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Environmental Adaptation of the Main Street in Rural Towns: Towards Guidelines

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Abstract

This report establishes the principles for planning, analysis and design and formulates guidelines for the environmental adaptation of the Main Street of country towns, which should lead to a safer and more attractive environment to users of the Main Street without compromising the integrity of through traffic movements. The report explains how to look for solutions to problems as identified, outlines the principles upon which environmental adaptation is based, and documents the various measures that could be employed. A vision of what might be achieved is given with examples of integrated solutions.

Keywords

Environmental Adaptation, Traffic Management Treatments, Town Planning, Road Design.

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ENVIRONMENTAL ADAPTATION OF THE MAIN STREET IN RURAL TOWNS: TOWARDS GUIDELINES

Prepared by

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June 1992

For the

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Foreword

*There are many roads with conflicts - the need to provide for vehicle through movement, pedestrians crossing and for parking and access to frontage activities. **Environmental adaptation** is the process for adapting such roads to the needs of all of its users and visitors by using both land-use and transport measures in an integrated manner to satisfy objectives of road safety, traffic operations, amenity and cost-effectiveness.*

There are three different road environment situations: Type I road environments where the movement function is dominant and the frontages and their activities must be adapted so as to facilitate this function. Typically, this arises in the case of arterial and regional roads. In Type III road environments the movement function should be subservient to the road environment. Environmental adaptation here means the removal of through traffic, reducing vehicle speeds and volumes and facilitating safe use of roads and streets by pedestrians and cyclists. This occurs in residential and commercial precincts. Type II road environments - which is the focus of this report - are situations where both the road and frontage functions are important and an appropriate balance must be achieved. They occur along subarterial roads in major urban areas and also in the Main Street of country towns where there are often important shopping centres straddling busy roads.

In the Type II situation, the conflict amongst moving vehicles, vehicular access to frontages and business premises, on-street parking and unparking and pedestrians crossing the road are widespread. Pedestrian safety and delays are issues, as is a deteriorating environment. The general prognosis is that traffic will increase over time and the problems will get worse. There is a need for environmental adaptation in all these situations and a systematic approach is called for.

This report establishes principles for planning, analysis and design and formulates guidelines for the environmental adaptation of the Main Street of country towns, which should lead to a safer and more attractive environment to users of the Main Street without compromising the integrity of through traffic movements. The report explains how to look for solutions to problems as identified, outlines the principles upon which environmental adaptation is based, and documents the various measures that could be employed. A vision of what might be achieved is given with examples of integrated solutions. Although the report focuses on New South Wales, the guidelines are equally applicable to country towns in other States. The principles in this report are also applicable to sub-arterial road environments in metropolitan areas, but there are additional factors which need to be taken into account, such as a greater variation in flows during the day or week and the impact of any environmental adaptation on adjoining areas. A detailed treatment of metropolitan areas is beyond the scope of this report.

We hope that the report will be of interest to local government engineers and planners, elected representatives, and other interested parties, and that the visions explored will encourage detailed studies and investigations that lead to projects being gradually implemented and monitored.

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CHAPTER 1

INTRODUCTION

The centres of country towns usually straddle the main road. The Main Street of towns conjures up images of a busy traffic thoroughfare, a vehicular destination with parking and un-parking private and commercial vehicles, taxis and trucks and pedestrian activity. The problem is the fundamental conflict amongst moving vehicles, vehicular access to business premises and pedestrians crossing the street. Pedestrian safety and delays are issues, as is a deteriorating environment. The general prognosis is that traffic will increase over time and the problems will get worse.

Previous research has attempted to define and measure pedestrian/vehicle conflict in country towns and suggested some preliminary guidelines to provide a basis for assessing the nature and extent of both negative and positive associations, and for developing and evaluating options for reducing conflict and reinforcing positive associations (Black and Westerman, 1989).

However, this research did not fully explore the design details to provide visions of what could be achieved with a comprehensive approach towards the environmental adaptation of roads and their frontages, nor guidelines and selection criteria for demonstration projects. Thus, the purpose of the present research consultancy is to build on previous research and to formulate guidelines and assessment criteria for demonstration projects for the environmental

adaptation of the Main Street of country towns.

Whilst examples of innovation may be found in Australian towns, generally measures have not been introduced in a systematic way and there is still a lack of coordination amongst/in relevant measures that could be treated together.

It is important that any projects satisfy criteria for safety, transport operations and efficiency, and environmental improvement. Projects should function effectively and look visually appealing with attractive paving materials, landscaping and street furniture.

More specifically, the interrelated objectives of this research are:

- to understand the nature of the problem in a range of centres varying in size and in road characteristics;
- to develop a generalised planning, analysis and evaluation framework that explores alternative solutions;
- to set out the broad principles of environmental adaptation;
- to catalogue and illustrate specific measures - the potential "building blocks" of any project;
- to show the practical feasibility of combining measures into integrated solutions;
- to address issues of community participation in the formulation of solutions tailored for particular situations; and

- to formulate guidelines for assessment criteria.

The closest type of study to this one in Australia, as far as we are aware, is the preliminary guidelines for environmental adaptation of shopping strings along suburban sub-arterial roads (Roads and Traffic Authority, NSW, 1989; Westerman, 1990). Many of the principles, measures and processes for the suburban cases are common ones although the nature and scale of the problem may differ to that of country towns.

The methodology adopted to meet the research objectives is best described as a combination of a systematic review of previous related research on the subject matter together with the collective professional experience and judgment of the authors. Valuable contributions were also made by representatives of the funding agencies (Dominic Zaal for the Federal Office of Road Safety and Ashok Mehta from the NSW Roads and Traffic Authority, Road Safety Bureau).

This report is the collective effort of the research group. Individual contributions and expertise covered a range of disciplines - town planning, urban design, traffic and transport engineering and heritage and landscape architecture. However, the final product has benefited greatly from internal discussion, debate and comment and can generally be described as a team effort.

Furthermore, an earlier draft of this document has benefited from exposure and discussion at an invitation seminar convened in June, 1992, to discuss the findings of the research, and, more importantly, criticise, and improve, the guidelines and assessment criteria. Four workshops identified gaps, made suggestions on the assessment mechanisms, and proposed areas for further study. Participants are acknowledged at the end of this report.

Because the outcome of the research is a publication to encourage Councils to introduce integrated projects at a precinct scale, rather than to implement individual measures, it is essential that the guidelines have generality and practicality in a range of contexts. The seminar participants - mainly local government engineers and planners from country towns and officers from the NSW Roads and Traffic Authority - provided practical advice and the final contents of this report have incorporated feedback from this seminar.

The report is organised into the following chapters and appendices. The general nature of the problem is described in Chapter 2 - traffic and activity function, impact and friction, road characteristics, design and management, heritage and regional distinctiveness, and urban design. An attempt is made to categorise country towns by their traffic function, frontage land-use function, and street reservation width, although we recognise the uniqueness of each situation.

Chapter 3 outlines a general planning process that covers a series of systematic steps. This includes the principles of environmental adaptation, which

are explained in more detail in Chapter 4. There are various measures that may be employed to modify the Main Street and these are presented according to a standard format in Chapter 5.

Whilst each individual measure would be familiar to most readers and, indeed, individually, may have formed the basis for change in the Main Street, the art of designing a project is to assemble measures into integrated solutions to match the problems identified in the planning process. Some examples of this integration are illustrated in Chapter 6, where the aim is to create visions of what might be possible rather than present a detailed study of an actual Main Street and prescribe solutions.

Community acceptance and public participation are essential if proposals are to achieve their objectives and gain support and commitment. These issues and the methods for assessing the benefits and costs of alternatives as a basis for decision making are outlined in Chapter 7. The final chapter - Chapter 8 - attempts to tie everything together within a general planning and evaluation process.

The main body of the report has avoided, where possible, over referencing of the literature. An annotated bibliography, provided in Appendix A may be useful to readers seeking more technical details when conducting studies.

Appendix B provides unit cost data for some of the measures listed in Chapter 5. They are indicative only and should be checked for site specific application. However, these data have allowed an order of magnitude to be attached to the several integrated solutions presented in Chapter 6.

Although tucked away at the end of the report, Appendix C, on the criteria for assessing proposals, is an important outcome of the research and seminar discussion. It makes recommendations on three stages as to how Councils should document their case for environmentally adapted Main Streets, and, if the Government makes money available for designing and implementing model projects, the assessment criteria to use. The appendix also makes recommendations on the need to conduct before and after studies and the desirability for developing an information base that can be accessed by Councils.

The authors believe that environmental adaptation of roads and their frontages following the principles and guidelines of this report promises a safer and more attractive environment to users of the centre without compromising the integrity of through traffic movements.

We hope that the report will be of interest to local government engineers and planners, elected representatives, and other interested parties, and that the visions explored encourage detailed studies and investigations that will lead to projects being gradually implemented and monitored.

We also hope that the report will assist the Roads and Traffic Authority's strategy to manage the State's road assets in a manner which is compatible with operational, safety and environmental criteria.

Finally, we hope to have shown that the methodology has general application to country towns in other parts of Australia.

CHAPTER 2

UNDERSTANDING THE PROBLEM

Centres in country towns - the Main Street - straddle busy roads. In the past, they developed as small centres along regional routes at a time when vehicle traffic was light. Some of the centres have grown, particularly those in tourist destination areas. Traffic volumes and vehicle speeds have increased greatly and there are more trucks, buses and taxis on the road.

The result is a conflict of access and movement between moving vehicles and pedestrians using the Main Street, deterioration in the environment, a loss in character, and an unattractive centre. Pedestrian safety becomes an issue.

There are other problems. Vehicles parking and un-parking and double parked along the road reduce the capacity of the road for through movement. Parking prohibitions to increase capacity adversely affect business in the centre. Traffic noise and vehicular emissions affect

the quality of the immediate environment.

These are some of the major associations between the function of the road as a traffic route and its function as the Main Street for retail, commercial and community activity. Some associations are beneficial, such as service stations and motels serving tourists travelling on a major traffic route; others are in conflict. Different stakeholders (such as the RTA, local Council, truck drivers, business community and local community) will perceive the problems in different ways.

In this chapter, some of the problems of Main Streets will be explained. They include problems relating to traffic and to activity functions. The issues can be summarised as impact and friction, road characteristics, heritage, regional distinctiveness and urban design. A schema for classifying towns and their problems is also presented.

Introduction



In many Main Streets there is a conflict between pedestrian and vehicle needs in which the quality of the centre suffers



As traffic volumes and vehicle speeds increase, the pedestrian environment deteriorates

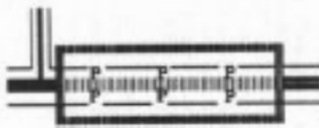
ISSUES

- Are traffic volumes and vehicle speeds high?
- Is there an excessive proportion of through traffic?
- Are there buildings of heritage value in the the Main Street?
- Is it easy for pedestrians to cross?
- Do people feel that it is safe to cross?
- Are there many jay-runners in the Main Street?
- Have there been accidents in the Main Street? What kind? And why?
- Is there a high incidence of double parking at delivery times?
- Does parking and un-parking present a problem? How often and why?
- Do people feel that the Main Street is an attractive place? If not, why not?

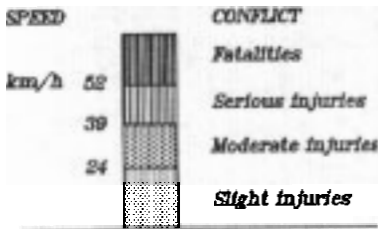
Main Variables



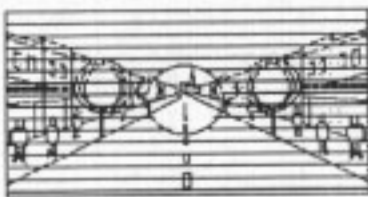
The Main Street often has a significant traffic function



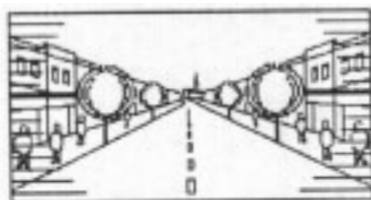
The Main Street also is an active place with a need for space



Pedestrian safety is strongly linked to vehicle speed



Field of vision at 50 km/h



Field of vision at 25 km/h

Traffic functions

There are three types of vehicle movements of significance in the Main Street of country towns: local travel within the town, regional travel with a destination in or near the Main Street, and through traffic. The local and regional traffic is the result of the service function of the town and its relationship with its hinterland. In most cases, the main highway runs through the Main Street.

The roads may have been upgraded progressively and this has accentuated the conflict in the Main Street. As traffic volumes increase, it becomes harder for pedestrians to cross the road safely. There usually are few designated pedestrian crossings. "Mid-block" crossing or jay walking are common, and can be hazardous when roads are wide, traffic speeds and volumes are high, or vision is impaired. The incidence of jay running is a sign of a mismatch between vehicle flows and speeds and pedestrian desires to cross the street.

Research shows that about 30 - 70 percent of all pedestrians visiting a Main Street centre will cross the road, and a high proportion will be jaywalking. Vehicle speed is one of the critical factors in pedestrians crossing and correctly selecting safe gaps in the traffic stream. Below 24 km/h, accidents involving pedestrians are seldom serious, but above 50 km/h, fatalities occur.

