SUBDIVISION AND INFRASTRUCTURE DEVELOPMENT IN HASTINGS DISTRICT

Best Practice Design Guide

HASTINGS DISTRICT COUNCIL

DRAFT: Dated 18 December 2009

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Publication prepared for: Hastings District Council
by: MWH Ltd + Vivacity Ltd October 2009

A

INTRODUCTION

A1 Objective

The overall objective of this guide is to ensure that new subdivisions and the upgrading/ retrofitting of infrastructure enhance the quality of the Hastings District.

A2 Purpose of the Guide

The purpose of this guide is to give developers and subdivision designers a design process and guidelines on best practice subdivision and infrastructure design. Conventional design solutions are often not consistent with sustainable development principles and in many cases they are not delivering high quality places for people. This guide sets out best practice design principles and illustrates their application in subdivision and infrastructure planning and design – for both the development of urban subdivisions and the retrofitting of existing neighbourhoods. A theme throughout this guide is generating multiple benefits such as the retrofitting of streets; provision of street calming through narrower carriageways; the implementation of low impact urban design techniques; increased amenity through planting; and potentially with reduced costs of construction and long term maintenance.

A3 Scope

Traditionally, subdivision has emphasised maximising lot yield and meeting minimum engineering and surveying requirements. However, it is also important that subdivision and retrofitting also compliments the local identity of the Hastings District and responds to the site, neighbourhood characteristics and local aspirations.

This guide provides practical examples of how subdivisions and retrofitting of above ground infrastructure can be located and designed, from overall layout to the individual lot and street design, in ways that achieve benefits to the subdivider, residents, the community and the environment. It emphasises responsive and innovative design.

Developers are encouraged to look beyond the minimum standards and consent requirements of the District Plan and Engineering requirements, and to explore opportunities that will enhance and create a better urban environment, for now and which will last well into the future.

Subdivision designs that exhibit innovation and careful consideration of the issues identified in the guideline, and which achieve multiple benefits, are more likely to be supported by the Council.

A4 The Council's Approach

Hastings District Council is committed to the promotion of best practice sustainable outcomes for the district.

This Subdivision and Infrastructure Development Design Guide will assist both the subdivider/developer – who is responsible for designing and subdivision or infrastructure retrofit - and the Council - which assesses the merits of the proposed design. The guide demonstrates acceptable design solutions when implementing the requirements contained in Land Development and Subdivision Principles and Requirements 2009 document. It has status under the RMA (s. 104 (1) c)) in that it should be considered as part of the resource consent process. The design principles can also be used when the subdivision and development provisions of the District Plan are reviewed.

No precise formula exists for the planning and design of subdivisions and retrofitting of infrastructure. The Design Guide outlines design principles that new developments are expected to observe but it allows flexibility in terms of detailed design.

Hastings District Council is a signatory to the New Zealand Urban Design Protocol (UDP) developed by the Ministry for the Environment. The UDP identifies seven essential design qualities that create quality urban design, known as the seven Cs. They are; Context, Choice, Connections, Creativity, Character, Custodianship and Collaboration. This guide is one of the tools the Council and the development community can use to achieve these seven urban design qualities.

A5 Users

The intended users of this guide are:

- ☐ developers – both public + private
- ☐ council staff
- ☐ land owners
- ☐ planners and policy makers
- ☐ surveyors
- ☐ engineers
- ☐ landscape architects
- ☐ architects, and
- ☐ others involved in land development and infrastructure upgrades

B

DESIGN PRINCIPLES

B1 Design Principles

The following principles were developed as part of a workshop with Council officers and others that are involved in subdivision and development in the Hastings District. They underpin the guidelines which are acceptable design solutions for subdivisions and the retrofitting of infrastructure.

They respond to the key issues and opportunities that should be addressed in the design of subdivisions and the upgrading of above ground infrastructure which significantly influence the quality of the built environment. These principles are illustrated in the design guidelines that follow.

SELECT

a suitable site for subdivision or retrofitting. Some locations have greater ability to absorb development than others and some sites are more suitable for retrofitting due to the condition of the infrastructure.

INTEGRATE

natural elements, patterns and processes into the design. This could include vegetation, landforms and waterbodies to enhance the existing character, create identity and maintain and enhance natural ecosystems.

RETAIN

heritage and special character areas, drainage patterns, landform, view corridors, open space, natural features and links with other areas.

ENHANCE

ecological systems and processes in a way that accommodates development while improving ecology. Use plantings which are compatible with Hastings District ecosystems and climate, suitable for the site, and of a scale that relates to the underlying and surrounding landscape.

RESPOND

to community expectations and needs, cultural diversity and climate change. Urban subdivisions and retrofitting should complement the local identity of the Hastings District and respond to site, neighbourhood characteristics and local aspirations. Design for resilience to changing influences such as climate change.

REDUCE

the impact of land and infrastructure development and stormwater runoff and other infrastructure through the use of low impact design principles and practices and reduce the reliance on vehicular transport through encouraging walking/cycle friendly neighbourhoods.

SAFE

and healthy developments are those that provide for visual surveillance over public spaces such as roads, reserves and open spaces, where traffic speeds are compatible with pedestrians/cyclists and where subdivisions are orientated to maximise solar gain.

CONNECT

with the surrounding community through walkways, cycleways and the roading network. This can provide greater accessibility and travel choices reducing travel distances and vehicle emissions. Connect publicly accessible open spaces and reserves to the wider recreation network.

CHOICE

of lot sizes, housing, community and recreational facilities and transportation options will respond to the changing needs of the community and enhance the diversity of the community.

DELIVER

best practice subdivision and infrastructure to create great places to live, work and play through enabling, encouraging, engaging and exemplifying. This includes improved pre-lodgement processes, the use of multi-disciplinary teams in responding to subdivision design and in the design of infrastructure upgrades and retrofitting, Council “walking the talk” through demonstration projects and through community engagement.

C

SUBDIVISION PLANNING

C1 Subdivision Planning Process

A well considered and planned project is critical to achieving smart design that contributes to the environmental, cultural, social and economic wellbeing of the community. Understanding a logical process and the key activity and information requirements at each stage provides for a well planned and efficient subdivision planning process.

BENEFITS

Identifies potential design or consenting issues upfront before spending time and money on the project.

Saves time and costs in the design and redesign where constraints were not identified early in the process.

Helps to build a good relationship with those with an interest in subdivision design and development.

May streamline the consent process where it can be demonstrated that there are significant benefits to the wider community and environment.

Enables innovative design that retains natural landforms and features where possible.

Enables the retention of cultural elements in or around the site, creating or retaining a unique identity for the development.

Enables cost effective and responsive design.

*Will achieve design principles: **Select, Deliver, Respond***

This section provides an overview of this process and key elements to consider at each stage.

Key Stages to an Effective Subdivision Planning Process:

1.Context Analysis

Identify and analyse elements that contribute to the wider context of the site e.g. landforms, transport patterns, development patterns, open space, community facilities, waterways, surrounding landuses etc.

2. Site Analysis

Identify and analyse site characteristics, constraints and opportunities to develop a comprehensive understanding of the site. This could include natural features, topography, orientation, aspect, accessibility, natural hazards, soil types, groundwater levels, climatic conditions including solar gain and wind exposure, existing infrastructure and buildings, previous land use, cultural or historic features.

3. Planning Requirements

Research and understand the planning requirements that apply to the site. This could include requirements of the Resource Management Act, Regional Policy Statements, Regional Plans, District Plan, National Standards and Policy Statements, Development Strategies and Guidelines, Engineering Codes of Practice, Design Guides etc.

4. Consultation

Discuss the development proposal with parties who may have an interest in the development including Councils, neighbours, tangata whenua, interest groups etc.

5. Subdivision Design

Use all of the information collected in the above steps to inform the layout and design of the subdivision or development.

C2 Hastings District Context

An understanding of the wider context in which a project will fit is fundamental to ensuring the design responds to and enhances local features and values. The Hastings District has multiple features that should influence the design of subdivisions and infrastructure.

District

The landscape of the Hastings District is an expression of geological processes, which have resulted in five distinct landform units. These are the Central Ranges, North Western Hills, Lowland Hills, Heretaunga Plains and the South East Coastal Hills. Apart from ranges, the District is almost devoid of native vegetation and therefore the natural character of the landscape owes more to landform patterns or geomorphology than to native vegetation.

Communities

The Hastings District urban centres comprise of the main urban centre of Hastings City with the satellite settlements of Havelock North, Flaxmere, Clive and Whakatu. These urban areas are all born out of serving the productive land use of the Heretaunga Plains and as such are located on or at the edge of the Plains. The economy of the Hastings District has developed from processing, manufacturing and commercial activities associated with the production of the Plains (horticulture, viticulture, agriculture and orchards), and while these activities still provide a strong base for the economy, Hastings City has developed into a substantial urban centre in its own right.

Flaxmere, Havelock North and Clive maintain a rural settlement atmosphere, with Havelock North in particular having a special village atmosphere which is a product of its compactness and quality of urban form.

The coastal settlements of Waimarama, Te Awanga, Haumoana, Whirinaki, Tongolo and Waipatiki began as seaside 'bach' communities but are now made up of a mixture of permanent residences and holiday homes. These settlements maintain a holiday settlement character typical of such settlements across New Zealand.

Streetscape

Because the significant urban centres in the Hastings District are predominantly located on the Heretaunga Plains the streetscapes are characterised by a grid pattern oriented in a north/south and east/west direction. In Hastings, this street pattern allows views to the Kaweka Ranges in the west and Havelock Hills and Te Mata Peak to the east from many locations across the city. Street corridors are typically wide and maintain a sense of open space that relates to the vastness of the surrounding plains.

In residential areas the built form is currently characterised by single dwellings on large sections with mostly 20m frontages and a small amount of medium density housing closer to the city centre. Spanish Mission style architecture is common in Hastings, particularly in the commercial centre where buildings are typically two storied and centred on a pedestrian only town square.

Future Vision for Hastings

The following is the vision for Hastings as outlined in the Hastings District Council's Long Term Council Commmunity Plan.

*"**Great living, for a sustainable future.** We will progress as town and country together and sustain our natural resources, enhace our valued lifestyle, culture and heritage, and build a strong economy and community founded on innovation and partnering for success. Hawke's' Bay will be the premier land based production region of the South Pacific."*

C3 Neighbourhood Context

Great neighbourhoods reflect local character, offer choice and celebrate diversity. Consideration of how a subdivision can enhance the characteristics and functionality of a neighbourhood is critical to delivering quality of life, place and environment.

BENEFITS

When a neighbourhood analysis is included as part of the subdivision proposal, it allows Council staff to gain a greater understanding of the rationale and logic behind the site design.

Provision of a thorough neighbourhood analysis will support an efficient consent process, saving time and money.

Increased opportunity to enhance neighbourhood quality and function by understanding the local context in which a project will fit.

*Will achieve design principles: **Connect, Select***

A successful and sustainable local neighbourhood is a product of the distances people have to walk to access daily facilities, the presence of a sufficient range of such facilities to support their needs, and places and spaces where a variety of activities can take place. Successful communities are a mix of landuses, open spaces, activities and services including commercial, educational, health, spiritual, civic and recreational uses. In an ideal situation these are all conveniently located close to where people live to maximise social interaction and minimise travel to work congestion. Good movement networks are critical to the development of successful communities.

At the beginning of the subdivision planning process wider contextual issues need to be identified. This is where Council involvement as early as possible will help to assist the concept development and refine any design ideas ensuring that the consent process is as smooth and efficient as possible. Council staff have an excellent knowledge of the underlying issues which may influence the development of an area and can assist in identifying opportunities as how a site may 'fit' into the wider context of the neighbourhood. It is also likely to reduce potential requests from Council for further information saving time and money.

There are a number of elements which are essential to planning a successful subdivision or community and which should be identified as part of the contextual analysis:

- The existing and planned built environment including local commercial centres, open spaces (parks), schools and other community facilities, medical centres, churches, scale of buildings, housing typology and landuse density;
- Movement Networks (arterial roads, local roads, cycleways, pedestrian routes and desire lines) and the opportunity to create highly connected, walkable and cycle friendly communities which relate to the built environment;
- Infrastructure, both existing and planned, and any possible capacity issues;
- Existing natural features such as waterways, topography, viewshafts or significant trees or native vegetation should be incorporated into the subdivision design.
- Need to consider downstream capacity and sensitive recieving environments.

This photo illustrates a good relationship between the street and built form, allowing for outdoor cafes, a high level of passive surveillance and a clear path for pedestrians.

The plan to the right shows an assessment of the neighbourhood context highlighting adjacent landuses, existing and planned built environment, movement networks, infrastructure, existing natural features, community facilties and recreational opportunities.

