity to respond to resulting increases in demand is thus a prerequisite but, in large cities, the likely increase may only be a modest percentage of existing patronage. Moreover, the supply-capacity (seat-km per hour) of an existing bus fleet will go up automatically if congestion in the road network is reduced.

Car parking can also be regulated by price. Differential parking charges are used to encourage long-stay parking only in the more remote car parks. An integrated charging regime for on- and off-street parking can enable off-street public car parks to be managed coherently with the demand for on-street parking. When combined with real-time information systems, such a regime can reduce the hunt for spaces and the interruption of traffic movement by the high turnover of on-street parking.

Local authorities must take care not to see on-street car parking charges, or charges for road-use, as general income. Charging under existing powers for use of on-street car parking and enforcement of regulations may produce incidental surpluses. An authority must then determine whether further provision of off-street car parking anywhere in its area is 'necessary or desirable' before surpluses are used for other transport purposes, such as public transport or road improvement (see Chapter 19).

Demand-management policies and techniques of all kinds are considered further in Chapter 21.

11.15 Public Involvement and Consultation

Regulation of use of the road system is one of the more frequent and direct contacts that people have with the local democratic system in action and most users feel competent to express an opinion, based on personal experience. Not surprisingly, public involvement has developed and been protected in law. Locally-elected representatives, who are given responsibility for making decisions affecting their electors' lives in this respect, and the officers advising them, need to take care to ensure that consultation is both thorough and structured. This helps them to appreciate and to gauge public opinion on specific issues. Hopefully, it results in better decision-taking with more consensus as to what the problems are and how best they can be tackled (see Chapter 10).

Consultation Arrangements

Direct public consultation and related correspondence both make heavy demands on staff



Photograph 11.12: A traffic management scheme chosen by local people.

resources devoted to traffic management. Public involvement needs to be organised systematically and appropriate procedures need to be identified for each project. In small towns and city districts with their own identity, regular advisory or consultative meetings with a cross-section of elected and community representatives can provide a valuable sounding-board for informed local opinion. For major studies and schemes, formal steering groups and consultative committees may be appropriate. Examples can be found in the report on Bypass Demonstration Projects (DOT, 1995).

Public meetings and exhibitions, structured to draw out clear responses, including from single-issue interest groups, are particularly helpful in exposing local concerns before detailed proposals are formulated. Later consultation can help to identify adverse effects on individual interests, before formal Orders are drawn up or land acquisition procedures are begun.

Where major transportation policy objectives are being pursued, for example through integrated transport package schemes, full public consultation at the formative stages is particularly advisable. Comprehensive traffic management can affect many people and measures need to command a broad measure of public support, if they are to be carried through successfully to implementation. Involvement of the local media is invaluable in reaching a wider public than those who attend public meetings.

Attitude surveys and Stated Preference (SP) exercises provide useful indications of the acceptability and effectiveness of proposals intended to bring about changes in travel habits and can supplement impressions gained at public meetings and exhibitions (see also Chapter 7).

For measures affecting the residential environment, such as local area safety schemes and traffic calming, local involvement in the development, and even the final design, of schemes often makes helpful and significant contributions (see Photograph 11.12). Even though demand for such local schemes remains high, acceptance of particular features in different neighbourhoods can be quite hard to assess in advance of consultation.

Statutory Requirements

The Traffic Regulation Order (TRO) procedures require formal consultation [NIj], ranging from 'posting' informative notices, ie displayed in the street or area concerned, through to full public inquiries, as discussed in Chapters 10 and 13.

Informal consultation with representatives of affected road-users should expose major objections and should provide an opportunity for constructive modifications, before embarking on the statutory procedures. Public representations to councillors, before they approve, modify or reject an Order in committee, may provide a valuable democratic safeguard.

11.16 Appraisal of Schemes to Assist Decision-Making

Implementation of agreed policies depends on the allocation of financial and staff resources. Elected members, advised by their officers, need to take decisions on the priorities between a range of competing programmes. In the case of major projects, complex appraisal techniques are required, for example, to secure financial support against competition from elsewhere (see Chapter 9). In the field of traffic and environment management, however, local decisions tend to predominate.

Local authority transport programmes typically group together measures which fulfil similar objectives. For example, accident remedial and small works programmes may be targeted almost exclusively at accident reduction and schemes can be appraised and prioritised primarily by their contribution to achieving a single policy-objective. On the other hand, a programme for works associated with private development will, of its nature, need to

be reactive to external opportunities. Major benefits could be missed, if it was not possible to 'top up' developers' contributions at the appropriate time.

Quantification of the likely cost of meeting policy-objectives, such as reducing traffic accidents, developing comprehensive cycle-networks or periodically carrying out systematic revisions of parking controls, helps to put these budgeting decisions into perspective. One of the most telling ways of assisting the process is to make clear which projects will be foregone, as financial cut-off levels are applied. This allows comparison of the value of different types of project to be made by reference to concrete examples.

Within specific programmes, councillors are more likely to rely on advice derived from technical assessment of the relative priority of similar measures. Rigorous technical appraisal should be applied, quantifying and evaluating as many factors as is practicable, using cost-benefit analysis where appropriate, including a simple first year rate of return for small schemes with similar profiles of cost and benefit over a common lifetime. Other factors need to be assessed, often subjectively, and public opinion tested. Comprehensive check-lists of the factors to be evaluated can speed the appraisal process and assist comparison (see Chapter 9).

Appraisal of the benefits and disbenefits of Traffic Regulation Orders (TROs) requires particular care, as inaccurate summaries of objections can leave the Authority's Order-making procedure open to legal challenge.

Thorough appraisal of the financial, technical and environmental effectiveness of schemes builds confidence that resources are being directed appropriately. Effects on policy objectives, other than transport ones, may need to be incorporated into the overall appraisal process, for example, the effect on disabled people, on people with impaired mobility, on those living in poverty or on the wider environment. It is necessary to demonstrate sensitivity to the interaction of transport policies with the wider needs of the community.

11.17 Implementation of Schemes

Formal processes have to be completed to implement TROs (see Chapter 13). Where physical works are involved, experimental Orders may be used. However, formal contact arrangements between the contractor or site engineer and affected occupiers is advisable. Press and radio coverage of new works and

regulations is particularly helpful in retaining the public's tolerance of temporary disruptions. Close liaison with police and the emergency services is also essential.

The need to programme alterations to statutory undertakers' plant, and to lay in new electricity supply points or telephone lines, is often the most critical element of small works. Delivery times for equipment, such as traffic signals and lighting apparatus, often exceed the tender and works period and these may need to be ordered in advance. No matter how small the project, an implementation programme should always be prepared.

The sequence of traffic flow arrangements, whilst urban traffic alterations are being introduced, can be crucial. Weekend implementation is often preferred, with extensive roadside information signs displayed on the days before a change is brought into effect. Even so, some drivers will find themselves in the wrong place at the wrong time and temporary turning areas or escape routes may need to be provided.

Works planned by local authorities and their contractors need to be recorded in advance on the Streetworks Register and, in some cases, there may be requirements to notify the Local Land Charges Register [Nik] [Sh], particularly where access rights are affected.

Finally, the effectiveness of all traffic management projects should be monitored and reviewed, to determine whether anticipated benefits have been realised in practice and whether unforeseen effects have arisen. Readiness to modify schemes (promptly, if necessary) is important in promoting public confidence in subsequent proposals (see Chapter 20).

11.18 References

- | | |
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