Vehicle speed affects the angle of vision of a driver. At high speeds the driver's peripheral vision is narrowly focussed, but at lower speeds the driver can take in much more of what happens in the street space and respond accordingly.

Vehicle speed also influences the stopping distance, which is determined by reaction speed and stopping distance of the vehicle. At speeds of 50 km/h, the average stopping distance is 27.2 metres; at speeds of 25 km/h the distance is 9.6 metres.

Traffic volumes determine the presence of gaps in the traffic stream for pedestrians to cross the road. The distribution of these safe crossing gaps will influence pedestrian delay. When vehicle speeds are low a higher proportion of crossers are prepared to jaywalk instead of using designated crossing facilities. Wide streets increase the exposure time of pedestrians to moving vehicles. A median allows pedestrians to cross in two stages, waiting for a gap in each of the two directions. Kerbside parking reduces exposure time to moving vehicles.

Activity function

Pedestrian movements in the Main Street are a measure of the activity of the centre. They depend on the amount, and type, of land-use activities and how they are distributed. Centres may be long ribbons extending for more than 1000 metres in large centres with different attractions e.g active retailing, post office and local hotel. In other cases, the centres may be shorter and extend more in depth, or along cross roads.

Another aspect of the activity of the Main Street as a centre is that of on-street parking. Vehicles manoeuvring into and out of a parking space or double parking delay traffic behind them, depending on traffic volumes and vehicle speed. This delay may be beneficial if traffic speeds are to be decreased, but can reduce pedestrian safety if overtaking at higher speeds in a confined space is attempted.

The frontage-related activities of pedestrian movements, on-street parking and vehicular access are not constant over time - time of day, day of the week and season. In some towns with tourist functions there may be considerable seasonal fluctuations.

Impact and friction

There is a symbiosis between the Main Street as an activity centre and the traffic along it, but there comes a point where it starts to break down. When the land-use activity in the Main Street increases, the impediments for traffic travelling through it increase. This 'friction' is caused by frequent intersections, turning movements, parking manoeuvring, delivery of goods, and crossing pedestrians (many of whom are jaywalking). If the friction becomes excessively high, traffic speeds decrease, frequent vehicle delays may be experienced and vehicle operating costs rise.

Road users also vary in their response: through traffic (especially long-distance truck drivers) is much more sensitive to friction than local traffic, and peak hour traffic is more sensitive to friction than off-peak through traffic. Conversely, if traffic volumes and speed increase, the quality of the Main Street is impaired. This 'environmental impact' manifests itself in increased pedestrian delays and accident risks, parking difficulties, excessive traffic noise, air pollution, loss of trade and an unattractive centre.

The symbiosis has different tolerance limits for different activities and road users. Some activities, especially those dependent on the passing traffic, such as service stations and take-away establishments, are

not seriously affected by increasing traffic volumes, provided convenient off-street parking is available on-site.

Establishments which are partly dependent on the passing trade, such as delicatessen, newsagents and chemists or specialised retail outlets, are sensitive to the availability of frontage parking. Here, the symbiosis breaks down when frontage parking is prohibited by time of day or removed for traffic management reasons.

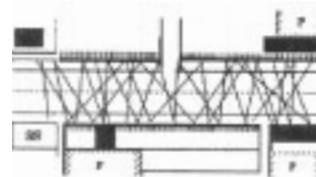
For all other activities there are limits as to how much impact they can endure. They depend on attracting pedestrians, but pedestrians are sensitive to the local environment, traffic speed, traffic noise and air pollution.

Road characteristics, design and management

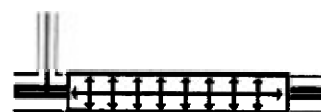
Impact and friction are also functions of the characteristics of the road space: its reservation width, carriageway width, gradient, crossfall, design and construction, location of public utilities and drainage, footpaths, parking traffic management, designated pedestrian crossings, and many other features. These features vary from place to place and give each Main Street its distinctiveness (in both a positive and negative sense).

Heritage and regional distinctiveness

The Main Street in country towns is a major element in our space heritage; it is a distinctly Australian vernacular space suited for different needs. With its linear character, unique proportions, and its verandahs (or awnings and trees), it is a successful model of a robust environment which serves as a common setting for both

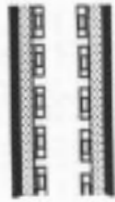


The land-use pattern determines the nature and extent of pedestrian movements through the road space



There is often scope to modify the design and management of the road space, but the road reservation is fixed and the utilities within it are costly to

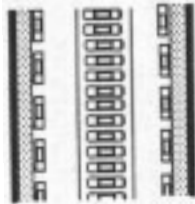
20
metres



30
metres



40
metres



The width of the road reservation has a major influence on the potential for adaptation

pedestrians and vehicles. The set of linked spaces, with active edges, strong light and shade effects and often varied roofline, provides a clear and meaningful expression of the climate, people and their lifestyle.

Many Main Streets have a particular heritage character derived from Governor Darling's regulations regarding town development published in the Sydney Gazette, May 1829. He designated that towns were to be a grid of streets aligned with the cardinal points. The streets were to be wide (36.60 metres) with 3 metre pedestrian paths on each side. Cross streets were to be 25.6 metres wide and all streets were to be planted with shade trees on the road shoulders. Although the decree applied to early NSW towns, towns in other States tended to follow suit. Towns developed by private interests and towns developed in this century are an exception.

The heritage character in the Main Street of NSW towns is also defined by architectural elements of wide verandahs and ornate parapets. Many towns have maintained this architectural character and some are protected by conservation zoning.

The heritage character is further enriched by specific local distinctiveness derived from the species of trees used in the Main Street. In coastal towns there has been a history of planting rain forest trees, such as brush box, figs, silky oaks, as well as landmark trees, such as Norfolk Island pines and Bunya pines. On the tablelands, street tree plantings were charac-

teristically pines and deciduous exotics, such as planes, elms and pin oaks. On the western slopes karrajongs, white cedars and peppers were used, while, in the far west, coral gums, peppers and tamarisk were used.

In the 1930's, a number of Main Streets had central plantings of canary island palms. In the 1950's, some towns replaced the older avenues with smaller flowering trees such as prunes and crab-apple on the tablelands and western slopes, while jacarandas were used on the north coast (NSW Department of Planning, 1990).

There is a danger that, in the name of progress - road development and building development - heritage and regional distinctiveness may be destroyed.

Urban design

Many main streets have a commercial and community centre which is concentrated in a relatively small area and contain buildings of heritage character. Beyond this core there often is a mixture of activities ranging from service establishments, and motels to isolated retail outlets with a range of urban design quality.

However, the overall character is generally unattractive and the Main Street Program of the Department of Planning is designed to improve the overall quality of the Main Street. The Program does not consider traffic and pedestrian safety. Urban design should be an integral part of any comprehensive approach to the problems in the Main Street.

Categories

Principal variables

There are many variables which make each Main Street unique, but it is necessary, for the purpose of developing guidelines, to propose a categorisation which is simple and reflects most of the combinations found in practice. A distinction between three main variables can be made:

- Traffic Function
- Activity Function
- Road Reservation Width

It is envisaged that different levels of problems will emerge and different types of solutions will evolve according to these three variables.

Traffic function

The traffic function can be described in terms of volume by composition (particularly the proportion of bulk carriers and heavy vehicles) and proportion of through vehicular traffic compared with that proportion which stops.

Traffic volumes are used as the primary indicator of the traffic function. If traffic volumes are high, and the proportion of through traffic or heavy vehicles is high, then there is a *prima facie* case for a by-pass, which falls outside the scope of this research.

If traffic volumes in the Main Street exceed 8000 vehicles per day, one traffic lane in each direction may not suffice, and a set of circumstances exists, requiring different types of environmental adaptation. A traffic engineering study is likely to be needed and adaptation may be difficult to achieve with low-cost measures.

If traffic volumes are less than 3000 vehicles per day, low-cost solutions may be practicable.

Many smaller country towns come into this category. For these, and for other reasons, the traffic function has three categories: more than 8000 vpd, 8000 - 3000 vpd, and less than 3000 vpd.

Activity function

The activity in the Main Street depends on its attraction as a centre. It varies during the day, the week and can vary during the year, especially if the town or the region are tourist destinations. This activity can be concentrated or dispersed, but for reasons of simplicity, the length of the active Main Street frontage is used. Active frontage is defined as that frontage with a preponderance of pedestrian-oriented and concentrated activities.

In many country towns with a population of less than 5000, the active frontage is less than 400 metres. Thus the Main Street activity function is divided into two categories: 'long' - more than 400 metres, and 'short' - 400 metres or less.

Road Reservation Width

The critical variable here is the width of the road reservation. Typical widths are 20, 30 and 40 metres (1, 1.5 and 2 chains). The majority of country towns in NSW have Main Streets between 20 and 40 metres width. As the road reservation is very significant in developing options for environmental adaptation four categories: 20 metres or less, 21 - 39 metres, 40 metres or more - are defined.

Schema

The categorisation schema is shown in Table 2-1. Certain combinations can be excluded: a low traffic function (under 3000 vpd) and a long frontage function (over 400 metres) is rare.

Table 2-1 Categorisation of Main Streets

TRAFFIC FUNCTION	FRONTAGE FUNCTION	WIDTH OF RESERVATION (metres)		
		20 or less	21 - 39	40 - or more
Major >8000 vpd	Long >400 m			
	Short <400 m			
Moderate 8000-3000 vpd	Long >400 m			
	Short <400 m			
Light <3000 vpd	Long >400 m			
	Short <400 m			

Excluded

Moruya

Bega

Ulladulla

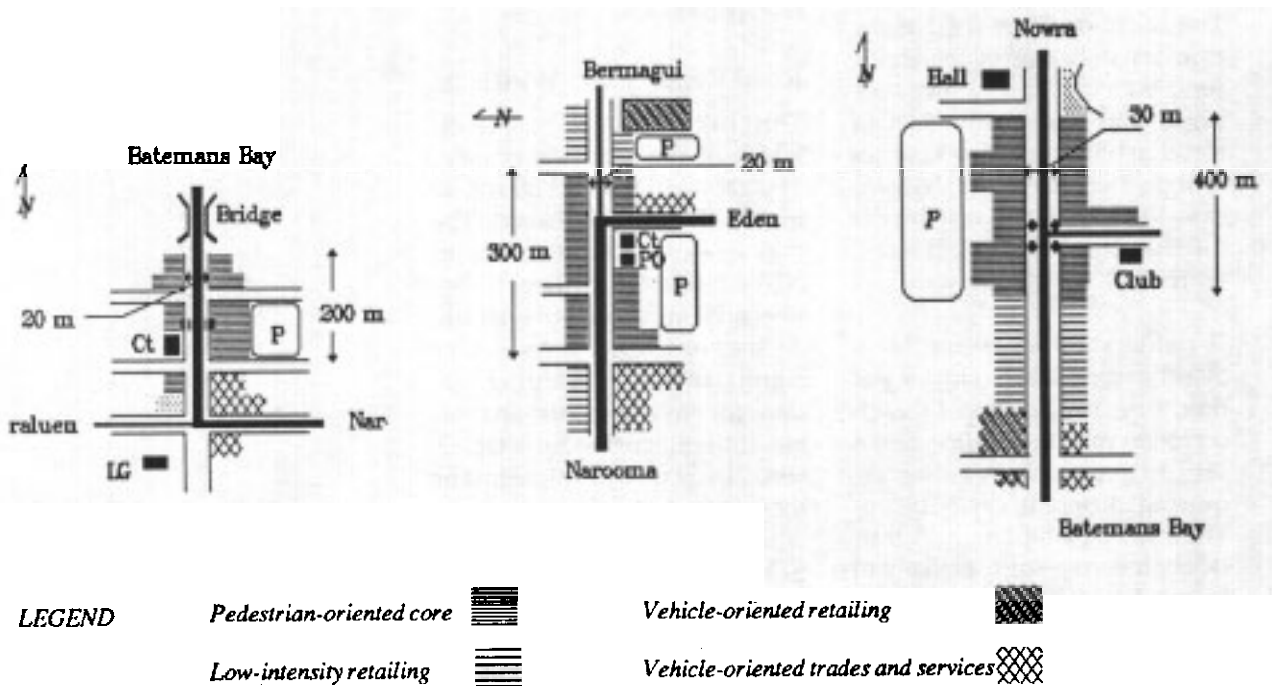


Figure 2-1 Illustration of Categorisation of Main Streets

CHAPTER 3

LOOKING FOR SOLUTIONS

This chapter sets out how to look for solutions to the problems identified in Chapter 2. It proposes that a systematic approach be followed, including clarifying objectives and deciding on the study area, time scale and information needs to be considered. It lists principles

(to be explained in more detail in Chapter 4) and how these principles can be applied by using a range of measures (described later in Chapter 5). The chapter concludes with the need to develop options, assess them and evaluate them with community participation.