1 Site

2 Local shops /mixed use

3 School

4 Reserves / parks / open space

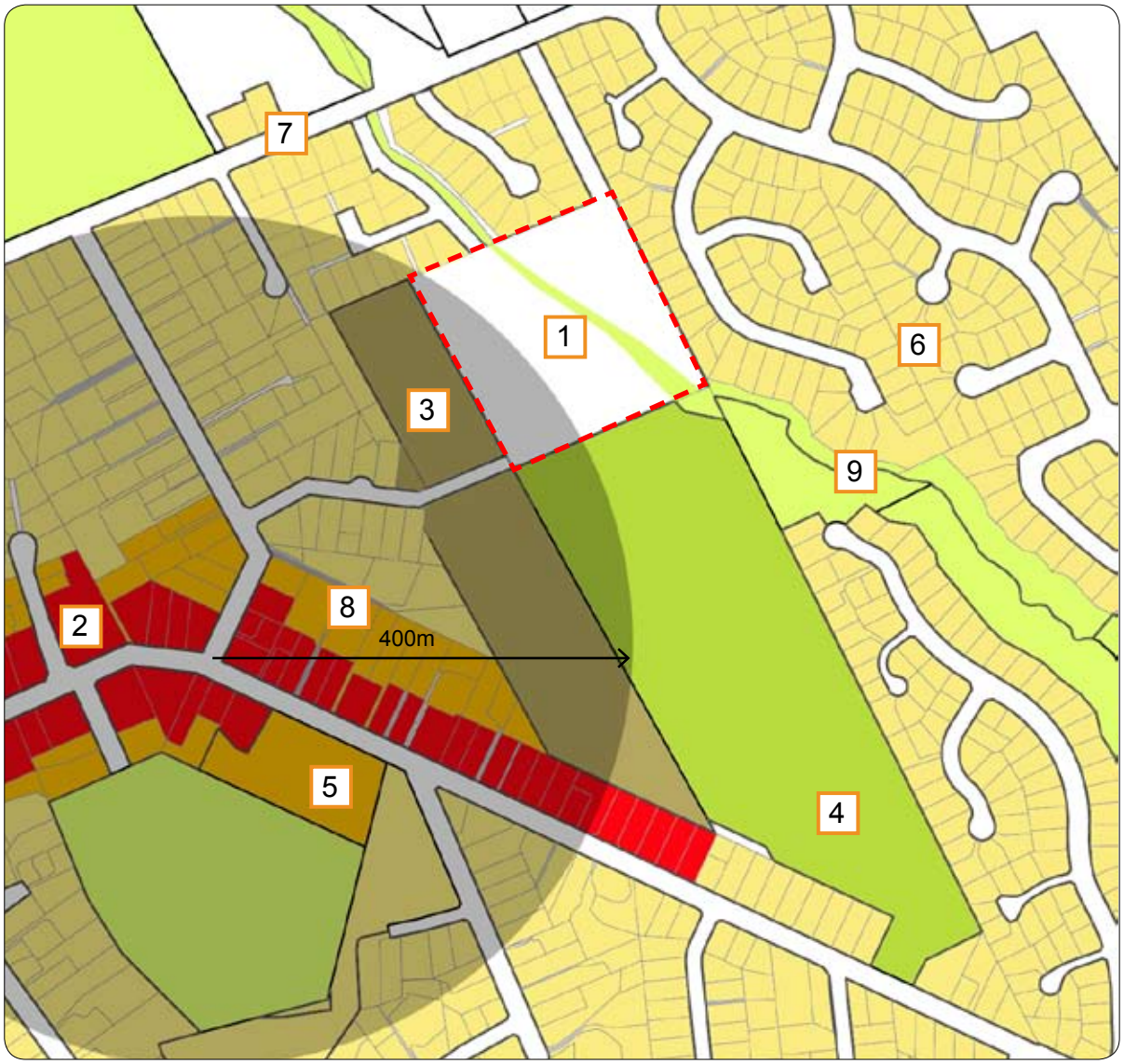
5 Employment (Commercial and Light Industrial)

6 Residential

7 Road Network

8 Walkable catchment from the site (400m diameter = 5 minute walk)

9 Existing stream/drain



C4 Site Analysis

Understanding the characteristics of a development site forms the basis of an effective design process. The ability to identify site constraints and opportunities and explore development options is critical to the preparation of a quality design proposal.

BENEFITS

Inclusion of a comprehensive site analysis with a subdivision application can facilitate an efficient proposal review and approval process. A site analysis provides a rationale for the design and will assist Council officers in understanding the logic behind the design.

Carrying out an integrated design approach from the start of the project allows for greater integration with the surrounding context, highlights special features and creates opportunities, all of which combine to create a richer, higher value proposal.

*Will achieve design principles: **Integrate, Retain, Choice, Connect***

For all sites, no matter how large or small, a detailed analysis of the site and the surrounding neighbourhood context as outlined in the previous section should be undertaken. A site analysis forms the basis for identifying physical constraints and opportunities which could potentially enrich a subdivision design.

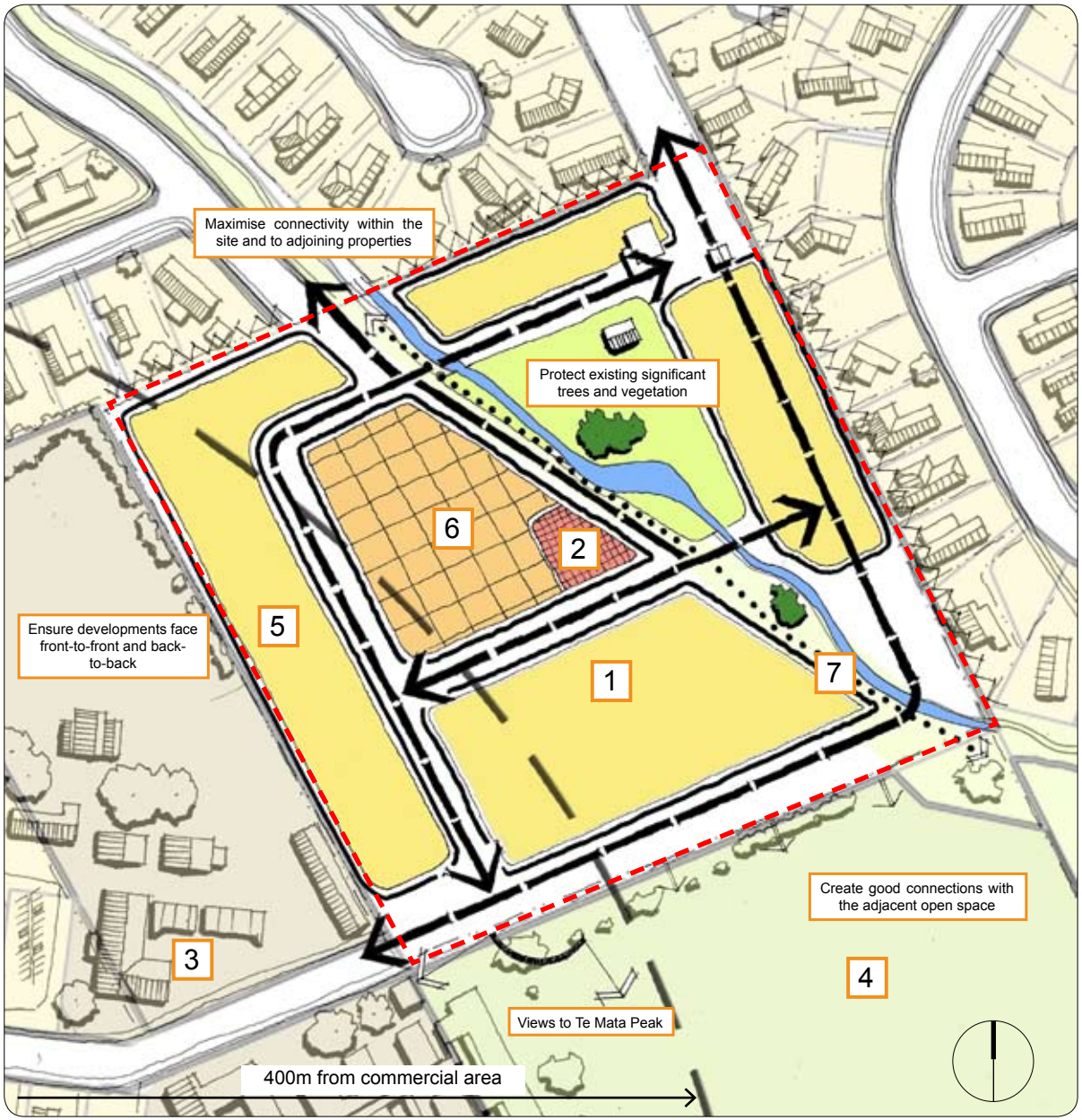
The site analysis should be discussed and developed with neighbours, interested groups and Council staff to identify all of the relevant issues.

Elements to consider in a site analysis include:

- ☐ Topography and landforms, natural features, wetlands, springs and streams
- ☐ Existing native vegetation and significant trees
- ☐ Soils and groundwater
- ☐ Coastal conditions
- ☐ Viewshafts, site orientation, solar, wind and climatic conditions
- ☐ Existing buildings and structures
- ☐ Heritage and cultural elements
- ☐ Surrounding road network and possible connection points
- ☐ Possible future road connections
- ☐ Reserves, parks, open spaces
- ☐ Existing and proposed cycleways, walkways or bridle paths which link with the site
- ☐ Existing pedestrian desire lines which may exist through the site
- ☐ Drainage, stormwater paths and any downstream capacity constraints
- ☐ Existing and proposed water and sewer infrastructure and any capacity constraints
- ☐ Possible contamination issues
- ☐ Natural Hazards, e.g. flooding, coastal erosion
- ☐ Location of nearby shops, schools, commercial or community facilities
- ☐ Character of the surrounding area, in terms of landuse, density and building types.

The plan to the right shows a site analysis highlighting possible development constraints and opportunities.

- 1 Site
- 2 Potential location for local shops /mixed use
- 3 Existing School
- 4 Existing reserves / parks / open space
- 5 Proposed Residential - low density ~600m^2 sections
- 6 Proposed Residential -medium density ~250m^2 sections
- 7 Drainage flow and expected road fall
- Connections to the existing road network and internally
- Walkable catchment (400m diameter for the main commercial area = 5 minutes walk)



From a detailed site analysis and identification of the neighbourhood context, it is possible to plan and create a comprehensive subdivision design which responds to local conditions.

Elements to consider in a site analysis include:

- 1 Site
- 2 Possible local shops /mixed use
- 3 School
- 4 Reserves / parks / open space
- 5 Proposed Residential - low density ~600m^2 sections
- 6 Proposed Residential -medium density ~250m^2 sections
- 7 Connections to the existing road network and internally
- 8 Stormwater corridors and flow paths

C5 Community Facilities

Good neighbourhoods are not just about residential housing stock. They have a wide range of community facities and activities in close, walking proximity which cater to local residents' needs.

BENEFITS

Planning for and providing community's facilities at the early stages of the subdivision design avoids the need for future retrofitting.

Community facilities add to the richness of a community and are a long term asset for residents, adding value to the neighbourhood.

If sited well, community facilities can reduce the need for car dependency, assisting to create a walkable neighbourhood.

Will achieve design principles: ***Choice, Safe, Deliver***

Providing well located community facilities within a neighbourhood / development can reduce the need for car dependency while also increasing the independence of children and the elderly alike who may otherwise be dependant on others for transport. Facilities can also form a focal point to a community, often providing a congregation point where locals can meet and socialise.

With a growing trend of people working from home, the availability and desire for facilities close to home will increase. Providing these facilities, or provision for these facilities in the future, at the onset of the development stage can add a layer of richness and diversity to a development which will assist in its marketability. Facilities such as childcare centres can also increase the perceived value of a development.

The location of these facilities should utilise main collector roads or busy intersections where possible to maximise their visibility and accessibility. It also allows facilities to co-exist to create a critical mass that can also support small retail outlets. Early consultation with Council staff during the neighbourhood context analysis will assist in determining what community facilities are required in the area, and where there are possible gaps in the market.

Desirable community facilities may include:

- ☐ Local shops such as a dairy, hairdresser, fish and chip shop etc.
- ☐ Medical Centre
- ☐ Marae
- ☐ Churches
- ☐ School(s)
- ☐ Childcare/daycare/kindergarten
- ☐ Libraries
- ☐ Swimming Pools
- ☐ Tennis Courts
- ☐ Basketball courts
- ☐ Parks and open spaces

D

SUBDIVISION DESIGN

D1 Connectivity and Transport Choice

Direct links and multiple connections are key elements of an accessible and resilient neighbourhood. Designing subdivisions to maximise connectivity and provide for transport choice will enhance a development's quality and functionality.

BENEFITS

Reduces reliance on private vehicles and the need for short car trips.

Increases route choice and facilitates ease of walking, cycling and use of public transport.

Encourages more people to walk and cycle.

Enhances opportunities for interaction that can lead to increased safety, vibrancy and success of commercial/mixed use developments.

Connected roads better for water network with less dead ends and less need for drainage through private property.

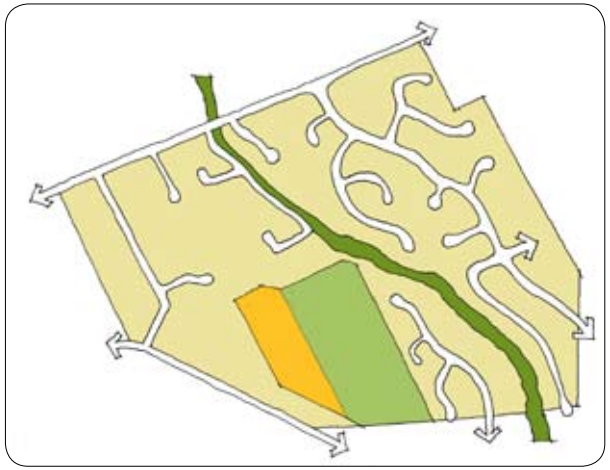
Greater likelihood the Council will support reduced carriageway widths, pockets of higher density housing, and commercial / mixed use development where it is shown a connected transport network will improve the functioning of the local network.

Will achieve design principles: ***Connect, Choice, Reduce, Safe***

The creation of direct connections between roads and pathways exponentially increases the number of route choices available compared to what is possible with a traditional cul-de-sac design (see adjacent figures). Travel times for all forms of transport are also greatly reduced. This is especially important for creating a walkable neighbourhood where it is widely recognised that most pedestrians will walk 400m (approximately a 5 minute walk) for small errands. Street layout over the past 50 years or more has primarily been focused by the geometry of road design for cars, which has had a major influence on how people choose to travel. It has had the effect of encouraging car use, even for short journeys, which would be better made by walking or cycling.

"Good connections enhance choice, support social cohesion, make places lively and safe and facilitate contact among people. Quality urban design recognises how all networks - street, railways, walking and cycling routes, services, infrastructure, and communication networks - connect and support healthy neighbourhoods, towns and cities. Places with good connections between activities and with careful placement of facilities benefit from reduced travel times and lower environmental impacts. Where physical layouts and activity patterns are easily understood, residents and visitors can navigate around the city easily."