Introduction

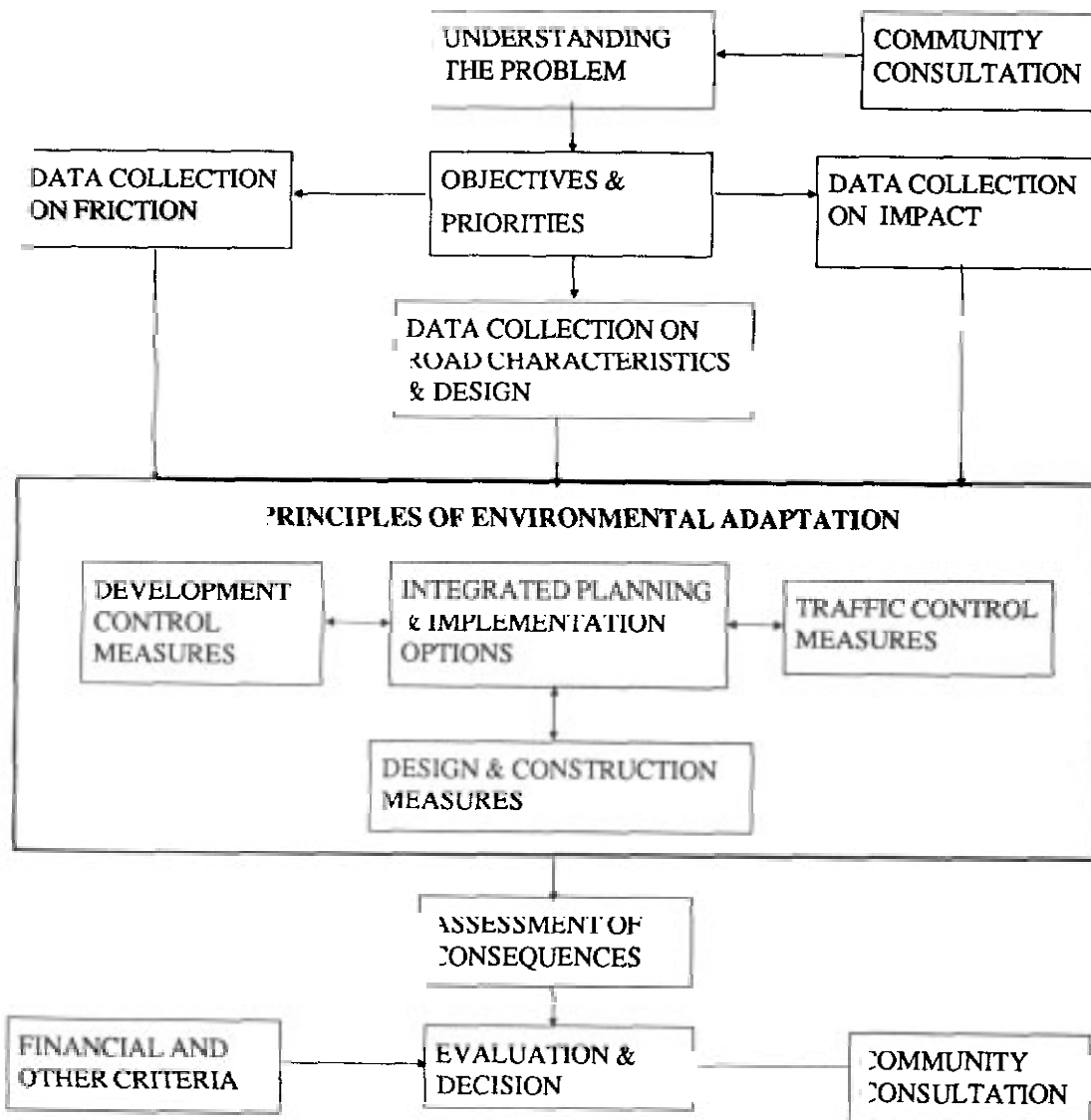
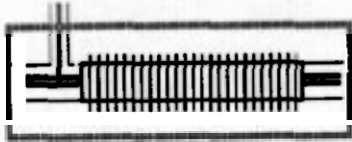


Figure 3-1 General Planning Process

Systematic approach



There may be a need to consider a larger area than the Main Street alone

Solutions to the problems identified in Chapter 2 may have consequences which should be addressed through a range of measures. For this reason, there is a need to prepare an integrated plan and program which starts with setting objectives and priorities - and redefining them where necessary - seeking information, developing alternatives and assessing the likely impact.

Environmental adaptation of the Main Street, therefore, requires a process of investigation and problem solving. The process is shown in Figure 3-1.

Objectives and time scale

Fundamental actions, such as external by-passes, or a major shift in the centre of activity of the Main Street, may well be necessary where there are severe conflicts. However, they usually require a long-term time frame and are expensive. For these reasons they are not suitable for projects of environ-

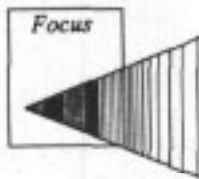
sidered in the shorter term, but could create a new problem elsewhere. The areas where the routes are relocated will be exposed to traffic noise and new safety problems for crossing pedestrians may arise.

The most practical option in many cases is to modify the road space and the traffic management and planning controls. This is what this report calls 'environmental adaptation', which can be defined as the process of adapting the Main Street to the needs of all its users and visitors in a manner which satisfies objectives of road safety, traffic operations, amenity and cost-effectiveness.

What study area?

There is always a risk that the introduction of a particular isolated measure to solve a specific problem leads to new problems elsewhere. This can occur, for instance, when on-street parking is changed from angle parking to parallel parking. The

'understanding of the relationship between traffic and road environment is fundamental'



Present → Future

The opportunities for change increase with time and access to funds. The focus of the guidelines is on shorter-term and achievable targets

mental adaptation which are expected to be capable of implementation in a reasonably short-term time frame and more modest expenditure.

Pedestrian malls may be feasible where through traffic does not exist or can be diverted. Malls need not be extensive and may be confined to the core of the centre. Malls can be expensive because of reconstruction work to underground services. An appropriate time to consider this option is when major reconstruction is necessary in any event.

Internal by-passes designated by advisory signs may be con-

change may have been made to reduce vehicle emissions close to the footpath, facilitate the movement of vehicles and reduce the potential for accidents between vehicles. However, if the carriageway width is not changed, vehicle speed may increase, pedestrians have to cross a wider carriageway and pedestrian safety is decreased.

There are also spillover effects. Reducing vehicle speed through a variety of measures may increase pedestrian safety in the Main Street, but lead to the use of the backstreets for local or through traffic. It is necessary, therefore, to consider such effects and take appropriate

measures as part of the comprehensive approach to the Main Street problems.

Inventory

An inventory of the Main Street (and in some cases its immediate environment) is necessary in order to understand the problems and help establish specific objectives. Many problems of friction and impact will be self-evident, but there are others which may not be so obvious. Attitudes of visitors can be obtained by street interviews. Business and community participation at this stage is also very useful to understand local problems and formulate objectives.

Information needs

Depending on the nature of the problem, the objectives to be achieved and funds available, information may be required on any or all of the following aspects:

- land use, site conditions, characteristics of the road space;
- traffic volumes, the proportion of through traffic and heavy vehicles;
- vehicle speed, pedestrian crossing (both legal and jay walking), pedestrian flow on the footpath; accidents;
- road geometry;
- the management of the road space: crossings, parking, taxi stands, bus stops; and
- business activity and the dependence on passing traffic.

Principles of environmental adaptation

There are a number of principles of environmental adaptation which should be applied in the development of comprehensive options. They can be summarised as follows.

- reduction of severity and extent of conflict between pedestrians and vehicles;
- introduction of a speed profile;
- the speed profile to be achieved through design speed;
- design speed to be based on managed friction;
- entry portals to be introduced;
- introduction of an activity profile;
- identification of a core zone;
- identification of a transition zone;
- frontage activities to be related to the type of zone;
- development control to reflect the type of frontage activities in each zone;
- on-street parking to be provided so that it supports the above principles;
- road space management to respond to changes in pedestrian and vehicular demand;
- footpaths to be designed for a range of uses;
- streetscape design to reflect different friction/impact conditions of sections of the Main Street; and
- street trees to reinforce the environmental adaptation and desired character of the Main Street.

These principles are discussed in greater detail in the next chapter. The need to understand the relationship between traffic and the road environment is fundamental to the concept of environmental adaptation. This affects the process for developing solutions and the combination of measures used for implementation.

Measures

A range of measures, described in Chapter 5, is available to achieve the principles set out in the previous section. There are



The often varied skyline gives the Main Street its distinction

two type of measures: control and design/construction measures.

Control measures can be related to the control of traffic, such as a parking prohibition. They can also be related to the control of frontage development, such as vehicle access or building set backs.

Design and construction measures are mainly related to the road space. For instance, the introduction of road narrowings, pavement changes to identify pedestrian crossing locations, and landscape improvements are design and construction measures.

Some control, design and construction measures can be considered only in the long term, while others are appropriate at any time.

Application of measures

Measures can be applied for a range of purposes. A roundabout, for instance, is a useful device for controlling traffic movements at an intersection, but also slows vehicles down and is safer for vehicles than an uncontrolled four-way intersection. A tree canopy is attractive but also heightens driver attention. A median allows pedestrians to cross in two stages; an arcade can concentrate pedestrian movements. Options should use a different combination of measures.

Each situation is unique

Each Main Street has its own specific qualities and the scope for application of the measures will vary considerably, depending on local conditions. There are many situations, but the categorisation in Chapter 2 built on traffic function, activity function and road reservation width may provide a basis for considering measures.

Assessment and Evaluation

Assessment

The formulation of options is an important step in the process, but options are of limited value if it is not possible to cost them and predict their likely consequences. An assessment should also be made of the likely costs and benefits and the feasibility of a staged implementation program (Chapter 7).

Consultation

Community consultation at the beginning of the process helps in understanding the issues and makes the community aware that a study is in progress.

Consultation towards the end of the process is important for making judgements. After assessing the consequences from a particular set of options, there is a need to evaluate them for their

impact on different sections of the community and indifferent types of road user ('incident analysis').

There are technical and non-technical considerations here. Technical considerations involve matters such as the nature and severity of accidents, vehicle collisions, noise levels, crossing ability, and delays to vehicles in traversing the centre. However, the ability and willingness to accept the consequences, including the costs involved, is not a technical activity. For this reason it is important that the community and the businesses in the Main Street are consulted in the exploration of options and the determination of priorities and preferences (see Chapter 7).

CHAPTER 4

PRINCIPLES

A number of principles of environmental adaptation have been listed in Chapter 3 and this chapter explains what they are in more detail. It must be stressed that none of the prin-

ciples should be applied in isolation. There are many examples where the application of one principle has led to unsatisfactory conditions and subsequent abandonment of the plan.

Introduction

Shared road space to reduce severity and extent of conflict

Vehicles and pedestrians can share the road space, but only under controlled and properly managed conditions. Vehicle speed must be low, so that the severity of any potential conflict is minimised, and the activities which attract pedestrians should be concentrated so that the spatial extent of the potential conflict is minimised. This leads to the two basic principles in a shared situation: the need for an appropriate speed profile; and the need for an appropriate activity profile.

Establish a speed profile

A speed profile of existing traffic shows what happens when traffic proceeds through a centre. The aim is to ensure that vehicle speed is not greater than 25 km/h in the area where a significant amount of pedestrian activity occurs.

Drivers approach the centre at speeds which are normally much higher. The desired speed profile indicates the speed variation required from the approaches to the centre to the speed which is acceptable in the core of the centre.

Speed profile to be achieved through design speed

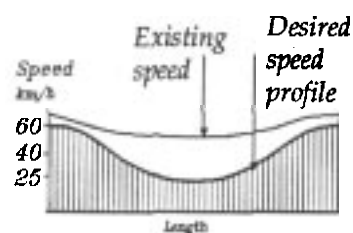
Drivers are more influenced in their behaviour by the conditions of the road than by legal speed limits, unless they fear they may be caught. Pedestrians, when crossing a road, tend to assume that drivers will observe the road rules and speed limits.

A potential conflict situation is set up when speed controls are introduced on road sections which are designed for higher speeds. Accidents may be caused by abrupt changes in design speed and in speed controls. For this reason, the speed profile should be achieved through measures designed to elicit a gradual change in driver behaviour, and not through legal speed limits alone.

Design speed based on managed friction

The desired speed in any particular section can be achieved by a variety of measures. Regulatory control has been the common practice, but is less effective than measures which rely on increasing driver attention to the road environment.

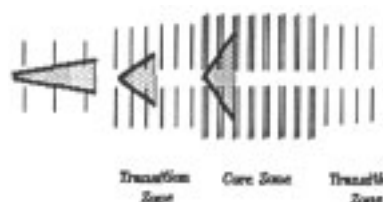
Principles



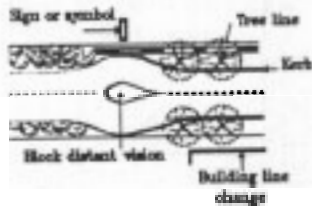
Establishing a speed profile is a key principle of environmental adaptation



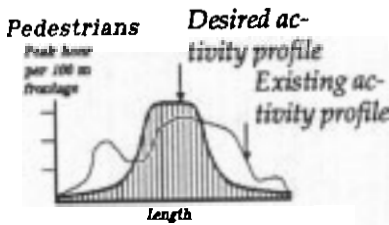
Road and road environment should be designed and managed to elicit appropriate driver behaviour



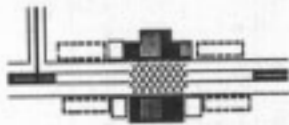
Driver attention is enhanced through changes in the streetscape design and stimuli in the area of peripheral vision



Entry portals should be used to prepare the driver for changed conditions



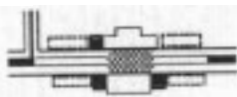
Establishing a concentrated activity profile is another key principle



Pedestrian-generating activities should be confined to the core



Vehicle-generating uses should be located in the transition zone



Activities which generate both pedestrians and vehicles should be located in the transition zone adjacent to the core zone

Driver attention can be enhanced through changes in the design of the road, physical constraints such as roundabouts, and visual features, such as trees and road-side advertising. On-street parking manoeuvring can also be an effective tool for changes in driver behaviour. As the number of stimuli in the area of peripheral vision are increased, drivers respond by slowing down. The speed design profile should be achieved through a combination of such friction-producing measures.