New Zealand Urban Design Protocol,
Ministry for the Environment



Typical Cul-de-sac road design with limited connections

A well connected road design

While connectivity was planned and constructed in this example, land ownership issues and private right-of-ways have prevented this walkway being used as was originally planned

Footpaths need to follow desire lines and need to relate to existing facilities such as bus stops. In most cases people will follow the shortest possible route.

This pedestrian/cycle bridge provides a high level of connectivity within a park or reserve, following pedestrian desire lines. It also has good visibility. This is an example of a feature achieving multiple benefits - art, healthy, pedestrian access, low maintenance.

Often with a cul-de-sac design, or with blocks greater than 200m in length, it is not possible to reach anything other than more residential dwellings within a 400m walk. Destinations are typically located over 400m away, reinforcing the need to use the car.

By creating a dense network of roads, typically using a 80-100m grid with variations for topography, waterways, orientation, nodes and destinations, travel distances are greatly reduced. The ability to create mixed use developments is also increased as a greater number of dwellings have direct access to a site. Using traffic calming measures and tighter road radii at intersections and corners, it is possible to create a low speed environment which in turn provides all the benefits that a cul-de-sac design solution may have.

Cul-de-sac Designs

In some instances it will be necessary to use cul-de-sacs due to topography, vegetation or other landscape features which maybe otherwise adversely affected, however their use and length should be minimised.

The following are design elements which should be used as a guide:

- Cul-de-sacs should not be longer than 75m in length and be straight where possible.
- Pedestrian and cycle links should be provided at the end of cul-de-sacs linking to other streets or open space.
- Pedestrian and cycle links should be at least 6m in width and provide a clear line of sight to the other end.

DESIGN QUESTIONS

Has the number of connections been maximised?

Does the design provide a number of transport mode and route options?

Does the design allow for future development on neighbouring properties?

Does the design allow greater connections, and shorter travelling times to shops, bus stops, schools, employment or other amenities?

D2 Street, Block and Site Orientation

The layout of a proposed design has significant potential to influence ease of movement in and around the site, access to sunlight and the quality of natural features. Consideration of these elements in the design of street, block and site orientation will help to maximise the quality of the development and surrounding area.

BENEFITS

The amount of sunlight each lot receives is maximised, allowing future dwellings to benefit from passive solar gain.

By orientating sites to the sun, potential property values are maximised as these are more favoured by home owners.

The 'walkability' of the subdivision is maximised with the ability to take the shortest route possible.

Dwellings on north-south roads can locate outdoor living areas where they get plenty of sun while being away from public roads for privacy.

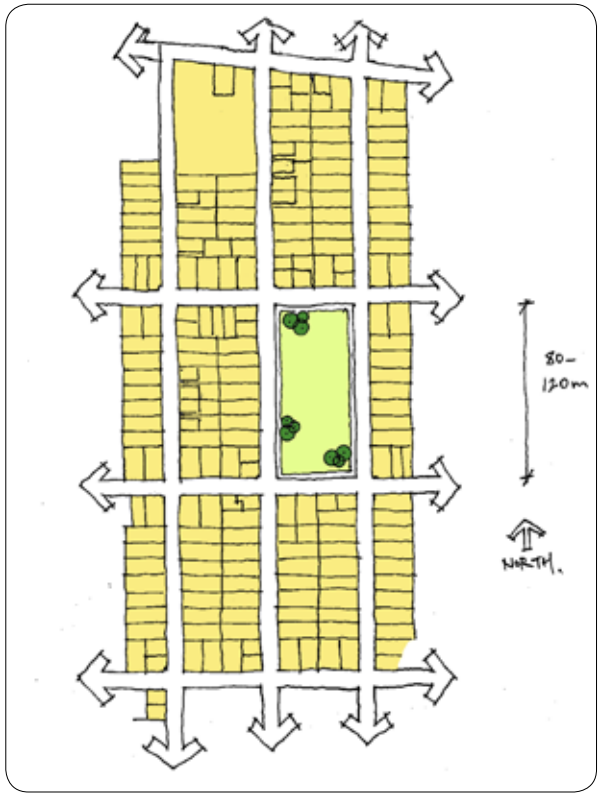
Working with existing natural features, especially topography, minimises earth works and construction costs and may assist with stormwater and wastewater drainage while providing the subdivision with a unique character and feel.

Will achieve design principles: ***Integrate, Retain, Reduce, Respond, Enhance***

Equally as important as connectivity is the orientation of the streets and blocks. A grid spacing of 80-100m provides an optimum network for pedestrian and vehicular needs in most circumstances. At these dimensions it is possible for a pedestrian to walk in a number of different directions for short journeys to reach local amenities, and thereby reducing the number of car trips that need to be taken.

While topography and landscape features such as vegetation and waterways will influence site layout, a key objective should be to maximise north-south orientated roads. This design approach creates east-west orientated allotments that will maximise the amount of sunlight a dwelling will receive.

The figure shows a typical north-south orientated road which maximises the number of properties which receive direct sunlight into their living areas.



The houses along this road face onto the back of the adjoining properties. As well as creating a unbalanced appearance, it creates privacy issues for outdoor living areas and reduces passive surveillance over the roadway.

Extensive earthworks are required to create a suitable flat area for roads and dwellings on some sites. Early planning should investigate ways to reduce cut and fill requirements.

Existing vegetation along the road corridor can be retained to provide a degree of amenity to new developments.

WORKING WITH THE LANDSCAPE

Well designed subdivisions integrate with the existing landscape rather than impose upon it. In most situations the underlying topography plays a major part in the overall design and layout of a subdivision. Working with existing features such as topography, vegetation and waterways adds valuable character and amenity to a newly developed area which can otherwise appear barren and 'raw'. By working with the natural site features, earthworks can be minimised and natural drainage patterns maintained, resulting in reduced construction costs. This reflects key low impact design principles.

Desirable elements for working with the landscape include:

- ☐ Follow existing contours as much as possible to mimimise cut and fill works. In some cases it may be necessary to 'revisit' the design speed of roads to more closely follow a hillside.
- ☐ Minimise earthworks to reduce land disturbance and potential for contaminated runoff leaving the site and affecting adjacent waterways.
- ☐ Integrate existing waterways with recreation spaces as well as walking and cycling networks. This can also increase/retain the ecological value of a design.
- ☐ Incorporate existing vegetation such as significant trees or farm shelter belts as this adds instant amenity and character to a subdivision design.

DESIGN QUESTIONS

Is it possible to create a north-south road orientation?

Is pedestrian and cyclist route choice maximised?

Does the design work with the landscape, retaining significant vegetation and waterways?

D3 Lot Design

Effective design and layout of lots will enhance the quality and functionality of a subdivision. Careful consideration and integration of design elements such as natural site features, streets, open space and lots sizes will contribute to the success of a development project.

BENEFITS

Greater diversity in lot size, layout and house design increases the market potential of a subdivision, appealing to a greater proportion of the community.

Greater diversity in lot design may result in a greater potential 'yield' from the development by allowing for a greater number of properties.

Active frontages to the street and open spaces provides a greater level of passive surveillance and supports community activity

Will achieve design principles: ***Choice, Retain, Reduce, Safe, Enhance***

There are a number of key elements which need to be incorporated into a subdivision design. A key principle to good design is providing a large degree of choice and variety in all facets of the design. By creating greater diversity, a greater percentage of the community (or market) is potentially catered for. Not all people want to own a 4 bedroom, 250m^2 house on a 750m^2 section, nor can they always afford it. The following pages look at a conventional lot design, then re-design it following recognised good urban design principles to achieve an integrated design which is beneficial to the council, the developer and the community.

Terrace housing overlooking a reserve, with good passive surveillance

These terrace houses overlook a reserve and provide an alternative to maintaining a 600m2-700m^2 section.

Semi-detached housing on 300-400m^2 sections which through efficient design maximise the amount of private space at the back. They also provide good passive surveillance over the street.

Smaller front yard requirements for buildings living spaces, such as lounge and dining areas, allow buildings to be designed to provide greater surveillance onto the street.

CONVENTIONAL LOT DESIGN

Over recent decades conventional lot design has resulted in the creation of cul-de-sac developments with a standard lot sizes of 600m^2-700m^2. The designs have little variation in lot size or form and often results in a large number of rear allotments. As well as having poor connectivity, open spaces can become isolated and the backs of sections back on to public space.

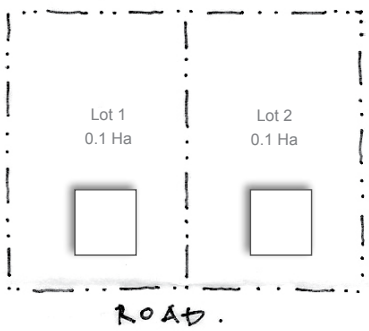
A conventional large scale lot design of the nineties with little variety or connectivity.

(A) The example to the right shows a typical small 'infill' subdivision which occurs frequently in urban areas. In this example two 'quarter acre' sections are subdivided into four 500m^2 sections, creating two rear sections

(B). This results in the fronts of properties facing backs and increasing the number of accessways from two to three or four.

(C) A alternative option is to create four allotments all fronting on to road with car access provided by a single accessway to the side. With the creation of similar subdivisions over time, it will be possible to create a service lane type arrangement at the rear improving the pedestrian environment along the front by minimising crossing points. It also results in fronts facing fronts and backs facing backs.

(A)



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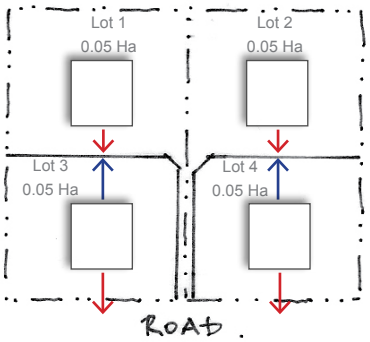
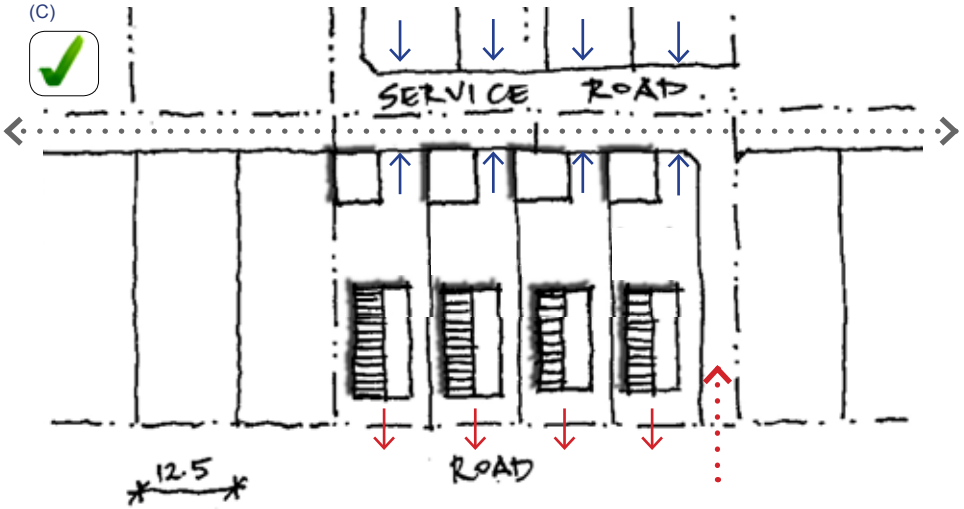


(C)



INTEGRATED LOT DESIGN

The design below shows an integrated approach to lot design with a variety of lot sizes. Open space is a focal point to the design and integrates with stormwater management techniques. The road layout provides good connectivity and is designed to ensure low vehicle speeds. The design also allows for an additional 7 allotments to be created without a major change to the perceived density. The following design elements are considered integral

- ☐ Variety of lot sizes and shapes
- ☐ Walkable block sizes
- ☐ Potential for mixed use development on corner sites
- ☐ Integration of stormwater management and public open space
- ☐ A high level of connectivity combined with streets designed to create a low speed environment using reduced carriageway widths at entry points
- ☐ Carparking and allotments facing onto public spaces to provide good access and a high level of passive surveillance.

A large scale subdivision design following good urban design principles by providing a variety of lot sizes and good connectivity.

Perspective birdseye sketch showing good urban design principles in practice

DESIRABLE DESIGN ELEMENTS

Variety of houses types
- terrace
- semi-detached
- detached

Avoidance of rear lots

3.5m wide accessways

Maximising passive surveillance over the street and open spaces

1 Houses having direct pedestrian access off the street

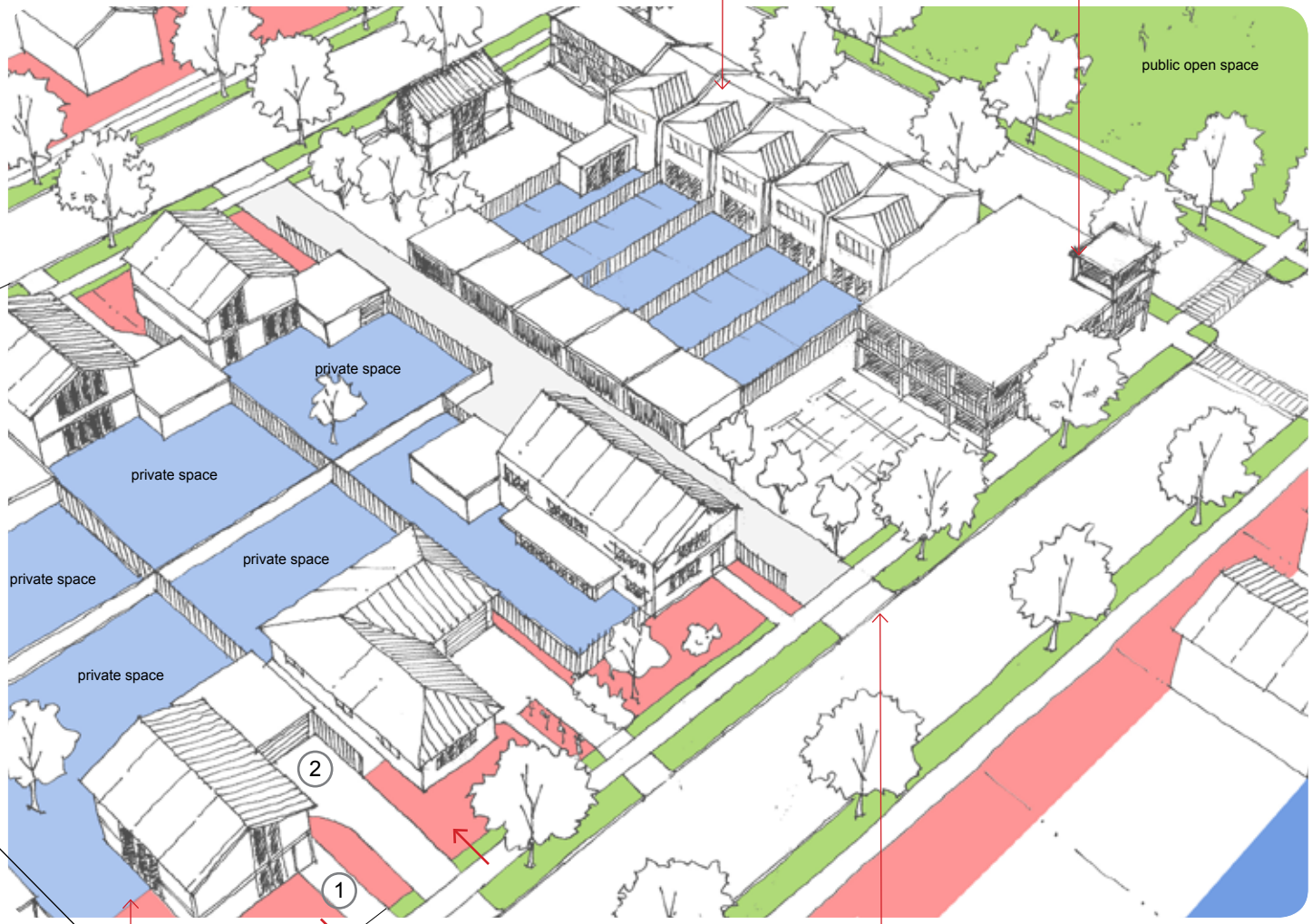
Variation in lot sizes and housing typologies

Maximise solar gain for houses

2 Garages set back from the road, subsurvient to pedestrian access and avoids 'garage-scape'

Medium density terrace housing - lot size of 6m x 35m overlooking the public open space. Orientated north-south to maximise sunlight entering dwelling. Also ensures the block depth does not become too great.

In larger developments and in urban retrofits, mixed use developments on a corner site can create a focus to the subdivision. Being sited on a corner maximises accessibility and passing traffic. Building design should emphasis its corner position with carparking placed at the rear.



backs face backs providing a high degree of privacy for private spaces

60-80m block depth east-west

A rectangular lot shape maximises usable space

Variation in lot size allows for greater variety in house typology as well as meeting the needs of a wider proportion of the community

Maximise outdoor space on the northern side of the dwelling

Fronts facing the street with open or low fences to provide passive surveillance

Service lanes minimise the number of accessways crossing footpaths reducing potential conflict points with pedestrians

ACTIVE FRONTAGES

Active frontages are an important aspect of lot design and layout, both for residential and commercial situations. By placing buildings with windows close to or on the road boundary it creates a positive interaction between the pedestrian environment and the private property. When carparking is placed in front of buildings this 'positive interaction' and a well defined street edge are lost.

RESIDENTIAL PROPERTY FRONTAGES - STREETS AND RESERVES

The layout of a residential area can have a significant impact on crime against property and pedestrians. Open frontages from residential properties onto the street and reserves allow unobstructed sight lines and a greater sense of security for both homeowners and pedestrians. A fundamental premise is that criminals do not wish to be observed. Surveillance or the placing of legitimate 'eyes on the street' increases the perceived risk to offenders.

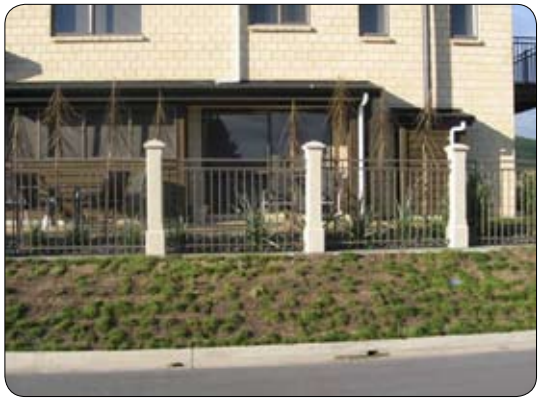
Design criteria for fences along residential, reserve and right-of-way boundaries

FENCE STYLE	MAXIMUM HEIGHT
Open style fence within 3m of the street boundary	1.5m
Solid Fence within 3m of the street boundary	0.7m
Open fence adjacent to a passive recreation reserve	1.2m
Solid fence adjacent to a passive recreation reserve	0.7m
Open fence adjacent to an active recreation reserve / public ROW	1.8m
Solid fence adjacent an active recreation reserve / public ROW	1.2m

The solid 3m fence fronting the road is a poor design solution, limiting connectivity through the neighbourhood and providing no passive surveillance over the road corridor.

An open frontage with windows facing out to the street provides a good level of surveillance over the street. Also the front door opens directly onto the street providing a strong pedestrian connection to street.

Open fencing adjacent to reserves and streets provides good passive surveillance over the public space.



COMMERCIAL PROPERTY FRONTAGES

The location and extent of surface carparking can have a major impact on the character and feel of the streetscape within commercial or small business zones. Large expanses of carparking have occurred as a result of the desire to have visible carparking for customers and create the most cost effective car-park design. Also, designers in the past have tended to focus on fulfilling carparking requirements, often at the expense of good urban design principles.

Unfortunately the creation of carparks has often been at the expense of creating a sense of enclosure, edge definition and overall quality of the public realm. The lack of controls on set backs has resulted in fragmented building lines along road frontages and a lack of a definite edge as well as the inability for buildings to interact with the street environment. In some cases this has been further weakened by the complete demolition of buildings to provide carparking.

The legibility of the street layout improves with zero building setbacks as well as improving the possibility for active edges to the footpath. It is good practice for all on-site carparking to be sited at the rear of the building in those areas closest to the core of the Hastings CBD, allowing for active street frontages to be developed. A maximum required set-back distance would ensure developers site their buildings to meet the street frontage.

The adjacent examples show how the legibility of the street layout is weakened by the placement of carparking on this corner site.

A well designed building on a corner site has the potential to create a landmark in the town/city. Corner sites, due to their higher visibility and connectivity, have good potential for commercial or mixed use development.

DESIGN QUESTIONS

Have a variety of lot sizes been created to maximise the 'marketability' of the development to a wider proportion of the community?

Do 'fronts of the property face fronts' and 'backs of the property face backs' to maintain privacy?

Have active street frontages been incorporated into the design, both for residential and commercial properties?

Has the impact of carparking and accessways on the pedestrian environment been minimised?

Has the potential for mixed use development been investigated?

D4 Open Space Design

The placement, type and integration of public open spaces within a design are probably one of the most important elements to the long term success of a development.

BENEFITS

Well designed open spaces in prominent locations with a high level of amenity and appropriate facilities have the potential to increase the value of the subdivision, and the quality of place.

Will achieve design principles: ***Integrate, Retain, Safe, Respond, Enhance***

Well designed and located parks and public open spaces can add a high level of amenity and value to a development. Open space should not be thought of as 'left-over' space but as an opportunity to enhance the character of a site. Often the best designed spaces are those which integrate well with the local landscape and have a high degree of accessibility for the local community, over time becoming a focal point. They should provide a high degree of choice and flexibility of both passive and active activities for users, while reflecting the needs of the local community.

The following desirable elements are common to good open space design:

- ☐ The open space is connected to a larger network of open spaces and corridors, being located within walking distance of its main users.
- ☐ Good pedestrian / cycle links through the space to connect areas and increase surveillance and safety.
- ☐ Installation of play equipment and facilities which meet the needs of all age groups of the local community.
- ☐ Good links with nearby schools, childcare facilities, retirement homes, medical facilities and commercial areas.
- ☐ Recognise and enhance ecological and hydrological values of the space.
- ☐ Good surveillance from adjoining land uses, i.e. open fences on road boundaries. The use of back sections should be avoided where possible.
- ☐ Take into account ongoing maintenance costs
- ☐ Landscape planting and use of materials which reflect the purpose of the reserve

Solid fencing surrounding the reserve provides a low level of ground floor surveillance. As a result the space gives the appearance of a 'no-man's land' of little value or worth

Good open spaces provide a high level of facilities for all ages groups

This example shows how an integrated approach has been adopted for the design of open space. High levels of passive surveillance is provided by properties overlooking the reserves while the properties benefit from increased amenity looking out over an open space which will never be built out. Stormwater detention basins have been incorporated into the design, again providing a high level of amenity when implemented with native planting.

This example highlights a good relationship between the street and the adjoining reserve with overlooking houses providing casual surveillance. The reserve edge is free of fences and has low shrubs allowing clean sightlines.

Good passive surveillance is available from the reserve and from adjacent residential dwellings.

DESIGN QUESTIONS

Has an integrated approach been taken to the design of open space?

Does the open space add value to the development and surrounding area?

Has a variety of open spaces been included?

Is adequate open space provided for future residents?

What facilities should be provided to meet the needs of the community?

Has the cost of long term maintenance been considered?

D5 Stormwater Management

Stormwater solutions incorporating natural features offer opportunities to add value to developments, enhance local amenity and ecology and provide key infrastructure services.

BENEFITS

Reduced reliance on major reticulated infrastructure systems.

Provide the ability to treat stormwater close to its source and meet water quality and quantity objectives.

Low Impact Design principles and treatment techniques align with natural hydrological processes and ecological systems.

Low Impact Design stormwater solutions can become landscape features in their own right when designed and integrated with native/amenity plantings.

Will achieve design principles: ***Integrate, Retain, Reduce, Respond, Enhance***

Low Impact Design principles that recognise local features and treatment practices that utilise natural processes to manage flooding and pollution can compliment traditional approaches to stormwater management and enhance local values. Low Impact Design promotes at source treatment of stormwater runoff and offers the potential to reduce infrastructure costs and achieve multiple design objectives in a new or redevelopment project. It typically involves infiltration of stormwater via swales, raingardens and tree pits.

Site characteristics and design objectives will influence the level to which Low Impact Design principles and treatment techniques can be applied to the development, and should be a key consideration at the subdivision planning phase of the project.
Desirable elements of low impact design principles and treatment practices include:

- ☐ Use of porous / pervious surfaces
- ☐ Rain gardens
- ☐ Swales
- ☐ Rain tanks
- ☐ Tree pits and planter boxes

The above example shows how an historic waterway has been daylighted as a design feature in an urban location with native planting providing an important filtering function

Breaks in the kerb allow stormwater to discharge into rain gardens reducing water requirements for plant beds as well as treating and reducing peak flows entering stormwater infrastructure.

Design for maintenance and to minimise whole of life costs

Maintenance of devices must be considered early in the design process. This will assist in the identification of features that will facilitate the ease and efficiency of ongoing operation and maintenance of stormwater management devices. The main elements to consider in designing maintenance smart systems are (adapted from EPA Victoria, 2008):

- Access – All components must be easily accessible by maintenance staff.
- Vegetation – Selection of vegetation must be appropriate to local conditions, planting designs must provide safe environments and facilitate ease of maintenance and additional maintenance is often required during vegetation establishment.
- Mulch – Ensuring stormwater runoff doesn't wash mulch into drains and cause blockages can be addressed by good device design and selection of a mulch material that doesn't float e.g. river stones.
- Sediment – Identify methods for removing and disposing of sediments from devices and designing areas for stockpiling and drying material to reduce the complexity and cost of maintenance.
- Mechanical components – Components should be simple and robust to ensure durability and ease of maintenance. A consistent approach to the diversity and nature of mechanical components across a management area will reduce the complexity and cost of ongoing maintenance.
- Vandalism & safety – Identifying appropriate locations for devices, selecting vegetation and materials that allow for surveillance and providing appropriate support structures such as tree guards can reduce the potential for vandalism and contribute to safe public spaces.
- Community – Engaging the community or new landowners to raise awareness about the purpose and function of stormwater management devices and to gain an understanding of their expectations and willingness to contribute to the on-going maintenance of these devices can lead to wider acceptance of changing practice. Raising environmental awareness and/or marketing the subdivision as 'eco friendly' is an option as is devolving maintenance of berms, mowing, removal of litter to adjoining property owners who "buy into" the eco subdivision concept.

Kerb and channel has been replaced with a riverstone swale and concrete edges

Both of these examples show how natural water flows have been incorporated into the overall design to provide a high degree of amenity. In the above example, a detention basin has been designed taking into account the original topography to minimise earthworks and allowing for the retention of existing vegetation. This provides the playground with an excellent outlook. Also note the low height and open style fencing. This is a win-win for park users who feel safer and adjoining residents who enjoy the open space and reserve outlook.

DESIGN QUESTIONS

Has the extent of land disturbance and impervious area been minimised as far as practical?

Have Low Impact Design principles and treatment techniques been considered and incorporated in the design where appropriate?

Can other on-site techniques to reduce stormwater runoff be included in the design?

Have existing streams or drains been incorporated and enhanced with the design?

Are there downstream capacity constraints that require on-site or in-development measures?

How is drainage design integrated with road design and levels to provide storage or secondary flow during extreme events?

Can Low Impact Design treatment practices be integrated with site landscaping and designed to create an attractive environment. Have whole life values been incorporated?