Entry portals

Driver awareness of changes in the road environment, requiring a different driver behaviour, can be reinforced by the introduction of special features - a 'portal' - marking the beginning of an area where a speed profile applies.

As changes in the speed profile should not be sudden, there may be advantages in introducing two portals where there are great differences in the design speed on the open road and the design speed in the Main Street. The outer portal conditions the driver to a speed reduction in the transition zone, while an inner portal forces the driver to reduce speed to the level required in the central zone and to slow right down when required.

Establish an activity profile

The main causes of friction associated with the road environment in Main Street centres are double parking, parking manoeuvres and crossing pedestrians. They are directly related to the extent and level of activity along the frontage.

In order to minimise the extent of such friction for the motorist, an activity profile must be established. This consists of a high

activity core zone where pedestrian-generating activities should be concentrated, and a low activity zone where vehicle-oriented activities should be sited. At the interface between these zones, there is room for some activities which have both characteristics, such as large supermarkets.

Define core zone

The core zone should be as short in length as possible. This achieves two objectives: it confines the potential conflict area and provides a pedestrian focus for the Main Street. The distinguishing features of the town can be highlighted by appropriate landscaping and urban design.

Expansion of pedestrian-generating activities should be encouraged in a lateral direction, through arcades, for instance, and rear off-street parking should be provided, away from the road frontage.

Define transition zone

The transition zone is defined by the outer and inner portals. There are many commercial activities which are located at the edge of a Main Street centre, because they can not operate on sites with high property values, yet benefit from a close association with the centre. These, typically, are drive-in establishments, service stations, hardware stores, motels and similar establishments. They do not generate many pedestrians, but require vehicle access.

Pedestrian-generating activities should not be located here as vehicle speeds are higher and friction should be contained. Sites should have on-site parking, and movement should be drive in/drive out.

Activities generating pedestrians and drive-in vehicles

Activities which generate both pedestrians and drive-in vehicles should be located in-between the vehicle- and pedestrian-oriented zones. For instance, supermarkets come into this category.

Development control

It may be difficult to achieve a concentrated activity zone in existing centres where pedestrian activities often extend over considerable length and are interspersed with vehicle-oriented uses. Development control plans, incorporating the principles, should be prepared, so that any new development can be made to conform with them.

Provision of on-street parking

Some on-street parking and bus stops should be provided in most conflict zones. It is important for traders and it provides opportunities for handicapped people, taxis, and fast pick up and deliveries. It also provides a barrier between pedestrians on the footpath and moving vehicles, reduces pedestrian exposure, reduces the impact of noise emission, and acts as a speed control device.

Parking often detracts from the quality of the centre and the size and design of on-street parking areas deserves careful attention. The relative merits of angle and parallel parking will be discussed in Chapter 5.

Landscaping and other measures can be used to reduce its visual impact.

Dynamic road space management

In some situations, traffic volumes and composition vary

considerably. Through traffic may be heavy at certain periods while most of the traffic during the remainder of the day is of a local nature. There also may be seasonal fluctuations in towns with a strong tourist function. This fluctuation in traffic function influences the choice of measures and their application. Some measures, especially those related to on-street parking, can be applied at different times of the day.

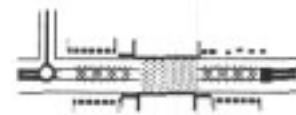
Footpath width and utilisation

Adequate footpath width is essential, as the quality of the Main Street is dependent on it. There should be opportunities for walking, talking and shop window gazing. There should also be opportunities for street furniture and weather protection. Where the width is sufficient, pavement cafés can be considered. Bonuses could be given for setbacks and lateral redevelopment, but continuity in weather protection and footpath character should be provided.

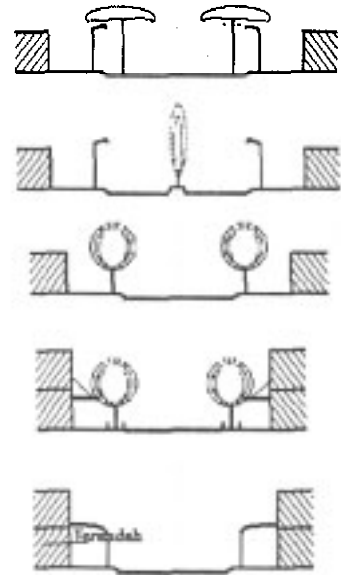
Streetscape design

The streetscape should not only reinforce the quality of the Main Street as an attractive centre, but also reflect the desired activity and speed profile so that the driver becomes aware of the changing nature of the frontage development. It is important that the physical character of the selected measures (see Chapter 5) and their design details are compatible with, and reinforce, the particular quality and heritage of the streetscape.

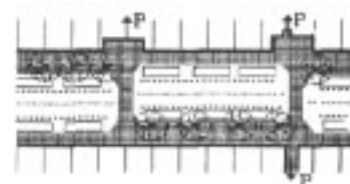
Considering the desired level of complexity (number of elements) of the built environment, pedestrian-oriented and car-oriented environments are incompatible. Since speed has been identified as the key ele-



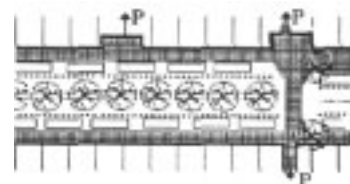
Driver attention is enhanced through changes in the streetscape design and stimuli in the area of peripheral vision



Streetscape design should reflect different friction/impact conditions of sections of the Main Street



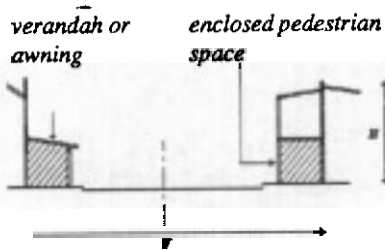
There are many ways in which the road space can be re-designed. In the above example, the axis of the carriageway is changed and the footpath widened



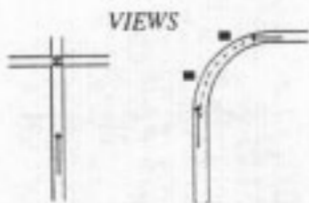
A less costly option may be to plant trees in the median but this requires the right kind of tree and other measures

ment in the management of pedestrian/vehicular conflict in shared road space environments, which should be reduced in core zones, streetscape improvements in such zones should be done primarily with pedestrians in mind.

A different streetscape should be developed for: (a) the road/environment outside the centre, (b) the transition zone, and (c) the core zone. Views (including natural features, heritage facades, vertical elements) deserve particular attention in Main Streets. Curving or turning road space alignment



Because of the often low ratio of height (H) to width (W), it is important to provide enclosed secondary spaces for pedestrians



Long, unrewarding vistas should be interrupted
Local landmarks in strategic positions should be reinforced

can be a particular asset if some rewarding views are provided. Strategic positions can be identified and local landmarks reinforced accordingly. Long straight dull vistas should be terminated to break up the uninterrupted viewing distance of drivers according to the desired speed profile.

Environmental issues

The experience of the Main Street by both drivers and pedestrians is subject to a number of broader environmental impacts, namely the heat and glare of the sun in summer and the presence of dust and fumes generated by cars, prevailing winds and turbulence produced by buildings. Hard impermeable surfaces contribute to the environmental problems of polluted water run-off.

The use of street trees in the Main Street can ameliorate heat and glare and air pollutants, and can intercept rainfall, thus reducing the velocity of storm water. Trees planted in porous material, reduce the problems of polluted water run-off.

Trees

If trees are to be used to achieve the benefits of environmental adaptation, the following principles should be observed.

Space availability

Where trees are recommended to supply shade and define the width of the carriageway, a tree with a clear full trunk and spreading canopy is needed. Such trees require space. Small trees are not recommended as they do not provide shade and reduce visibility.

If trees are located on footpaths, they need to be free of overhead awnings and need a ground surface area for the penetration of

air, water and nutrients. Tree grates and guards are necessary.

If trees are located on road shoulders, it is preferable to plant them in a porous material such as gravel or no-fines concrete. They require robust tree guards to protect them from vehicles.

Trees planted on median strips require adequate soil preparation and an adequate area in which to grow. The species selection is important as branching can be in conflict with passing traffic.

Availability of tree management

Because trees are living organisms, their maintenance and management must be allowed for before planting them in Main Streets which, in general, do not provide ideal growing condition. The heritage of existing large avenue trees is derived from a time when trees were established in unsealed road shoulders. Today, Main Streets are sealed and subject to high traffic pressure and special planting and maintenance procedures are required. These include generous soil preparation, slow-release fertilisers, guying and staking, insect control and careful tree surgery.

Conflict with overhead powerlines

The allocation of the same area in the street space to street trees and overhead services has resulted in severe mutilation to street trees. Small trees are inappropriate in Main Streets due to visibility and space availability issues. It is therefore essential that aerial bundle conductors replace existing overhead powerlines or that underground services are installed. Aerial bundle conductors are a relatively low-cost option and have been used effectively in Sydney and in the Blue Mountains.

CHAPTER 5

MEASURES

Understanding the problem of a particular Main Street environment and the underlying principles involved in finding solutions, the next step is to develop a vocabulary of 'building blocks' from which a selection can be made for developing integrated solutions.

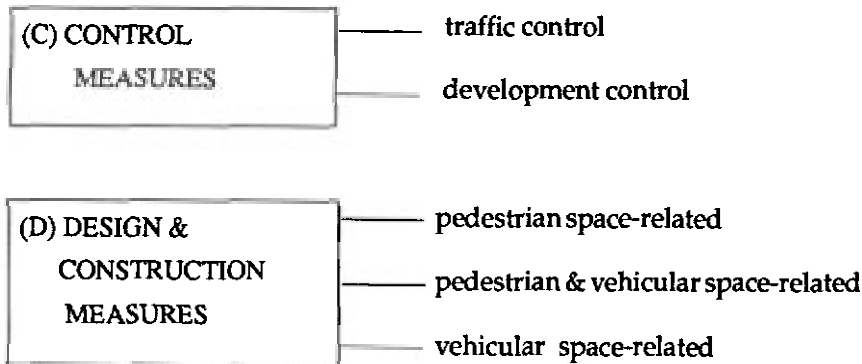
These building blocks are called 'measures' in these guidelines and are divided into two major groups: control measures and design and construction measures. Each of these groups could be subdivided further according to whether a control measure relates to traffic or development control, or whether a design/construction measure relates to the road space or to the vehicle space.

comprehensive inventory and to provide ideas for more extensive designs.

One single measure can seldom provide a solution for a problem situation; measures should rather be applied in combination in a complementary manner. Furthermore, many of the measures serve more than one purpose. There are no hard rules governing the application of individual measures or a combination of them. Their effects may vary due to differences in site conditions, and the magnitude and nature of the conflict.

In the 46 measures that follow a brief commentary is provided for each measure to highlight its

Introduction



The measures vary a great deal in nature, cost and time frame required for implementation. Although the intention was to focus largely on relatively cheap and simple short-term solutions which can be taken up by the majority of small local communities, some more expensive and longer-term measures have also been included to develop a

specific aims, characteristics/ applicability, limitations and expected impacts. Indicative cost figures are provided in Appendix B.

CONTROL MEASURES

DESIGN AND CONSTRUCTION MEASURES

TRAFFIC CONTROL

- C1 Channelisation
- C2 Cross pavement markings
- C3 Speed zoning
- C4 Management of on-street parking
- C5 Management of on-street loading
- C6 Light traffic thoroughfare
- C7 One-way road system
- C8 Traffic signals
- C9 Pedestrian crossings
- C10 Bicycle way
- C11 Bicycle storage

DEVELOPMENT CONTROL

- C12 Detailed zoning
- C13 Frontage width control
- C14 Floor space ratio control
- C15 Control of business hours
- C16 Off-street vehicular access/parking
- C17 Infill/redevelopment
- C18 Footpath utilisation
- C19 Advertisement control
- C20 Streetscape
- C21 Views and vistas
- C22 Heritage conservation

VEHICULAR SPACE RELATED

- D1 Off-line bays
- D2 Different carriageway pavement
- D3 Raised pavement
- D4 Bypass roads (including LATM in the Main Street)
- D5 Staggered roadway
- D6 Roundabouts
- D7 T Junction rearrangement
- D8 Staggered junctions
- D9 Raised pavement within intersection
- D10 Two lane entry threshold
- D11 Gateway
- D12 Tree planting in median strip
- D13 Tree planting in road shoulder

PEDESTRIAN & VEHICULAR SPACE RELATED

- D14 Shared space
- D15 Road closure - Main Street
- D16 Side street closure
- D17 Shared/raised pedestrian crossing
- D18 Street lighting
- D19 Carriageway/lane narrowing
- D20 Railing of footpath/median
- D21 Grade separated pedestrian crossing

PEDESTRIAN SPACE RELATED

- D22 Footpath design (including extension)
- D23 Awning/verandah
- D24 Tree planting in footpath

C1

CHANNELISATION

AIM

- Separate conflicting traffic movements
- Direct traffic to specific lanes
- Reduce or prevent turning movements
- Separate pedestrians/vehicular traffic
- To provide advance warning for drivers, approaching other treatments.