Have you considered the 2009 HBRC Waterway Design Guidelines - Low Impact Design, Industrial Stormwater Design, Stormwater Management, Small Dam Design

E

STREET DESIGN

E1 Street Design and Road Hierarchy

Street design is about much more than just providing good roads for vehicles - it is also about creating quality places, livable neighbourhoods and sustainable communities. Considering the range of functions a street provides, the design stage of development maximises the potential to create great streets that function well and contribute to quality of life.

BENEFITS

Street design, when combined with connectivity, creates a variety of routes and transport options in a city / town.

The design speed reflects the local environment by reducing speeds where appropriate on local roads while allowing efficient traffic flows on collector and arterial roads.

Narrower carriageways and slow traffic speeds increase pedestrian and cycle activity.

More efficient use of land by using a variety of road reserve widths, reflecting the surrounding landuse.

Streets can significantly enhance quality of life through good design, by considering street function in terms of both facilitating movement and creating place.

Will achieve design principles: ***Choice, Connect, Integrate, Reduce, Respond, Safe, Deliver***

There is considerable pressure on space within the road reserve and the basic functions which need to be catered for in the design of a road. Elements include the carriageway, berms, landscaping, parking zones, cycleways, footpaths - all of which compete for space to varying degrees depending on the status and purpose of the road. Most local roads do not require all of these elements and most of these share 'space'. What is key to subdivision and infrastructure design is how these elements are combined as they all will determine the character of a neighbourhood and influence local context.

Key design elements are:

- ☐ **Quality** – the quality and space provided for elements in the road design, other than vehicle movements, will add to the amenity and character of the neighbourhood.
- ☐ **Sufficient Space** – ensure that sufficient space is provided for the road's purpose and future uses.
- ☐ **Road Width** – the width of the road should reflect the status of the road and the number of vehicles, cyclists and pedestrians it is likely to carry. It is not a case of one size fits all.
- ☐ **Sight Lines** – ensure the design maintains good sight lines for drivers, cyclists and pedestrians, especially at intersections, driveways, desire lines and crossing points.
- ☐ **Low Volume Roads** – With low vehicle numbers, greater sharing of the road corridor can occur. Traffic calming measures should be included to bring vehicle speeds down to those suitable for residential areas where there are potentially a lot of walkers and cyclists.
- ☐ **High Volume Roads** – With increasing numbers of vehicles, competing uses should become more segregated. Cycle lanes should be installed and safe crossing points with refuges provided for pedestrians, especially around key nodes or destination points.

For the purposes of this guide, road hierarchy has been divided into three categories being Arterial Roads, Collector Roads and Local Roads, with local road being further divided into residential roads, minor residential streets and residential lanes. Most subdivisions will be primarily focused on the design of local roads, but some larger developments may include Arterial and Collector Roads. In all instances, early consultation with Council staff is key to developing an appropriate design as it is the Council who will take over the long term maintenance and upkeep of all roads (with the exception of private accessways). It is critical that Council standards and design objectives are met.

Arterial Roads

Arterial roads carry considerable numbers of vehicles, cyclists and pedestrians each day and this is their primary function. Often these roads may have higher speed limits, creating a greater need to segregate different transport modes. At speeds ≥ 70kmph, cycle lanes should be moved off-road if possible to minimise potential conflicts with vehicles. Other design options can also be investigated including slip lanes, service lanes and dedicated bus lanes.

Desirable elements of arterial roads include:

- ☐ Segregated transport modes
- ☐ Provision of bus lanes
- ☐ Tight intersections should be designed along with regular crossing points for safe pedestrian movement
- ☐ Cycle lanes

Current Image of Havelock Road

After Image of Havelock Road - Possible opportunity to develop a bus lane, planted median and a separate shared cycle/walking facility (to the left of the photo).

E2 Collector Roads

Collector Roads

Collector roads are typically those which carry moderate numbers of both local and through traffic and tend to have adjoining landuses, such as schools, small commercial centres and major parks which generate traffic. They link to the arterial network and often form spines to the local network.

Desirable elements of collector roads are:

- ☐ A carriageway wide enough to allow oncoming vehicles to pass without having to yield or slow.
- ☐ Separate 2.0m (minimum 1.5m for a 50kmph zone) cycle lanes
- ☐ In residential areas, footpaths on both sides of the road separated from traffic by a minimum 2m grassed / landscape berm
- ☐ Provision of seating/rest facilities, secure covered cycle storage in commercial areas
- ☐ Provision for public transport / routes
- ☐ Street trees

The plans on the next two pages highlight possible layout options for a typical collector road and the elements that may need to be incorporated.

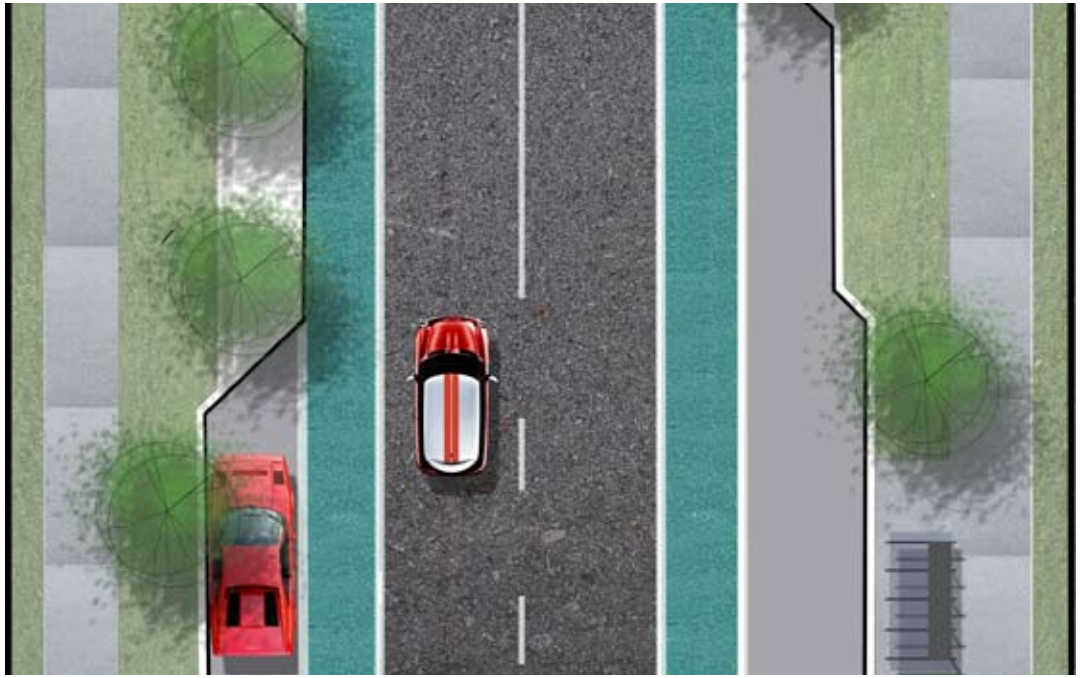
Existing collector Road - Sylvan Road, Hastings

Collector Road
(On road cycle facilities)

The section and plan show a collector road with on-road cycle lanes, public transport provision and low impact urban design practices for stormwater management and landscape amenity.

Note: Cycle lanes not required or necessary in low speed commercial areas

Varies in width - service strip | 1.5m (residential) footpath | 2.0m minimum landscape /rain garden zone | 2.0m or 2.5m parking zone | 2.0m cycle lane | 3.5m carriageway | 3.5m carriageway | 2.0m cycle lane | 3.0m bus stop / 2.2m parking zone | 2.0m minimum furniture / landscape/ rain garden zone | 3.0m (Commercial) Footpath | Frontage



Collector Road
(Off road cycle facilities)

The section and plan show a collector road with separate off road cycle way, public transport provision and low impact urban design practices for stormwater management and landscape amenity.

1.5m (residential) footpath | 3.5m off road cycle lane | 2.0m minimum landscape / rain garden zone | 2.0m or 2.5m park-ing zone | 3.5m carriageway | 3.5m carriageway | 3.0m bus stop / 2.2m parking zone | 2.0m minimum furniture / landscape /rain garden zone | 3.0m (commercial) footpath | Frontage

E3 Local Roads

Local roads make up the majority of roads and streets in cities/towns and are designed to serve local dwellings and not to act as a through route for high volumes of traffic. Often these roads carry a low number of vehicles creating an environment where it is possible to have shared facilities.

Desirable elements of local roads are:

- ☐ A street design which encourages slower traffic speeds.
- ☐ Shared facilities.
- ☐ A high quality walking and cycling environment.
- ☐ Landscaping including street trees and pocket play areas.

In the past it has been fashionable to create 'cul-de-sac' streets which physically prevent through traffic using a local road. While cul-de-sacs have some advantages, they have disadvantages in terms of their lack of connectivity, often resulting in greater travel times as well as being primarily focused with car movements. This is especially so when the length of a cul-de-sac exceeds distances over 75m. They also require a greater land area to provide effective turning circles. Howver, cul-de-sacs do have some benefits which can still be achieved using a connected road design if a low speed environment is achieved. The table below highlights three possible local road types that are designed to serve a particular number of dwelling units and traffic volumes.

LOCAL ROAD TYPE	DWELLINGS SERVED
Residential Lane	Less than or equal to 10
Minor Residential Street	Less than or equal to 20
Residential Road	Less than or equal to 200

Above is a typical example of a local road with a variable carriageway. A 2m landscape berm on each side provides plenty of room for tree planting and amenity. Mountable kerbs provide long term flexibility for future changes in adjoining land use as well as visually softening the road edge.

The example above shows a flush kerb which allows stormwater to runoff into the adjacent swale / rain garden system. The flush kerb provides a visually pleasant edge detail.

a. RESIDENTIAL ROAD

The section and plan to the right show a typical 7.6m carriageway which is common for many local roads. The road is designed to cater up to 200 dwelling units, carrying less than 2000 vehicle movements a day, with a minimum width of 15m.

Parking is provided on one side (1 x 2.1m) with a 5.5m movement lane (carriageway). A 5.5m movement lane allows two vehicles to pass, but at slow speeds.

A minimum two metre landscape berm with street trees is provided between the road and the footpath to provide a physical buffer for pedestrians from vehicles. There is also provision for local underground services.

Two footpaths are generally provided although only one is needed for streets less than 100m in length.

The carriageway could be reduced at intersections and at other points to reduce travel speeds. Variation in alignment would also create a more interesting environment for pedestrians. Consideration will be given to a reduced movement lane to provide for innovative road design, further greening of the street and/ or a reduction in vehicle speeds. Consideration should be given to the use of mountable or flush kerbs (refer to P45).

This example of flush kerbs along the central median allows the stormwater swale to be a design feature.

Varies in width - service strip | 1.5m Footpath | 2.0m minimum landscape / rain garden zone | 2.1m parking zone | 5.5m carriageway | 2.0m minimum furniture / landscape /rain garden zone | 1.5m Footpath | Varies in width - service strip

15.0m minimum Road Reserve width

b. MINOR RESIDENTIAL STREET

The sections and plans to the right show 12m and 15m wide road reserves with a 5.5m carriageway. A 5.5m clearway allows two vehicles to pass, but at slow speeds. The roads are designed to cater for up to or equal to 20 dwelling units, carrying less than 200 vehicle movements a day.

12m Road Reserve
A 5.5m movement lane (carriageway) allows two vehicles to pass, but at slow speeds. Parking is possible on one side but parking bays are not provided. A footpath is provided on one side only.

15m Road Reserve
Parking is provided on one side (1 x 2.1m) with a 5.5m clearway.

A two metre landscape berm with street trees is provided between the road and the footpath to provide a physical buffer for pedestrians from vehicles to provide a pleasant street environment. Where more than 3.5m is available there is an opportunity to create a swale.

The carriageway could be reduced at intersections and at other points to reduce travel speeds. Variation in alignment would also create a more interesting environment for pedestrians. Consideration will be given to a reduced movement lane to provide for innovative road design, further greening of the street and/ or a reduction in vehicle speeds. Consideration should be given to the use of mountable or flush kerbs (refer to P45).

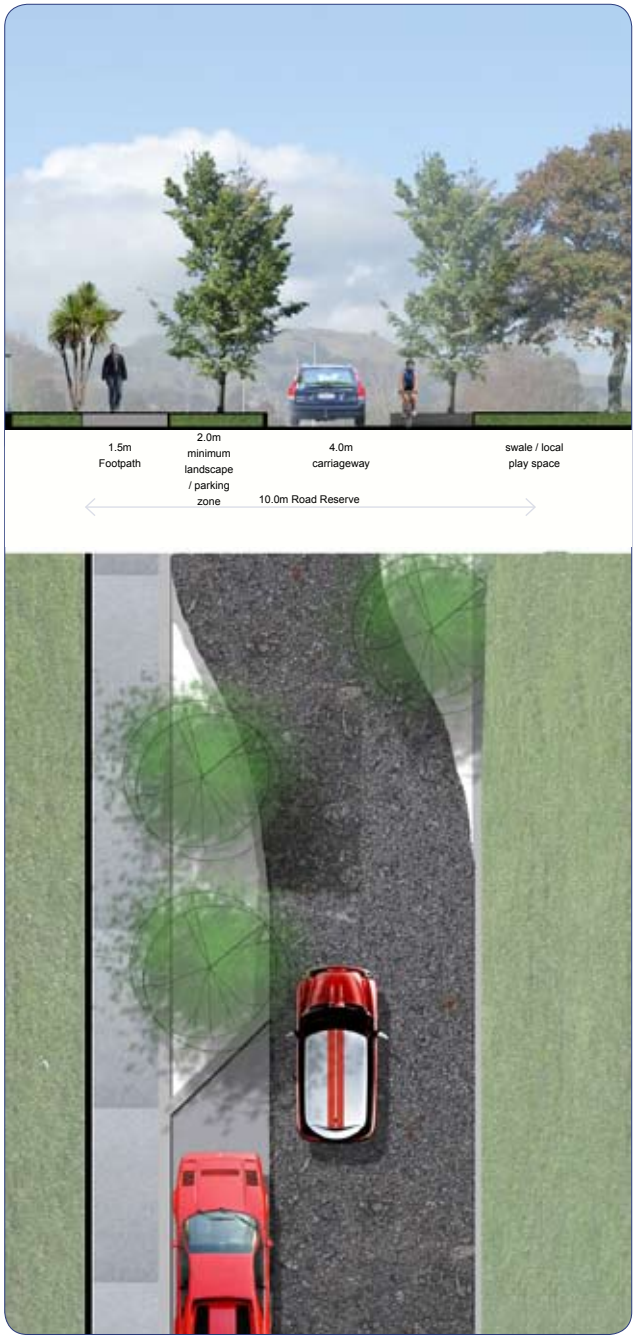
1. 12m Road Reserve

2. 15m Road Reserve

c. RESIDENTIAL LANE

The section and plan to the right show a low speed residential lane which occupies a 10m road reserve. The carriageway is 4.0m wide with parking bays located alternatively along its length. 1.5m footpath is provided on one side with a services strip on the opposite side. Further reductions in the movement lane (carriageway) will be considered at intervals where appropriate to reduce traffic speed, enhance amenity or provide for innovative design. Opportunities are available to integrate lanes with local play areas or pocket parks.