APPLICATION

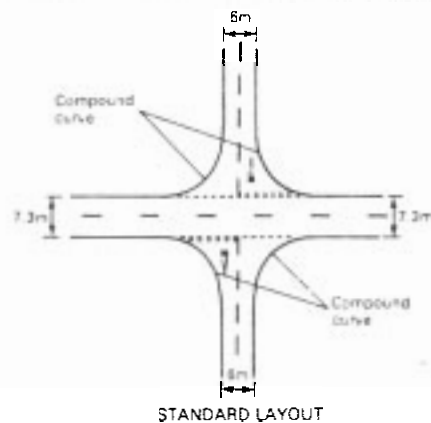
- Where protection is required for pedestrian crossings
- Where traffic control is required because of accident history or traffic congestion
- Can be used in most situations in by means of concrete or landscaped traffic islands, wide painted medians and ripple paint (vibraline), and safety bars/rumble bars
- Painted medians and rumble bars can be low cost treatments.

LIMITATIONS

- Concrete islands require sufficient space to maintain road lane widths
- Painted medians may not be suitable for high vehicle/pedestrian activity situations as the markings will be difficult to see or be disregarded.

IMPACT

- Reduces need for driver decision
- Can reduce space for on-street parking
- Can increase street drainage requirements
- Can be unattractive unless wide enough for landscaping (1m)
- Provides mid road refuge for pedestrians
- Provides storage space for turning vehicles
- Will increase costs of cleaning and maintaining the road
- Rumble bars can be a hazard if dislodged and can be a hazard for pedestrians and cyclists
- Can be used to prevent overtaking and to increase friction through parking vehicles
- Increased lane discipline.



RUMBLE AREA

13 mm



NB. Vertical scale slightly exaggerated on these drawings

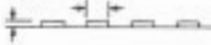
RUMBLE STRIPS

13 mm

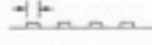


JIGGLE BARS

13 mm



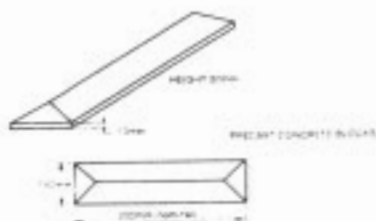
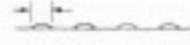
36 mm



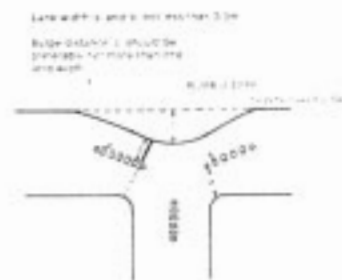
51 mm



152 mm



RUMBLE BAR (Suggested Design)



RUMBLE BARS AT T-INTERSECTION

C2

CROSS PAVEMENT MARKINGS

AIM

- To gradually reduce speed

APPLICATION

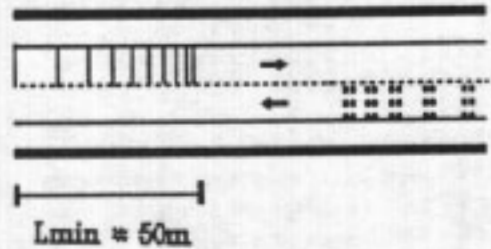
- In the transition zones of the centre parallel strips across the traffic lane(s) at diminishing intervals; either painted or made of rough textured material (e.g. cobble stone).

LIMITATIONS

- Regular maintenance of painted marks
- Rough texture may increase noise level.

IMPACT

- Small decrease in speed due to drivers' perception of relative acceleration.



C3

SPEED ZONING

AIM

- To reduce vehicle speed along Main Street
- To assist pedestrian movement across the Main Street.

APPLICATION

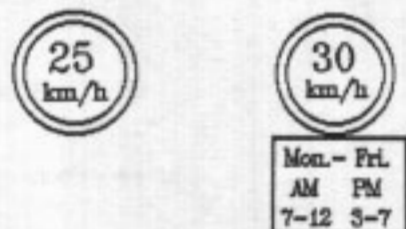
- Where the budget is very limited.

LIMITATIONS

- Needs to be constantly enforced
- Usually only effective in conjunction with other measures.

IMPACT

- Can give pedestrians a false sense of security by expecting drivers to obey signs.



C4

MANAGEMENT OF ON-STREET PARKING

AIM

- To control the quantity of on-street parking in the Main Street
- To reduce problems of vehicle fumes directed to pedestrian areas
- To regulate the turnover of parking in the Main Street.

APPLICATION

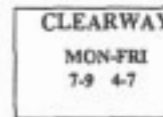
- Used to distribute parking to the appropriate parts of the Main Street
- Can be used as part of the landscape treatment of the Main Street
- Can be used to reduce/increase friction with through traffic.

LIMITATIONS

- Angle parking can increase vehicle fumes in pedestrian areas
- Angle parking requires substantial pavement width
- Parking manoeuvres can be in conflict with through traffic and pedestrian movements
- Period parking requires enforcement.

IMPACT

- Employees and shop owners will be forced to park elsewhere
- A reduction of parking close to shops will be opposed by shop owners
- Large areas of paving required.



C5

MANAGEMENT OF ON STREET LOADING

AIM

- To reduce the use of the Main Street by delivery vehicles
- To provide special space on Main Street for delivery vehicles.

APPLICATION

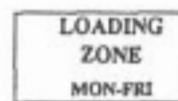
- Where alternate loading/delivery facilities are available
- Where peak traffic demands extra road capacity.

LIMITATIONS

- Requires enforcement
- Rear or side access may be required to properties fronting the Main Street
- Adequate advance warning signs are required
- Increase travel distance for delivery vehicles.

IMPACT

- Can be confusing for drivers of delivery vehicles
- Often ignored by drivers of food delivery vehicles
- Provides additional space for on street parking where delivery vehicles are prohibited
- Reduces on street parking when special delivery zones are provided
- Special delivery zones can be an inefficient use of road space if not managed flexibly over time.



C6

LIGHT TRAFFIC THOROUGHFARE

AIM

- Control of heavy vehicles on Main Street.

APPLICATION

- Where bypass is available
- Rear access available for delivery vehicles
- Initial low cost solution, but enforcement costs are ongoing.

LIMITATIONS

- Difficult to enforce
- Increased journey time for delivery vehicles.

IMPACT

- Confusing and/or inconvenient for non-locals
- Reduced road pavement loading
- Improved pedestrian and vehicular safety
- Reduced noise, fuel emission and vibration.



C7

ONE-WAY ROAD SYSTEM

AIM

- To create a partial mall within the Town Centre, enhance the Town Centre and/or provide additional on-street parking and safer conditions.

APPLICATION

- Where there is insufficient road width for two-way movements
- Where there is an alternate route for the displaced traffic movement.

LIMITATIONS

- Bus routes which may not be altered.

IMPACT

- Can mean increased vehicle trip length
- Possible loss of business
- Air pollution, noise reduced
- More effective landscaping can be achieved, especially where lane numbers and road widths vary
- Pedestrian crossing is easier
- Improved traffic flow
- Increased parking availability by the conversion of kerb parking from parallel to angled parking
- The number of conflict points are reduced at intersections
- Traffic signal co-ordination optimised
- Parking manoeuvres are less dangerous and cause less disruption
- Bus routes may require re-routing
- Increased vehicle speeds
- Possible confusion for emergency and delivery vehicles.



C8

TRAFFIC SIGNALS

AIM

- To control traffic speeds
- To improve safety for motorists and pedestrians crossing Main Street
- To control turning vehicles at intersections.

APPLICATION

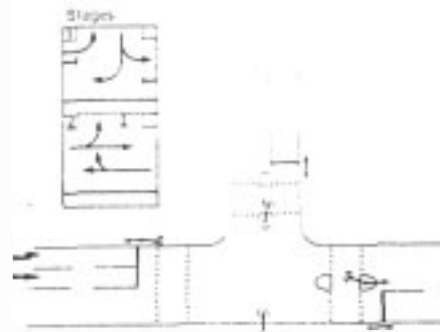
- Mid-block and intersections.

LIMITATIONS

- High cost
- Not suitable at poor sight distance locations without complementary measures
- Specialist maintenance and servicing required
- High pedestrian and vehicular volumes needed to justify the expenditure.

IMPACT

- Control of traffic speed
- Increased noise, fuel emission
- Possible increase in accidents if sight distance is inadequate
- Can provide flexible control of vehicular and pedestrian flows
- Could be out of character with the Town's streetscape
- Can arrange traffic into plateaux which create gaps for pedestrians to cross the road.



C9

PEDESTRIAN CROSSINGS

AIM

- To improve pedestrian safety
- To control speed of through traffic
- To promote business activity on both sides of Main Street.

APPLICATION

- At-pedestrian-desire lines
- Controlled intersections
- Mid-block
- With or without traffic light.

LIMITATIONS

- Vehicle approach speeds should be kept low
- May not be appropriate near large roundabouts
- Require adequate sight distance and pedestrian visibility
- Restrict traffic flow on Main Street.

IMPACT

- Reduced travel speeds
- Improved pedestrian safety
- Increased opportunity for pedestrians to cross
- Restricted vehicular access to properties
- Reduced potential for jay-walking.



C10

BICYCLE WAY

AIM

- To improve road safety
- To promote bicycle use
- To decrease pollution

APPLICATION

In active centres where bicycle use has some tradition, popularity or potential, provision for cycling is incorporated into the Main Street environment including:

- 1) segregated bike lane (as part of the carriageway)
- 2) without segregation in mixed traffic with low vehicle speeds; or
- 3) on shared footpaths.

LIMITATIONS

- On-street parallel parking/delivery may create hazard for cyclists
- Road pavement must be in perfect condition
- Drainage pits may need readjustment
- Climate can be an interfering factor in bicycle use.

IMPACT

- Possible increase in bicycle use and consequent decrease in local vehicular traffic
- Increased catchment of the Main Street for people without access to private car.



C11

BICYCLE STORAGE

AIM

- To improve the convenience of cycling
- To promote cycling

APPLICATION

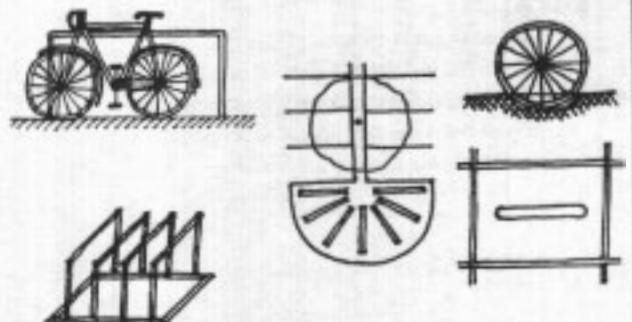
- Near the entrance of major generators and at other selected convenient points, simple but attractive storage facilities are provided primarily for short-term visitors (slots in the pavement, racks, railing, etc.)

LIMITATIONS

- Only locations with permanent public surveillance are suitable
- Protection against weather is desirable.

IMPACT

- Increased bicycle use by local shoppers
- More effective footpath utilisation.



C12

DETAILED ZONING

AIM

- To establish appropriate activity profile for the centre, with grouping compatible uses.

APPLICATION

- In long centres which dynamically develop, or where businesses change over time
- A high activity core is zoned for predominantly pedestrian oriented uses and low activity transition zones are created on either side of the centre, predominantly for vehicle oriented uses. Uses which rely on both can be situated near the edges of the two different zones.

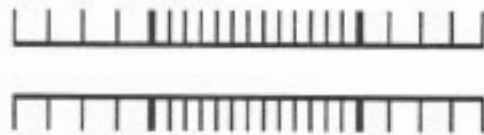
LIMITATIONS

- It may be difficult to establish an activity profile in existing centres where pedestrian oriented uses are dispersed with vehicle oriented uses
- Slow process which requires long term commitment.

IMPACT

- More compact and therefore convenient pedestrian core
- The potential conflict area is confined
- This confinement creates opportunity for speed zoning (e.g. 25 km/h core zone and 40 km/h transition zones).

Pedestrian-oriented land uses Vehicle-oriented land uses



LAND-USE ACTIVITY PROFILE

C13

FRONTAGE WIDTH CONTROL

A) max. B) min.

AIM

- A) to encourage visual diversity of the pedestrian core and to make it compact
- B) to reduce friction in the transition zones.

APPLICATION

- A) narrow fronted, relatively deep lots in the pedestrian oriented core zone, with arcades and possible vertical expansion
- B) the number of ingress and egress points (driveways) per unit length are controlled in the vehicle oriented parts of the centre (e.g. 5/100m - min. frontage width is 20 m)
- implemented slowly over time by private [redevelopment].

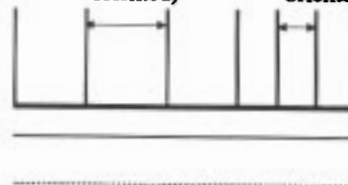
LIMITATIONS

- Tangible results can only expected in medium to long term, and if development or redevelopment is likely to occur.

IMPACT

- A) visually more stimulating pedestrian oriented centre with a well confined conflict area
- B) friction caused by parking manoeuvring can be kept at a tolerable/desirable level.

W min. (vehicle-oriented) W max. (pedestrian-oriented)



C14

FLOOR SPACE RATIO - FSR

AIM

To control the generated number of pedestrians and vehicles to reduce conflict.

APPLICATION

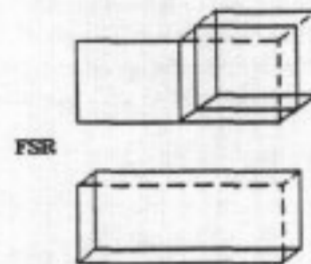
All development control plans (DCP's) should contain detailed measures for the Main Street. Through FSR control the friction caused by parking manoeuvring and turning movements can be controlled in the case of vehicle oriented uses, while in the pedestrian oriented core it will affect the generated number of pedestrians and thus pedestrian density and crossing.

LIMITATIONS

As in the case of frontage width control.

IMPACT

- Possible longer term land use changes
- Friction caused by vehicle manoeuvring and/or pedestrian crossing activity will decrease to a tolerable/desirable level.



C15

CONTROL OF BUSINESS ACTIVITY/ SHOPPING HOURS

AIM

- To reduce friction caused by major traffic generators.

APPLICATION

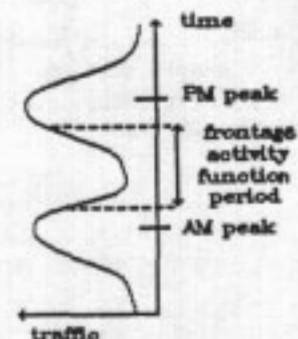
Where the daily fluctuation of traffic is significant with demand in distinct peak periods exceeding the capacity of the roadway, the functioning period of major traffic generators, which cannot provide off-street access facilities, is restricted, with excluding the peak hours from the permitted shopping hours.

LIMITATIONS

- Turnover of affected businesses may fall significantly.
- Implementation and enforcement are difficult both politically, legally and technically.

IMPACT

- Segregation of through and local traffic in peak periods
- Fewer accidents
- Increased road capacity and speed if combined with parking restrictions.



C16

OFF-STREET VEHICULAR ACCESS/ PARKING

AIM

To reduce friction due to parking/delivery and vehicle manoeuvring.

APPLICATION

- In situations where through traffic function is dominant and the conflict between local and through traffic is significant, and businesses suffer from limited on-street access
- Clear signposting and convenient pedestrian access from the car parks are required. Some on-street parking is necessary for convenience shopping and passing trade.

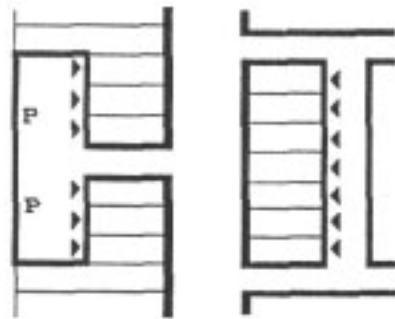
LIMITATIONS

Feasible only if:

- Redevelopment is likely to occur, or
- Back lanes/streets exist and the interior layout of shops can be reorganised accordingly.

IMPACT

- Improved conditions for through traffic (increased capacity and speed)
- Improved convenience in parking for local traffic
- Some loss of passing trade if accompanied by reduction in on-street parking
- More turning movements at some intersections.



C17

INFILL/REDEVELOPMENT

AIM

- To maintain or enhance the character of the centre with responsive design
- To add to the public space.

APPLICATION

- Where vacant or derelict sites exist (infill)
- Where redevelopment is likely to occur and the width of the road reserve is inadequate (colonnades, increased setback, etc.)
- Where lateral expansion is desirable (arcades)

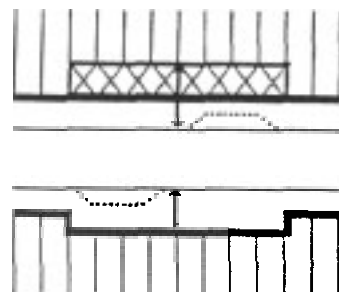
Emphasis on ground floor design and prevailing character (building lines, height, proportions, roofline, fenestration, materials, colour, etc).

LIMITATIONS

- Increased setbacks, varied building line, colonnades can be unsympathetic with the existing character of the centre
- Structure and depth of existing buildings determine the feasibility of colonnades.

IMPACT

- Adequate room for pedestrian activities and some other competing uses (e.g. parking bay)
- Lateral expansion of the pedestrian environment (through arcades)
- Increased visual diversity
- More flexibility for responsive functional design of the public space
- (May provide opportunity for grade-separated pedestrian crossing).



C18

FOOTPATH UTILISATION

AIM

- To improve the quality of the footpath/ped. env.
- To coordinate the actions of various players.

APPLICATION

- Improvements of the pedestrian space are guided by the technique of functional zoning as part of the DCP. Zones with explicit design criteria are established for window shopping, pedestrian traffic, street furniture and landscaping, major entrances and crosswalk areas.

LIMITATIONS

- Careful and site specific considerations are required to determine the design parameters of each zone. Danger of rigidity & uniformity.

IMPACT

- More functional (convenient and safe) pedestrian environment
- Improved aesthetics
- More cost-effectiveness in public sector improvements.

- Zone 1: window shopping (0.6-1.5m)
- Zone 2: pedestrian traffic (w x 0.76m)
- Zone 3: street furniture & landscaping (min.1.5m)
- Zone 4: major entrances (special attention)
- Zone 5: crosswalk areas (special attention)



PEDESTRIAN SPACE ZONING CONCEPT

C19

ADVERTISEMENT CONTROL

AIM

- To reduce the visual complexity (clutter) of the streetscape
- To control visual stimuli.

APPLICATION

- Coordinated outdoor advertising policy/guidelines/controls are introduced to complement or enhance the streetscape and/or to affect speed
- The elements of control may include: number of signs/per site (or unit length), size, purpose/content, placement/location, design, etc.

LIMITATIONS

- Sensitive area specific control requires detailed studies
- Implementation requires effective consultation and working relationship with the shopkeepers.

IMPACT

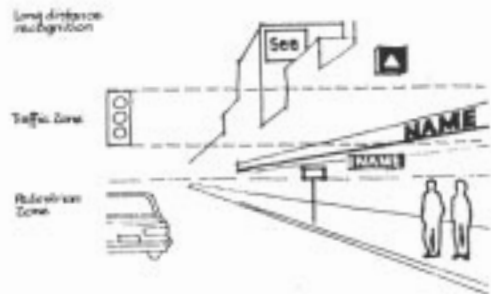
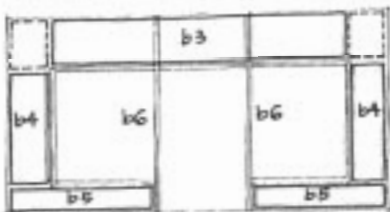
- Improved streetscape
- Compatibility between speed and the rate of information for both drivers and pedestrians (reduced density of stimuli may contribute to the reduction in accident rates).



KEY NUMBER OF SIGNS PER SITE



Cafe



VISIBILITY ZONES



Source: Department of Planning (1991) Outdoor Advertising

C20

STREETSCAPE

AIM

- To improve the appearance and the image of the centre.

APPLICATION

The controls and actions should be based on a careful analysis of assets and detractors. Elements to consider include:

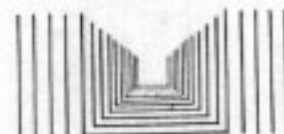
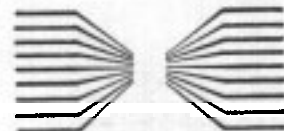
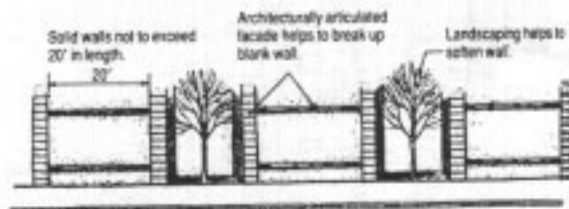
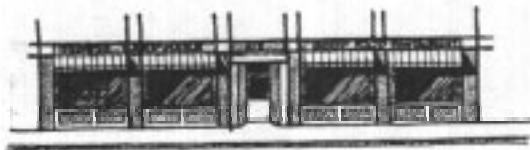
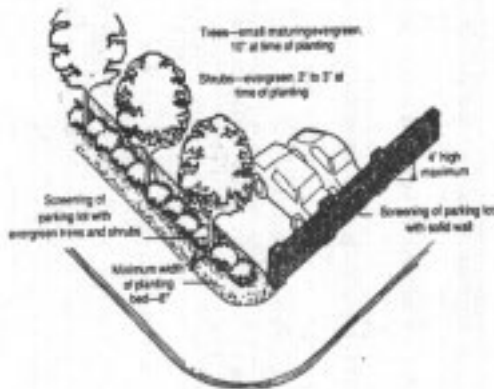
- Space definition (H/W ratio, continuity, setback, active frontage, etc.)
- Roofline/skyline
- Wallscape (interface between the private and public domains)
- Floorscape (both of the footpath and of the carriageway)
- Landscaping, street furniture and signage.

LIMITATIONS

- Property prices and rents may increase which may push out certain businesses
- Effective negotiation and coordination are required between authorities and property owners involved.

IMPACT:

- Increased popularity, growing tourism and local trade
- Increased business turnover
- Increased development activity.



C21

VIEWS AND VISTAS

AIM

- To protect or enhance the identity/character of the centre.

APPLICATION

The DCP of the centre should also include measures for the protection and enhancement of pleasant, and for the hiding of unpleasant, views, with controlling building height/line and envelope, landscaping, and removing over-head powerlines. They may include:

- Closed/end vistas
- Panoramic views
- Grandiose vistas
- Framed views
- Screened views

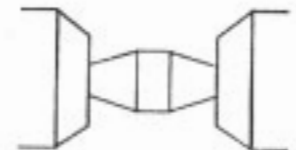
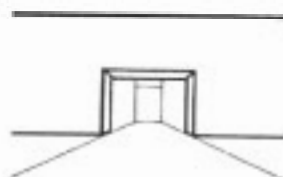
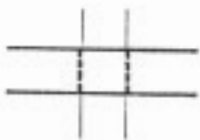
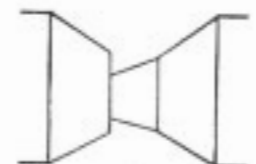
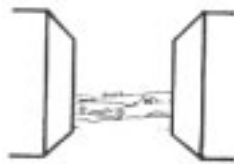
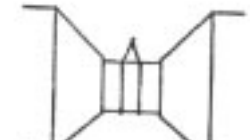
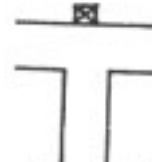
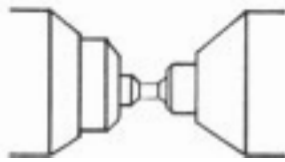
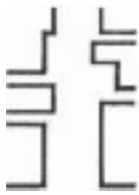
LIMITATIONS

Different levels of visual richness is required for pedestrians and drivers.

IMPACT

Distinct character

- Increased popularity (tourism as well as local trade)
- Decreased speed
- Varied visual experience (serial views).



C22

HERITAGE CONSERVATION

AIM

- To enhance the uniqueness of the place

APPLICATION

Places that have some cultural significance are identified through careful study for conservation. The different degrees of conservation are maintenance, preservation, restoration, reconstruction and adaptation. Besides possible statutory environmental heritage listing, LEP's and DCP's should include provision for their protection. The items may include trees, parks, statues, relics, signs, shopwindows, verandahs, facades, colours, buildings, but whole streetscapes and street layouts, too. Age is an irrelevant factor. It is important that the introduced traffic management devices are sympathetic with the character of the Main Street. (Techn. ref.: DoP, Main Street Handbook)

LIMITATIONS

- As conservation is a process, involving planning, implementation, coordination, monitoring and maintenance, long-term commitment is necessary
- Public education and participation are essential.

IMPACT

- Distinct identity
- Increased community pride and attachment
- Increased tourism
- Rising business turnover.



Priorities for Heritage Conservation

- Recognise the value of heritage
- Know your local history
- Identify information resources
- Know the population
- Ensure adequate repair and maintenance of buildings and features
- Know the government heritage protection powers
- Monitor new development and its effect on the existing character
- Engage conservation consultants where specialist advice is warranted

Source: DoP, Main Street Handbook

D1

OFF-LINE BAYS

AIM

- To decrease friction caused by on-street parking and
- To servicing and/or to create additional parking space.