This lane style road is a good example for connecting roads that would have otherwise been cul-de-sacs. It is recommended that it is only used for relatively short distances, 50-100m, where it is possible to have a clear line of sight along its length.
Reduced minimum front yard requirements for dwellings (but not garages) should be allowed. Consideration should be given to the use of mountable or flush kerbs (refer to P45).

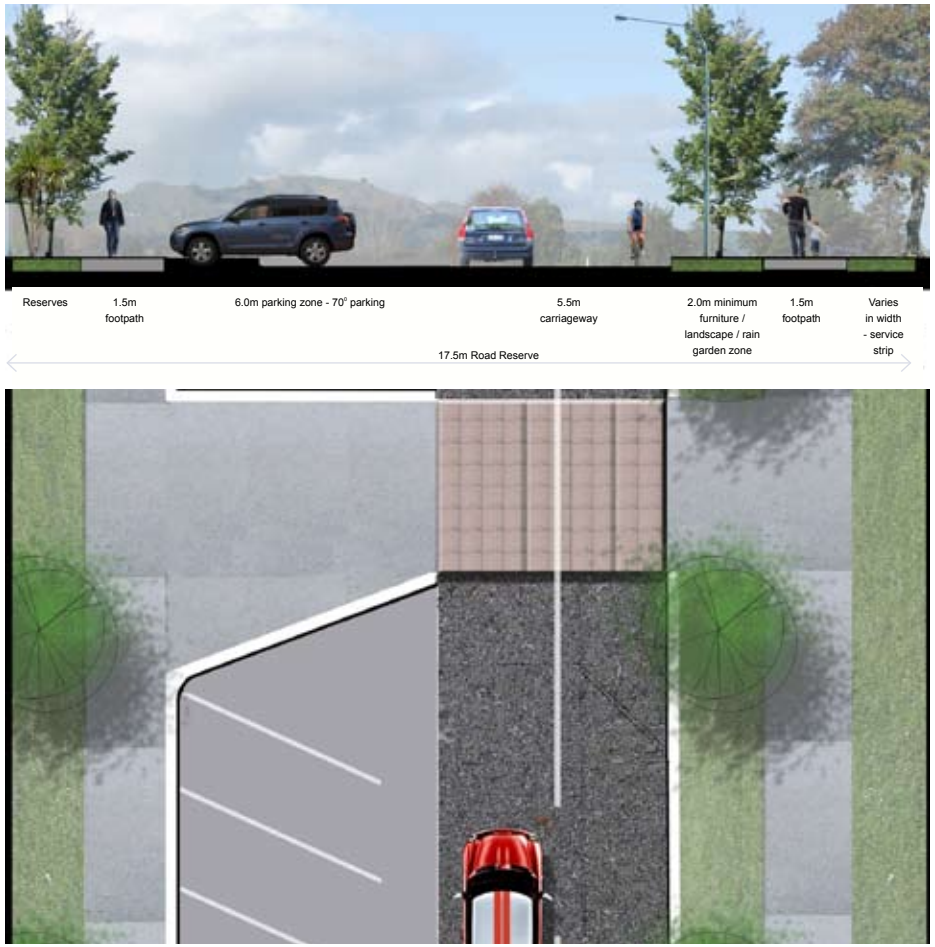


The road provides a 'short cut' between a cul-de-sac and a local road. The narrow carriageway and segregated parking creates a low speed environment detering cars racing through the area. Open front yards of dwellings located closer to the street gives the road a high level of ownership by adjoining residents

d. LOCAL ROADS ADJACENT TO OPEN SPACE / RESERVES

The section and plan to the right shows how parking can be provided adjacent to open spaces and reserves. This increases accessibility to and surveillance over the space while also providing necessary parking when events are on. By placing parking on the edge of the space it maximises its usefulness while minimising the amount of access roads and paving required in the park.
The use of alternative pavers for the parking area also breaks up the "grey top" of the road and provides demarkation and increased amenity. Pavers could also be semi permeable, reducing stormwater runoff.

The photo shows a good example of carparking being provided on the edge of an open space. Note the dish channel providing a demarcation line between the carriageway and the parking area.



DESIGN QUESTIONS

Does the road design support its function and purpose?

Have Council staff been consulted to ensure the road design 'fits' with the surrounding road network?

Does the road design reflect the surrounding land uses?

Does the design use land efficiently and provide for public transport use (on arterial and collector roads)?

Are pedestrians and cyclists adequately catered for?

E4 Woonerf / Home Zones / Shared Streets

BENEFITS

Shared Streets, if designed well, can create highly useable public space which can be enjoyed by all members of the community.

Will achieve design principles: ***Connect, Reduce, Safe, Deliver***

The concept of Woonerf or Shared Streets was developed in the Netherlands where pedestrians and cyclists have priority over motorists. In 1999 the Netherlands had over 6000 Woonerven (ref: Wikipedia). Vehicle speeds are restricted to walking pace or very low speeds, encouraging the use of the entire street by pedestrians and where children can play safely in the street.

The concept has been further developed in the United Kingdom where the term 'Home Zone' is used. A residential street or group of streets are designed primarily to meet the interests of the local community, whether they are on foot, cycling or in cars and allows the street to be used as a social gathering space. Encouraging children's play is an important component of many home zone designs.

There are a number of desirable elements to planning a successful Shared Street

- ☐ The process of designing the home zone with the participation of local people in itself strengthens the community.
- ☐ A Shared Street needs to be legally designated and signed at entrances and exits.
- ☐ Involve the use of shared surfaces where there is no or little demarcation between pedestrian and traffic areas - there is no exclusivity of space for vehicles.
- ☐ Street furnitures such as benches, tables and play equipment to encourage social interaction
- ☐ Street trees and areas of planting, ideally maintained by residents.
- ☐ Clustered on-street parking forms part of the layout.
- ☐ Traffic speeds are kept low (typically around 20kmph) by utilising design features such as sharp changes of direction for traffic and narrowings where only one motor vehicle can pass at a time.

✓ This photo is a good example of a short street with shared space. Note the lack of kerbs and the tight radius entering into the street.

KEY DESIGN ELEMENTS

- Shared space with greater priority given to pedestrians and cyclists
- Car access and movements designed to slow vehicle speeds - few signs and limited demarcation between spaces
- Discourages through traffic
- Provides community open spaces and pavements with minimal vehicle conflict - no kerb and channel
- Greater opportunity to use permeable materials and low impact design techniques
- A typical woonerf becomes a multi purpose community reserve as opposed to simply moving traffic
- Consultation with the local residents and communities is needed at the beginning of the design process for a shared space to ensure success
- Encourages walking, cycling and congregating
- Distinguished from other streets by having signed entry and exit points

The examples above show shared streets which double as a play areas for local children.
(http://www.courtyardhousing.org/images_shared.html)

E5 Traffic Calming

Managing traffic speed and volumes is fundamental to creating safe and inviting places for residents, pedestrians and cyclists. Incorporating traffic calming measures in the design of developments provides opportunities to effectively manage traffic and deliver a quality place.

BENEFITS

The design speed reflects the local environment reducing speeds where appropriate on local roads while allowing efficient and flow traffic flows on collector and arterial roads.

Increased pedestrian and cycle activity

Road design when combined with connectivity creates a variety of routes and transport options in a city / town.

More efficient use of land by using a variety of road reserve widths, reflecting the surrounding landuse.

Will achieve design principles: ***Choice, Integrate, Retain, Reduce, Connect, Safe, Respond, Enhance, Deliver***

Case studies have shown that, at slower vehicle speeds, drivers are more likely to allow pedestrians to cross, while at higher speeds drivers are less likely to 'yield'. There maybe opportunities to introduce Low Impact Design techniques (See E13) to function as traffic calming features and stormwater management solutions. This achieves multiple sustainable design outcomes.

The following outlines a number of methods to providing traffic calming measures to a street:

- Road Narrowing - This can be achieved by a number of methods and is probably the most effective method as it creates side friction for moving vehicles. Whether it is achieved through narrower carriageways, kerb protrusions, tree planting, parked vehicles (on-street), or a combination of all, it is a successful and proven technique. This is further enhanced by changes in material such as for parking bays, placement of a dish channel on the edge of the active carriageway or, for more major roads, marking of cycle lanes.
- Shifting the alignment / Chicanes - In a city such as Hastings with a strong street grid layout, long straight residential roads are common. Shifting the alignment of the carriageway within the road reserve assists with 'breaking up' the length of the road.
- Medians and Traffic islands / refuges - These assist with providing side friction to moving vehicles and giving drivers a sense of enclosure. Medians can be used for landscaping or as pedestrian refuges assisting with reducing travel distances.
- Intersection radii - tightening corners and not providing slip lanes to reduce vehicle speed.
- Raised intersections, speed humps, textured surfaces - are all vertical measures used to discourage travelling over the hump or surface as the change in level causes driver discomfort at high speeds. Speed humps are the least desirable of these options.

Above is a good example of traffic calming using kerb protrusions,paving and tree planting to reduce both the actual and perceived width of the carriageway. The paved surface is raised to cause discomfort for drivers travelling at higher speeds and the long straight nature of the road is broken by a shift in the carriageway alignment. In this example, the road narrowing is adjacent to a park entrance with the crosing distance for pedestrians being reduced.

This photo is neither a good or bad example. It does however, highlight the need to observe how people use a space. In this example there an opportunity to improis ve the pedestrian environment by creating a shared street environment adjacent to the river (to the right of the photo). The edge of the river is where most pedestrians would prefer to walk but have to enter the domain of the car.

Central median to change the road alignment

Speed hump to slow traffic entering a low speed environment

Realignment of a long straight carriageway and raised, paved intersection

A combination of a change in materials (paving), road deviation, landscaping and a slight vertical change all combine to slow vehicle speeds and provide a great pedestrian environment. The distance for pedestrians to cross the road is minimised, both in terms of time spend in the active carriagetay and due to the crossing points corresponding to pedestrian desire lines.

DESIGN QUESTIONS

Is traffic speed an existing issue?

Can traffic calming techniques be implemented to reduce potential conflict and increase safety levels for pedestrians and cyclists?

Have Council staff been consulted on possible traffic calming proposals?

Are there opportunities to implement Low Impact Design practices?

Can traffic calming be implemented to improve pedestrian movements by allowing pedestrians to follow desire lines?

E6 The Pedestrian Environment

Walking is the most sustainable of all transport options and every journey includes walking. A 'walkable' community for 50,000 people would cost the same as 1km of motorway and reaches a much wider portion of the population. At present 10% of households do not have access to a car and the population is ageing.

Minor changes to the physical environment can effect major changes in human behaviour and the perceived walkability of an environment. In recent years there has been a rapid decline in the number of trips taken by foot. Whether this is a direct result of the pedestrian environment or of modern lifestyles is of some debate. However, it is proven that creating inviting, well-linked and safe environments promotes walking.

There is a view that there is a need to remove the perception that pedestrians are vulnerable road users by providing better quality facilities and a traffic calmed street environment.

Pedestrian Connectivity

Providing safe and functional pedestrian facilities while minimising travel time for pedestrians through good connectivity and route choice maximises the usefulness and ease for pedestrians to move freely through urban areas. The perceived ease of movement also assists in replacing the use of car trips for shorter journeys with walking/cycling.

The section above shows the zones that are common in most urban footpaths. The widths available for each zone vary dependant upon likely pedestrian demands but it is important that the minimum through route is maintained unobstructed. This cross-section also highlights the competition for space which often occurs from competing uses.

Before and After: Possible development of a shared cycle/walkway on Havelock Road above the Strawberry drain

Before Image

After Image - Photomontage

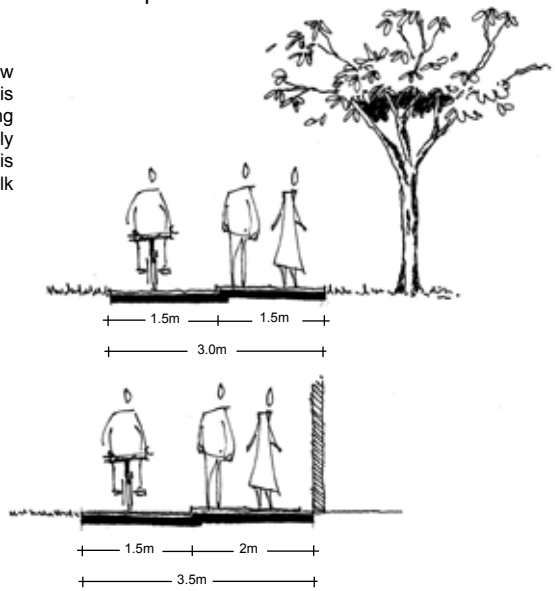
Diversity

Vitality and diversity are key attributes to providing an interesting place to live, work and visit. Footpaths not only provide through routes but are often used as gathering spaces such as in front of schools, or as places to sit and watch the day go by, like cafes and restaurants. In commercial areas it may be more appropriate to use parking spaces for pedestrian areas to provide greater area for people to congregate or walk. All these aspects are important to the success and functioning of an urban area and should be retained or encouraged where possible. It is a matter, however, of ensuring that there is sufficient pedestrian through route for the likely pedestrian numbers as well as sufficient furniture or frontage zones.

Commercial frontages

Competing demands for space are common within commercial street frontages. On a commercial frontage footpath there are competing demands for space between the businesses that front onto the street, wishing to display signs or outdoor seating and tables, and pedestrians passing along the street or using the footpath for social activities. Similarly, people waiting for buses, queuing for cash machines, or crossing the road, can hinder movement along the footpath. Particular conflicts may arise between those on foot and those with strollers, or wheelchairs. As such sufficient space for pedestrians should be provided in commercial areas.

The diagram to the right shows how the width of the footpath required is partially dependent on the adjoining landuse. If the footpath immediately adjoins a solid wall an extra 0.5m is required to allow two people to walk side by side comfortably.



The through route is cluttered with tables, signs, poles and rubbish bins restricting pedestrian movement and providing a number of obstacles for people with mobility impairments.

The above example shows sufficient pedestrian space has been provided for adjoining landuses to 'spill' out onto the street creating a great environment for the community to meet. Note the loss of parking from the upgrade may increase foot traffic.

E7 On Road Car Parking

The design of spaces for on-street car parking must consider both functional use and streetscape amenity.

BENEFITS

A well designed road reserve reduces the amount of land required while ensuring the functional requirements of the street are maintained.

On street car parking provides for visitors and deliveries as well as assisting with traffic calming by providing side friction to moving vehciles.

The use of parking bays reduces the cost of road construction and maintenance and the area of "grey top" providing greater street amenity.

Will achieve design principles: ***Safe, Reduce***

The District Plan requires off-street parking to be provided for every dwelling. There is also some demand for onstreet parking for visitors and short term parking. In residential areas there is less need to provide for onstreet parking. Onstreet parking is more important around shopping centres and community facilities such as schools and churches. As well as serving an important functional use, on-street carparking should also be provided in a manner that maintains and/or enhances the amenity of the street. It also serves to slow vehicle speeds by narrowing the carriageway. This narrowing is particularly effective as the height of parked cars and the irregular edge created by the parked cars provides a degree of enclosure to moving vehicles. On low volume streets, provision for on-street parking may not require additional 'lane' or added road width.

Key design elements include:

- ☐ Parallel kerbside parking distributed throughout the subdivision or neighbourhood provides for resident and visitor parking as well as providing some traffic calming.
- ☐ The use of different materials for parking bays that contrast with traffic lanes make the streetscape more appealing while also reducing vehicle speeds. In lower volume streets the use of parking on reinforced berm is encouraged.
- ☐ Driveways crossing parking bays should be avoided as this renders the bay redundant and obstructs visibility.
- ☐ Consider any facilities or types of land use that may have a higher carparking demand at different times.
- ☐ Ensure that there is sufficient room for street trees to grow without damaging the infrastructure.

This is a good example of on street parking which is separated from the main carriageway by a dish channel and highlighted by a change in the surface finish. Trees are also located within the parking zone helping to reduce the perceived width of the four lane road.

DESIGN QUESTIONS

Can sufficient on-street car parking be provided?

Can carparking be designed in a manner where the overall perceived width of the carriageway is minimised to provide a degree of traffic calming?

Can tree planting be incorporated into the parking zone (refer to E11)?

Have drainage patterns been addressed to ensure people getting out of their cars are not standing in water?

E8 Bus Stops

BENEFITS

Whether retrofitting into an existing street, or as part of a new development, ensuring enough space is available for public transport on arterial and collector roads improves the overall design and the likelihood of residents using public transport.

Will achieve design principles: ***Connect***

Bus stops and shelters are an important destination or congregation point in a street. However, often their placement is as a retrofit into an existing street and, unless a major upgrade of the street is being undertaken, sometimes little consideration is given to the existing pedestrian environment. In some cases, the placement of bus shelters can have a marked effect on the functions of the footpath by reducing its functional width and making it particularly difficult for prams and wheelchair users.

In an ideal situation sufficient space will be provided for bus stops, both in the furniture zone and the parking zone.

With the placement of bus stops it is important that sufficient space is maintained for pedestrians. In this example the useable footpath between the bus stop and the kerb has become too narrow, causing potential conflict between passengers, both boarding and disembarking, and pedestrians.

This is a good example of placement of the bus shelter as it maintains a clear pedestrian through route and minimises potential conflict between passengers and pedestrians. The bus shelter also provides shelter from sun, wind and rain. The use of a chain around the edges is questionable though as it creates a potential hazard for visually impaired pedestrians or at night.

DESIGN QUESTIONS

Has the potential for well located bus stops been incorporated into the design?

Does the design minimise any potential conflict between waiting passengers, disembarking passengers and through walkers?

Is there sufficient space available for the bus stop or are changes to the kerb line required?

E9 Vehicle Access and Driveways

Smart design can provide clear indications of vehicle accessways and safe interfaces between all street users. Careful attention to these interfaces can contribute to a quality street environment that is both functional and enjoyable to use.

BENEFITS

Providing clear and consistent detailing of accessways improves the walkability of a neighbourhood by reducing potential conflict points with moving vehicles.

Will achieve design principles: ***Safe, Connect, Deliver***

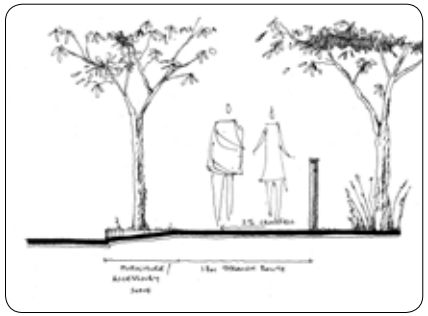
The detailing and surface treatment of accessways and entrances is very important in highlighting who has priority within a street. For most roads, the carriageway is considered the domain of the car, although there is growing use of shared street concepts in low speed environments. Likewise the footpath is the domain of the pedestrian and material selection and cross-gradients need to reflect this. However, as this can be seen from the adjacent photos, consistent surface treatment and gradients are critical to reinforcing pedestrian and vehicle legibility. Variable crossfalls can create extreme discomfort to some users such as arthritis sufferers or those with joint replacements. The visually impaired may find it difficult to discern the profile change, leading to trips and falls. Where possible, the crossfall in a footpath should be 2%. This enables pedestrians, and especially those with mobility impairments, to move along the footpath without experiencing sideway forces into the carriageway, while still providing for adequate drainage. The steeper gradients used at driveways and accessways should be restricted to the furniture zone or within grass berm as shown in the adjacent sketch. Where there is insufficient space, the impact of the change in crossfall should be minimised as far as possible.

DESIGN QUESTIONS

Does the footpath have clear priority for pedestrians in layout and material choice and does the surface treatment match with priority?

Is visibility adequate especially between pedestrians and accessways?

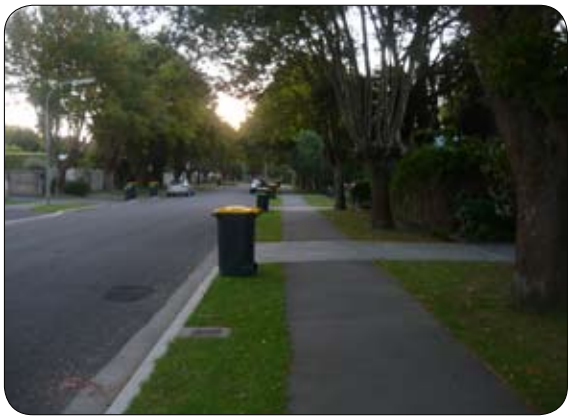
Is there any crossfall change at the accessway which interrupts the 'flow' of the footpath?



✓ The crossfall of the through route should be 2%

✗ While originally designed as a 'feature' in the landscape design, the change in material for accessways gives the perceived impression of vehicle priority across the footpath.

✗ The photo shows an inappropriate treatment for accessways, giving perceived priority to vehicles entering and exiting properties



✓ The photo shows an appropriate treatment where there is a continuous footpath providing a sense of priority to pedestrians. Note the consistent gradient for pedestrians along the length of the footpath.

E10 Road Crossings

Where possible, pedestrian crossing points should follow natural desire lines, often linking to destinations such as schools, shops or health facilities. In nearly all cases desire lines follow the shortest possible route from A to B. On average the maximum walk distance is 5 to 7 minutes for short trips or errands, and any detours imposed on a pedestrian reduces the physical distance which can be travelled in this time period.

In common design practice, crossing points and intersections have been primarily designed around vehicles. Often this delivers a far from ideal situation for pedestrians. The optimum solution is a balance of the two, where the potential contact time between pedestrians and vehicles is minimised, pedestrian desire lines are followed, and pedestrian crossing widths are minimised. This is achieved through integrated design, often with the installation of kerb protrusions and refuge islands. An undesired option is the installation of barriers to force pedestrians to change direction, thereby lengthening their travel time. Current international best practice is seeking to remove or reduce such barriers from the urban environment ('Manual for Streets' prepared by the British Department for Transport, 2007).

✗ The distance a pedestrian has to cross is considerable with a slip lane for vehicles adding to the possible directions from which oncoming traffic can approach.

Tactile paving is important for assisting visually impaired to cross the road.

✓ Kerb protrusions with good signs highlight to both pedestrians and motorist where the best place to cross the street is. Kerb protrusions also reduce the road crossing distance. Note, the sign does not obscure a crossing child.

DESIGN QUESTIONS

Are pedestrians able to cross at convenient locations (Along desire lines to minimise travel time)?

Is the distance travelled on road carriageway minimised?

Is there a choice of crossing facility?

Are drop kerbs provided? Do they have tactile raised paving to aid visually impaired pedestrians?

Does the crossing point provide sufficient visibility between vehicles and pedestrians, especially children?

Does the width of the crossing point meet standards (a refuge island needs a minimum 1.8m width to accommodate wheelchairs or prams)?

E11 Tree Planting and Landscaping

Vegetation and trees can transform a street and dramatically improve streetscape quality. Well designed landscaping can add significant value to developments by softening hard surfaces and enhancing the street users experience.

BENEFITS

Good landscaping within the road reserve improves the amenity of a neighbourhood and increases the value of adjoining properties.

*Will achieve design principles: **Retain, Reduce, Safe, Enhance***

Given a limited budget, the most effective way to improve a street would be the planting of trees (depending on the location of underground utilities). Trees can transform a street more easily than any other physical improvement. When planted in lines along a kerb or in the parking zone they can effectively separate pedestrians from vehicles, as well as providing oxygen, mottled or full shade and splashes of green which is a psychologically restful, agreeable colour. Trees improve the overall amenity of a street which in turn can reduce the perceived time spent walking to a destination. As a general rule of thumb, the ideal spacing of trees is usually one tree per frontage as a minimum, with some variance in terms of tree species and road width, but no closer than 6m to the right (when exiting) of a driveway where sightlines may be affected.
The standard and quality of tree planting and landscaping play an important role in establishing, and maintaining, the identity, visual interest and character of a subdivision.

Vegetation Size and Canopy Height

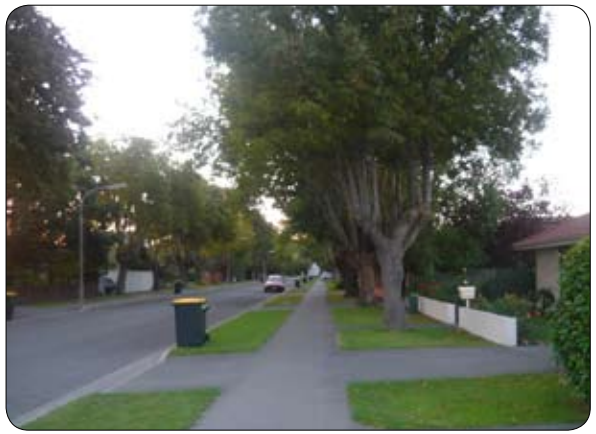
A street tree planting guide with types of species selected for particular roads, based on the road hierarchy would ensure plant species, mature heights and appearance are appropriate for individual streets. In general, the bigger the road the bigger the tree species can be. The same is true for smaller, local roads or alleyways. In all cases it is important to plan for growth and provide adjacent root space.

The use of shrubs or grasses that grow within 400mm -1800mm should be avoided where sightlines maybe affected. Height clearance drawings are provided in the Land Development and Subdivision Principles and Requirements 2008 for greater detail.

Functionality of the Road

The placement of trees and vegetation is equally as important as selecting the correct species type. Tree locations need to be such that they do not affect the functionality of the street as a transport corridor, for both pedestrians and vehicles alike, as well as avoid creating inter-visibility problems between pedestrians and vehicles. Space is limited in the road corridor and the pedestrian through route is often compromised by ill-sited trees or vegetation. As a general rule, the ideal sites for tree plantings are in the furniture zone (between the footpath and parking zone) or in quieter low speed environments within the parking zone itself.

Correctly positioned street trees have the ability to slow traffic speeds by creating side friction and focusing driver attention. By positioning trees close to or within the road (parking zone) it is possible to maximise the impact trees will have on drivers while minimising adverse shading effects on adjacent properties. However, this needs to be balanced with the purpose and speed environment of the road.



This street has sufficient space for a clear pedestrian route as well as large street trees. Placement of trees would have been better in the strip closer to the road to provide a buffer between vehicles and pedestrians as well as reducing shading issues for adjoining properties.

Available pedestrian space is reduced due to overhanging vegetation and the adjoining embankment forcing pedestrians on to the road

This example shows an established street retrofit achieving multiple outcomes, mature deciduous trees provide for amenity values, increased sunlight in winter and shade in summer, a pedestrian safety buffer and higher property values.