APPLICATION

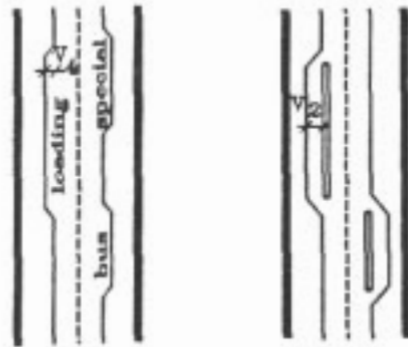
- A) Where footpath width is adequate kerbside bay is provided for loading/unloading, bus stop, taxi stand or parking (parallel or angle)
- B) Where the carriageway width is excessive mid-road parking is provided (parallel or angle).

LIMITATIONS

- Merging and diverging will continue to cause some friction
- Crossfall and awning line may be constraints in the design (A)
- Clear signposting is necessary.

IMPACT

- Increased traffic capacity
- More on-street parking space (B)
- Clear designation of spaces for competing access functions.



D2

DIFFERENT CARRIAGEWAY PAVEMENT

AIM

- To reduce speed
- To make both drivers and pedestrians aware of potential conflict area
- To enhance character.

APPLICATION

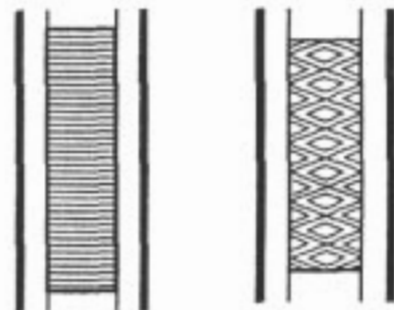
- In the core zone of the center with high level of pedestrian crossing activity where both traffic and pedestrian densities are high
- The repaved section of the roadway has a different texture and colour with or without pattern in the floorscape.

LIMITATIONS

- High cost of repaving
- Should be coordinated with utility reconstruction
- Traffic must be restricted or diverted during construction

IMPACT

- Reduced speed
- Increased number of crossing pedestrians
- Improved appearance.



D3

RAISED PAVEMENT

AIM

- To reduce traffic speeds and improve residential amenity
- To highlight pedestrian crossings.

APPLICATION

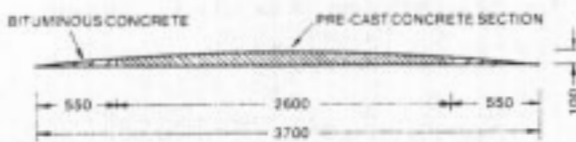
- On main streets with high traffic speeds and high pedestrian activity. Could also be used as entry threshold (refer "gateway" treatment) or in conjunction with pedestrian crossing. This can be achieved in a number of ways: e.g. speed humps and raised platforms.

LIMITATIONS

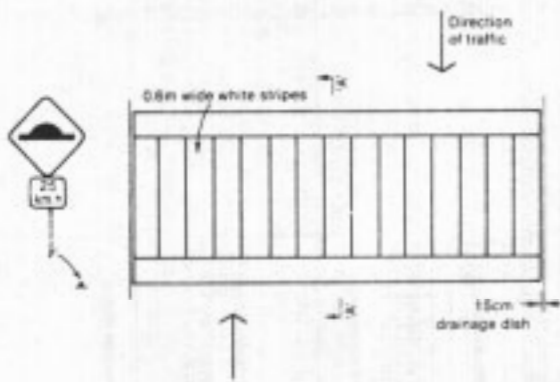
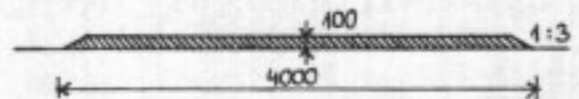
- Not suitable where through traffic volumes are high. Traffic function - veh. - road humps- 10000 veh. - not appropriate
- Main street function - application in commercial areas only
- Reservation width - applicable in all situations.

IMPACT

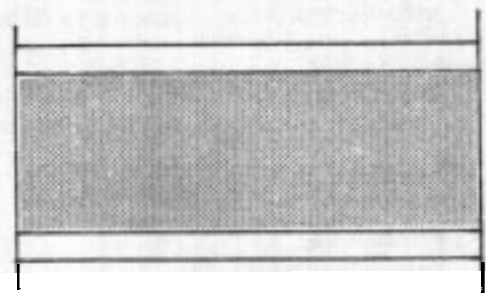
- Reduction in overall traffic speeds
- Improved pedestrian amenity
- Minor inconvenience to motorists
- Can increase noise levels.



CROSS SECTION A-A' OF HUMP



ROAD HUMP



PLATFORM

D4

BYPASS ROADS

AIM

- To remove non local (through) traffic from the Main Street
- To remove heavy vehicles from the Main Street
- To improve the amenity of the Main Street.

APPLICATION

- Town Centres experiencing high noise and/or air pollution through traffic
- Where a bypass route is economically and environmentally possible
- Can be used to remove bypass traffic to streets adjacent to the town centre or to completely bypass the town.

LIMITATIONS

- A bypass route(s) must be available
- The town centre should not rely on business from through traffic
- The alternate routes for through traffic must be constructed to carry the increased traffic.

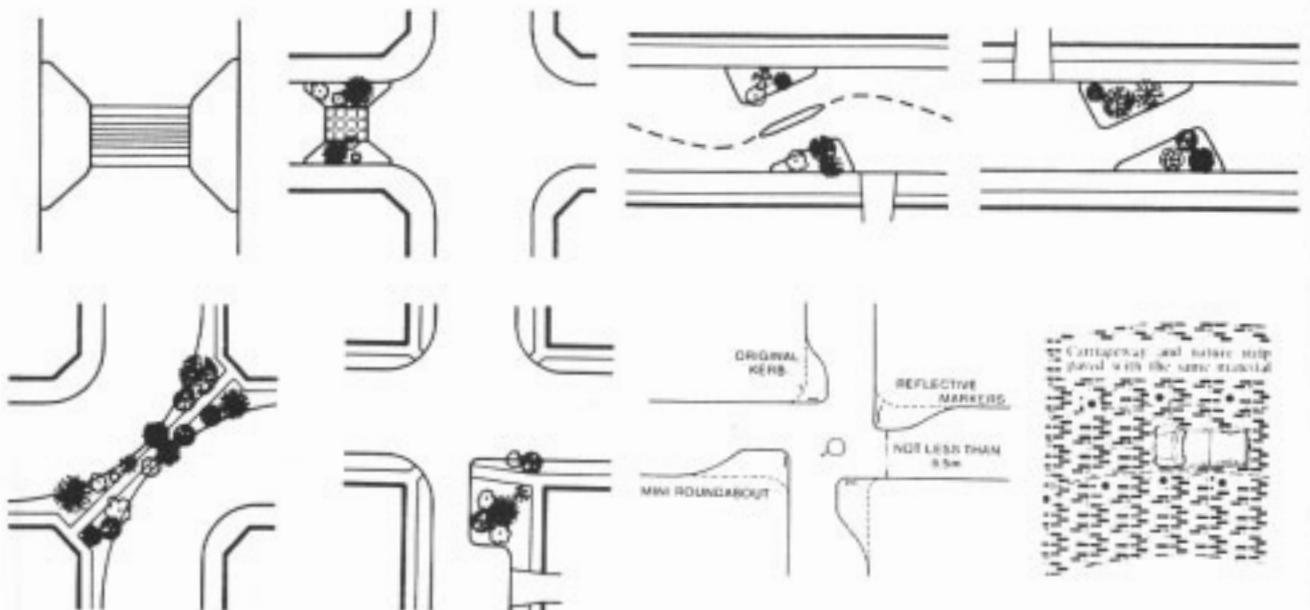
IMPACT

- Environmental problems may be created on the bypass routes
- Reduced traffic in the Main Street can have economic effects on existing shops
- Business activity is likely to be varied initially and some changes of use can be expected.

COMPLEMENTARY MEASURES

The implementation of a bypass road can create opportunities for greater use of the more traditional form of local area traffic management measures such as:

- Speed hump
- Single lane entry threshold
- Two lane angled slow point
- Single lane angled slow point
- Diagonal road closure
- Half road closure
- Catherine wheel
- Shared zone.



D5

STAGGERED ROADWAY

AIM

- To reduce vehicle speeds through the main street.

APPLICATION

- On main street where through traffic volumes are low, existing road width and roadside parking permissible
- Usually a mid block treatment
- Should be used in conjunction with other measures to reduce advance speeding.

LIMITATIONS

- Traffic function -design can be varied to suit the traffic volumes (i.e. kerb blisters when volumes are high, full staggering where volumes are low)
- **Disruption to through traffic**
- **High driver awareness required**
- **Lighting and signposting critical.**

IMPACT

- Reduced traffic speed
- Improved pedestrian amenity
- Increased potential for wider footpaths at selected locations
- Can reduce on-street parking
- High visual obstruction created
- Can increase traffic noise
- Restricts passage for heavy vehicles
- Can cause inconvenience for emergency vehicles.



D6

ROUNDABOUTS

AIM

- To reduce entry traffic speeds and to improve local road connections.

APPLICATION

- Preferably at intersections (due to benefit to local access) but also effective midblock if clearly marked.

LIMITATIONS

- Not appropriate where pedestrian activity is high
- Relatively high construction cost, but virtually no maintenance cost.

IMPACT

- Reduction in vehicle approach speed
- Improved local traffic access
- Possible increase in noise in outskirts of town affecting residential amenity
- Require appropriate lighting and signposting
- Can reduce opportunity for pedestrians to cross the roads.



D7

T - JUNCTION REARRANGEMENT

AIM

- To better reflect traffic movement with priority
- To reduce vehicle conflicts.

APPLICATION

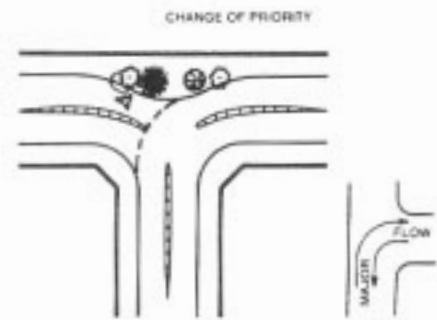
- Where volumes/speeds are high on stem of T
- Use signing, linemarking to change priority used in conjunction with by-passes and malls (See D4 and D15).

LIMITATIONS

- May not be suitable for narrow streets
- Can be confusing and/or inconvenient for pedestrians and drivers.

IMPACT

- Reduced speed
- Possible increased noise.



D8

STAGGERED JUNCTIONS

AIM

- To reduce cross traffic in the Main Street.

APPLICATION

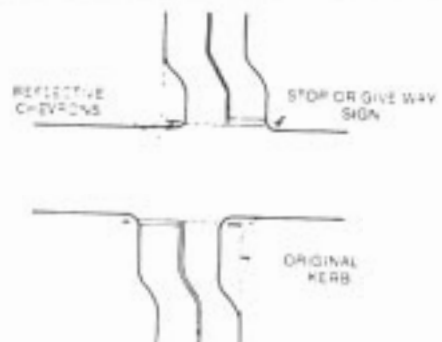
- Where there is a high volume of cross traffic using a particular intersection
- Where traffic flow in Main Street must be maintained
- Where accident histories at the intersection are high.

LIMITATIONS

- Requires alternate routes for cross traffic.

IMPACT

- Discourages through traffic in the minor road by increasing intersection delay
- Reduced speeds at intersection
- Possible reduction in accidents
- Can disrupt bus routes out of side street
- Inconvenience to local traffic
- May increase traffic along sections of the Main Street
- Can be confusing for non-local traffic.



D9

RAISED PAVEMENT WITHIN INTERSECTION

AIM

- To reduce vehicular speed at intersection.

APPLICATION

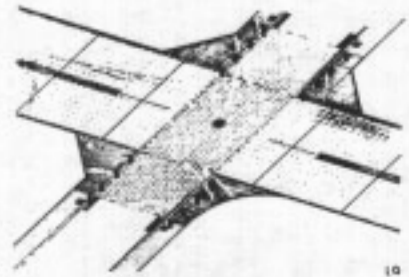
- Gateway entrance treatment
- Mid-block intersection treatments.

LIMITATIONS

- Can require drainage alterations
- Should be used in conjunction with other treatments
- Often an expensive treatment.

IMPACT

- Reduced vehicle speeds
- Highlights intersection
- Increased pedestrian safety
- Increased vehicular safety
- May be noisy
- Visually attractive.



D10

TWO LANE ENTRY THRESHOLD

AIM

- To provide an entrance gateway to Main Street
- To discourage through traffic
- To reduce entry speed.

APPLICATION

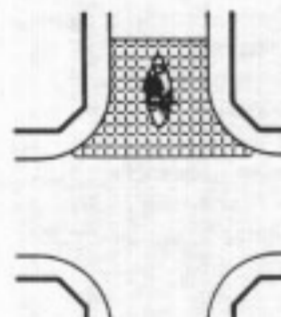
- At the boundaries of Main Street project.

LIMITATIONS

- Can create traffic congestion at Main Street entrances
- Reduced opportunity for turning movements.

IMPACT

- Reduced entry speed
- Improved pedestrian safety at threshold
- Improved appearance to streetscape ducts opportunities for landscaping
- Provides definition for the boundaries of the Main Street.



D11

GATEWAY

APPLICATION

- In strong pedestrian oriented centres where drivers' behaviour should substantially be modified
- In centres which lack a distinct image.

At either end of the centre or the core zone a "gate" is created through the various combination of road constriction, threshold/contrasting pavement, portal/arch, tree canopy, signpost, flagpoles, special lighting, etc.

IMPACT

- Increased driver's awareness
- Reduced speed, compatible with the core zone
- Improved image/character
- A landmark,

AIM

- To make the driver aware of the change in the road environment
- To mark entrance to the centre
- To create an image of the centre.

LIMITATIONS

- Minor loss in on-street parking
- Visibility should be carefully checked
- Certain designs (e.g. portal) may not be sympathetic with the character of the environment (e.g. heritage buildings).



D 12

TREE PLANTING IN MEDIAN

APPLICATION

- Wide main streets along the length of commercial activity
- Where verandahs/awnings prevent tree planting on foot-paths.

IMPACT

- Distinctive demarcation of area of high pedestrian activity
- Aesthetic amenity
- Reduction in glare and dust.

AIM

- To indicate commercial zone and create a distinct character for it
- To indicate pedestrian activity.

LIMITATIONS

- Narrow growing area
- Species selected need to be tall with high canopy
- Visibility of crossing pedestrians should be carefully checked.



D 13

TREE PLANTING IN ROAD SHOULDER

AIM

- To provide shade and reduce glare
- To define street volume
- To reduce rainfall impact
- To reinforce heritage planting.

APPLICATION

- Where road is wide
- Where there is a previous history of tree planting in shoulder to reinforce cultural landscape character
- Where street space definition is required
- Where there is a need to ameliorate urban runoff.

LIMITATIONS

- Not appropriate for narrow streets
- Robust tree guards are needed
- Only trees with straight trunks and high spreading canopy
- Overhead powerlines may need to be modified to aerial bundle cables
- Porous material is desirable for planting.

IMPACT

- Street space definition and identity
- Dust and pollution filtration
- Reduction in storm water runoff
- Shade and glare control.



D14

SHARED SPACE

AIM

- To reduce traffic speeds and to improve pedestrian amenity.

APPLICATION

- Where traffic flows are generally low and the majority of traffic destinations are within the same area. Not generally applicable when through volumes are high unless alternative routes to divert through traffic exist
- Vehicle path may be designated by bollards, paint, or different pavement.

LIMITATIONS

- Traffic function - Not applicable unless volumes smaller than 1,000 vph
- Main street function - applicable in commercial areas where pedestrian activity is high
- Reservation width - most appropriate in narrow reservation widths (i.e. <30m)
- Demands greater attention/awareness of drivers
- Relatively high cost.

IMPACT

- Reduced vehicle speeds
- Discourages through traffic
- Creates additional parking and footpath space
- Streetscape improves
- Improved pedestrian amenity.



D15

ROAD CLOSURE MAIN STREET

AIM

- To eliminate through traffic in the Main Street
- To create a traffic free environment for pedestrians
- To provide additional space for landscaping, car parking, pedestrian activities, etc

APPLICATION

- Where there are alternate routes for through traffic e.g. by-pass routes
- Where the Main Street carries high proportions of through traffic and includes a high proportion of heavy vehicles, semi trailers, etc
- Where the Main Street has the potential for high pedestrian activity.

LIMITATIONS

- If traffic cannot be rerouted
- Access/delivery must be maintained to premises either from rear or front of the mall
- Generally a high cost solution.

IMPACT

- Can meet with opposition from shop owners
- Affects emergency vehicle access
- Confusing for non regular drivers
- Increased travel distance for motorists
- Improved environment for shoppers
- Safer parking and unparking
- Can change the uses of some shops and commercial properties due to change in turn-over and property prices.



D16

SIDE-STREET CLOSURE

(mini malls)

AIM

- To increase pedestrian space and amenity
- To eliminate or simplify intersections.

APPLICATION

- In centres which need additional pedestrian attraction
- Where there is heavy pedestrian traffic along the Main Street
- Where there are too frequent intersections
- Where vehicular access from the side street is not essential
- Where pedestrian generators tend to concentrate around particular corners and/or side- streets.

LIMITATIONS

- Local travel should not be increased substantially
- Feasible only if the side street has shops or community facilities, or if its buildings next to the main street have a potential for adaptive commercial reuse.

IMPACT

- Increased pedestrian activity and business turnover in the vicinity
- Increased safety for both pedestrian and vehicular traffic
- Opportunity for erecting some special feature (e.g. fountain or clocktower) to create a special atmosphere and to increase the amenity of the area
- Decreased vehicular accessibility and minor loss in on street parking
- Decreased legibility for drivers
- Reduced access for emergency and delivery vehicles.



D17

SHARED/RAISED PED. CROSSING

APPLICATION

- In strong pedestrian oriented centres with relatively low (mainly local) traffic volume but high speed
- Where vulnerable groups of pedestrians are present in high proportions
- In front of major pedestrian generators
- The pedestrian crossing, or a longer section of the roadway is raised to the level of the footpath. The road width is kept to a minimum.

IMPACT

- Increased driver's awareness
- Greatly reduced speed at conflict points
- Increased pedestrian crossing activity
- Slightly reduced traffic volume
- Improved appearance.

AIM

- To mix pedestrians and vehicles safely at points of potential conflict
- To improve the pedestrian environment.

LIMITATIONS

- Loss in on-street parking and passing trade (if a shared zone)
- Can be costly if drainage pits need adjustment (spot treatment)
- Expensive if more than a spot treatment.



D18

STREET LIGHTING

APPLICATION

- Where traffic volumes are high, particularly along major tourist routes with high night-time travel. Also applicable where night time pedestrian activity is high
- Lighting of vehicular and pedestrian space may be treated differently.

IMPACT

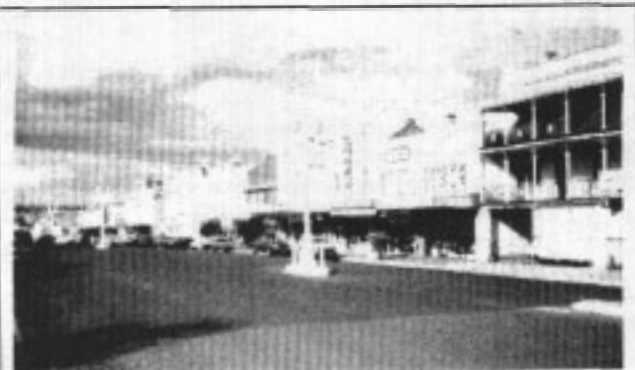
- Improved driver visibility/awareness
- Improved pedestrian security
- Improved pedestrian visibility
- Improvement to roadside businesses
- Annoyance factor of lights to nearby residents
- Relatively high installation and maintenance costs
- Energy consumption.

AIM

- To improve pedestrian and traffic safety.

LIMITATIONS

- Awnings, existing poles and wires
- Spacing and location should be coordinated with land-use activities (e.g. pedestrian crossings).



D19

CARRIAGEWAY/ LANE NARROWING

AIM

- To widen pedestrian space and improve amenity
- To reduce vehicular speed and/or flow.

APPLICATION

- At selected locations or longer section where the width of the road is excessive
- Where the volume and speed of traffic cause barrier effect for crossing pedestrians
- Where crossing movements cannot be concentrated effectively.

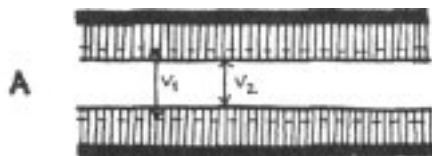
The treatment includes footpath extension, axial shift in the roadway, central landscaped median, or mid-road parking.

LIMITATIONS

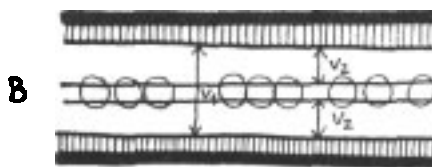
- It is not feasible to widen the footpaths if the crossfall of the road is high
- If median creates divided carriageway the min. width for each roadway is approx. 5m
- Not feasible where (through) traffic volumes are high (close to road capacity).

IMPACT

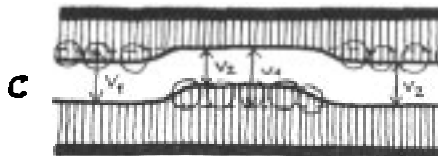
- Decreased pedestrian density on footpaths (A, B)
- Reduced speed and/or volume (A, B, C, D)
- Increased opportunity for landscaping and street furniture (A, B, D)
- More parking space (C)
Landscaping can discourage jaywalking (B).



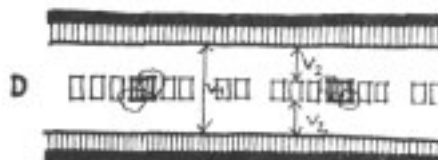
extended footpath



landscaped median strip



staggered footpath extension



parking in the middle

D20

RAILING OF FOOTPATH/ MEDIAN

AIM

- To prevent jaywalking
- To improve the level of traffic service.

APPLICATION

- In centres with strong traffic function and serious pedestrian/vehicle conflicts where jaywalking should be reduced.

A) the footpath, B) the median is fenced with rail or raised landscaped nature strip.

LIMITATIONS

- Kerbside parking and loading/unloading become inhibited (A)
- The min. width of the median is 1.0m for railing and 1.5m for nature strip.
- Unexpected, and therefore more serious conflict if jaywalking does occur.

IMPACT

- No pedestrian spillover onto the roadway (A)
- Higher perceived level of protection for pedestrians (A)
- Conflict due to pedestrian crossing is concentrated to a few selected points
- Increased potential (on railing) for outdoor advertising.



D21

GRADE-SEPARATED PEDESTRIAN CROSSING

AIM

- To reduce vehicle/pedestrian conflicts.

APPLICATION

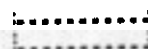
- Where there is space for ramps or stairs or multi-level building development is occurring
- Where it is important to maintain traffic flow on the Main Street
- Where other forms of pedestrian crossing are impracticable or should be complemented.

LIMITATIONS

- Usually only suitable where there is multi-storey business development or redevelopment on either side of Main Street
- Difficult for disabled persons
- Very expensive and unlikely to be appropriate for country towns
- May be unsympathetic with streetscape character
- Requires private sector cooperation.

IMPACT

- Can increase vehicle speeds and activity on Main Street
- Can make pedestrian access very private (biased toward particular developments)
- Can increase space for advertising.



D22

FOOTPATH (PAVEMENT) DESIGN

AIM

- To improve the functional and aesthetic qualities of the pedestrian space.

APPLICATION

- In the pedestrian ~~core~~ where the pavement of the footpath is in a poor condition
- When reconstruction of underground utilities becomes necessary
- Footpath extension may be applied at selected locations (e.g. in front of civic buildings to mark their entrance with a distinct "forecourt").

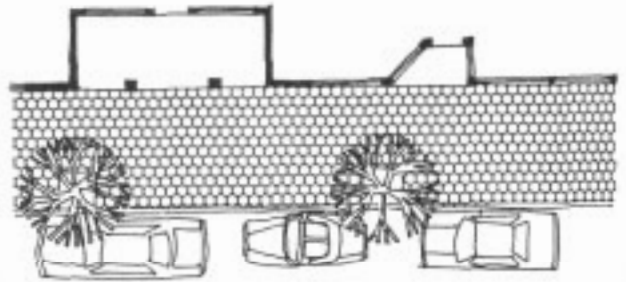
The floorscape can be neutral and patterned, and can even include some simple signs (e.g. street name, numbers, etc.) and other features.

APPLICATION

- Repaving should be planned in advance and coordinated with public utility improvement programs
- Man-holes should be integrated with the floorscape
- High cost.

IMPACT

- Increased attractiveness and consequent increase in pedestrian activity and business turnover
- Maintenance (cleaning) may become easier.



D23

AWNING/ VERANDAH

AIM

- To provide protection for pedestrians against weather impacts and
- To create enclosed secondary space for pedestrians.

APPLICATION

- Continuous overhead protection along the the pedestrian core of the centre
- Where the attraction of more pedestrian street activity is desirable
- Where space is very limited, awnings can be combined with landscaping
- Combination with pedestrian lighting is desirable
- Advertising and streetscape unifying potential of awning fascias.

LIMITATIONS

- Existing mature trees and/or poles may be obstacles
- In the case of some delicate heritage buildings it may not be possible to integrate the awning with the design of the facade.

IMPACT

- Increased convenience and attraction of the centre for pedestrians
- Awnings (and tree canopies) can define more enclosed and intimate secondary spaces within a wide, loosely defined road space.



D24

TREES IN FOOTPATHS

AIM

- To provide shade for cars
- To reduce pollution.

APPLICATION

- Where footpaths are wide
- Where there is a high activity core for pedestrian use
- Where the building facades are not particularly attractive.

LIMITATIONS

- Where verandahs and awnings exist
- Overhead powerlines need to be modified to aerial bundled cables
- Only trees with tall straight trunks and high spreading canopy
- Avoid visibility conflict with signage
- Vandalism may require frequent replacement.

IMPACT

- Shade
- Dust and pollution filtration
- Definition of secondary pedestrian space
- Improved streetscape
- Obstruction of the visibility of some outdoor advertisements.