The placement of street trees is at regular, close intervals and provides a buffer for pedestrians from traffic. The species chosen reflects the size of the road corridor and the pedestrian through route is unaffected. Tree species should be deciduous in narrow streets where there is increased shading, which will provide shade in summer and open sunlight in winter. Evergreen tree species will be appropriate in wider streets where there is greater scope for planting locations.

DESIGN QUESTIONS

Can existing vegetation be incorporated into the design? Is there a lack of planting along the street?

Would existing/proposed trees or vegetation restrict pedestrian or vehicle movement along a street?

Is there sufficient space available for the planting of trees or should an alternative site be investigated?

Would lower vegetation be a suitable alternative if planting difficulties exist?

Can vegetation or associated structures provide a drainage function?

E12 Surface Treatments for Roads and Footpaths

Selection of surface treatments should reflect local context, level of use and can be used creatively to influence street users' behaviour.

BENEFITS

Specifying good quality surface finishes which are relevant to the local environment ensures that long term maintenance costs are accounted for and the cost-benefit ratio of using a particular material is maximised.

Will achieve design principles: ***Reduce, Enhance, Deliver***

Surface treatments need to reflect the environment in which they are laid and the importance of hierarchy which may be given to a network of streets. In high pedestrian areas it is more appropriate to use high quality materials such as pavers or stone to provide additional amenity.

In typical urban and suburban streets low cost, easily replaced and repaired materials are likely to be more suitable. The importance or hierarchy of a street in a network should be reflected its surface treatment. When selecting a surface material, early consultation with Asset Managers within Council will quickly identify if a finish is suitable.

For most residential situations, a simple concrete surface is the best solution - low cost and easily maintained

While wooden decking is a cheap and effective way of installing paths when there is concern over possible damage to nearby trees, maintenance and slip issues need to be taken into account. Other methods using concrete, pavers or HMA should be investigated.

While adding character relatively cheaply, soldier courses of paving can cause maintenance issues and tripping hazards in the long term. Their use needs to be based on the surrounding character and whether there is sufficient pedestrian use.

Paving is suitable for high pedestrian shopping areas. However when specifying pavers, long term maintenance requirements need to be taken into account such as the continuity of supply of materials.

DESIGN QUESTIONS

Does the surface treatment match the environment / location?

- *pavers and granite - aesthetic, high quality areas*
- *concrete and asphalt - functional*
- *loose gravels - recreational (low use by wheelchairs, pushchairs)*

Is the surface in good condition?

Can locally sourced material be used, reducing transport costs as well as the carbon footprint of a development?

Have Council staff been consulted about the suitability of materials?

E13 Stormwater Management

Street design offers significant potential to integrate Low Impact Design treatment practices that enhance amenity and support drainage infrastructure.

BENEFITS

The implementation of low impact design solutions can reduce construction costs, long term maintenance costs and future pressure on existing stormwater infrastructure from new developments.

Will achieve design principles: ***Integrate, Retain, Reduce, Enhance, Deliver***

Good drainage is a key requirement to ensuring that public places, streets and parks are maintained in a functional manner. Care needs to be taken to ensure that drainage requirements do not detract or lessen the walking experience (e.g. prevention of water ponding at pedestrian crossing locations).

Low Impact Design Treatment Practices

Where appropriate, Low Impact Design treatment practices can be used to both provide drainage function and enhance amenity. Consideration of the site constraints and opportunities along with design objectives will determine the appropriateness of low impact design options for the development location.

An infiltration trench has been installed to manage stormwater and is a key design feature in this new development.

Stream 'daylighting' was the preferred option to address an undersized pipe in this street retrofit. That design provides for a high degree amenity while still catering for drainage requirements.

Deep dish channels are a hazard to pedestrians due to the potential fall. This is especially hazardous to a visually impaired pedestrian.

Stormwater is directed into rain gardens reducing stormwater 'peaks' caused by a increase in impervious surfaces. It can also provide for infiltration into the groundwater which can then flow into streams and watercourses. It is also beneficial for plant health as it provides additional water to plants in urban locations where drought-like conditions are common.

Examples of low impact design treatment practices include:

- Rain gardens*
- Swales
- Permeable pavement*
- Tree pits and planters
- Open water courses

** Can be expensive to install and maintain as well as having high embedded energy*

DESIGN QUESTIONS

Is drainage adequately provided for?

Is there any ponding which will affect the development?

Can Low Impact Design techniques be implemented and do they represent good whole of life value?

Have Council staff been consulted early in the design process to assist with developing a good solution?

E14 Street Retrofit Working Example

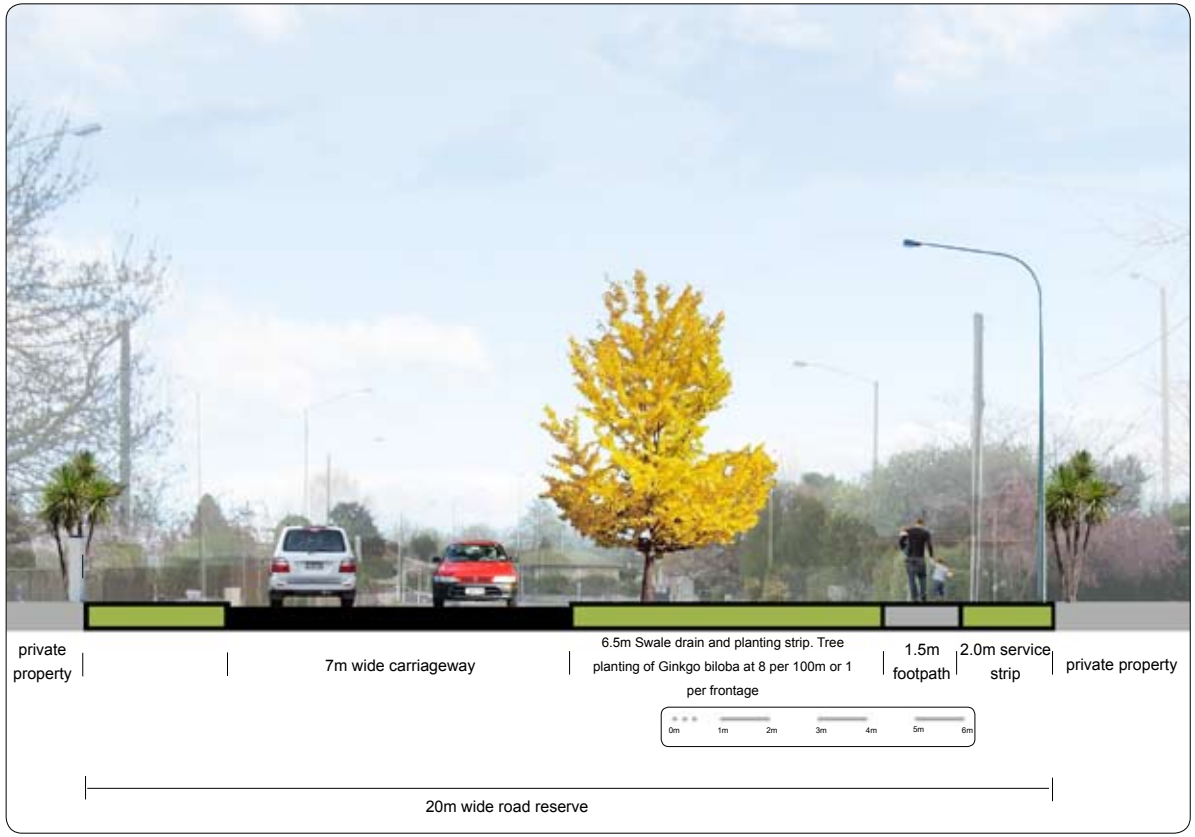
BENEFITS

A well designed street with high amenity can add significant value to adjoining properties as well as promoting sustainable transport options.

Will achieve multiple outcomes such as traffic calming, amenity, low impact stormwater disposal and reduced maintenance costs.

Will achieve design principles: ***Deliver, Select, Connect, Enhance***

Figure E14.1 Cross section showing possible design road option



Retrofitting an existing street, utilising all or some of the measures outlined in this guide, can greatly improve the amenity of a neighbourhood by:

- ☐ Reducing car speed and traffic calming. Appropriately sized road widths help to encourage the desired traffic speed, traffic flow, parking and use of the street
- ☐ Better allocation of space for different users or increased shared space
- ☐ Improved pedestrian / cycling environment to encourage sustainable transport options
- ☐ Planting of street trees to provide shade and shelter
- ☐ Reduced construction / maintenance costs as a result of reducing hard paved road surfaces. Less costly to develop and maintain over their design life as well as less reliance in the long term on non-renewable resources
- ☐ Provision for bus stops
- ☐ Implementation of low impact design techniques to reduce stormwater peaks entering existing infrastructure as there are less impervious surfaces. This helps to reduce runoff and the extent of impacts on water quality.
- ☐ Retain existing levels and assets where possible by incorporating them into the design.

Figure E14.1 Existing view of a typical low volume road

Figure E14.2 Photo-illustration showing the retrofitting of an existing urban street

KEY DESIGN ELEMENTS

1 Traffic calming measures - change in material with a slight change in elevation

2 Change in road alignment to slow traffic

3 Narrowing of road carriageway to 7m (including on-street parking)

4 Improved pedestrian crossing facilities

5 2.5m shared walkway

6 Footpaths on both sides of the road due when the road is longer than 100m

7 Wide grass swale for stormwater collection

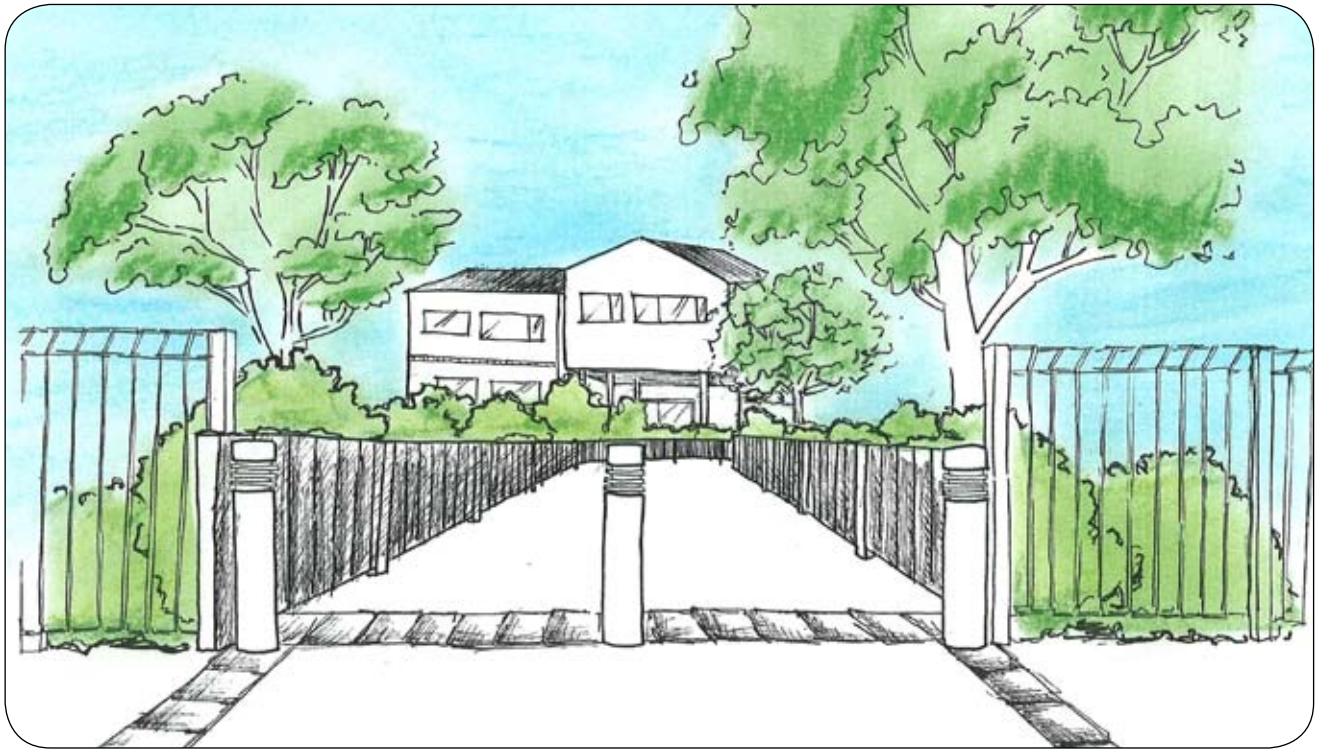
8 Rain gardens collecting road runoff

9 Low level landscape planting at intersections to provide amenity

10 Bus stop positioned close to the intersection to maximise pedestrian connections to surrounding streets

11 Avenue planting of street trees

This photo shows an alleyway with adequate space allowance for both cyclists and pedestrians, and therefore is ideal for retrofitting to accommodate various users. Corrugated iron fencing enclose the alleyway and reduce natural surveillance, therefore creating a space which feels enclosed and unsafe.



Potential retrofitting includes opening up the alleyway using bollards to allow better cycle access. Open fences and low vegetation increases natural surveillance from surrounding residential properties. Painted lines within the alleyway delineate cycling and pedestrian zones to reduce conflicting uses of space. If the alleyway was part of a new development, it is important that clear lines of sight are present, allowing views through to the end of the alleyway, i.e. no bends.

F IMPLEMENTATION PROCESS

F1 Design Process and Stages

STAGE 1

Identify and analyse the wider suburb / neighbourhood context

↓

STAGE 2

Identify and analyse the characteristics, constraints and opportunities of the site

↓

STAGE 3

Design the proposal using the principles outlined in this guide

↓

Pre-application meeting with the Council

↓

Consult with affected parties

↓

Refine design proposals

↓

Lodge resource consent application

DESIGN PROCESS

Following Stages 1 and 2, a pre-applicaiton meeting should be undertaken with Council. The following outlines the procedure for the design process to ensure the best urban and sustainable design practices are implemented by developers and Council:

a. Trigger for initiating a pre-application meeting

- ☐ It is a subdivision creating a new public space e.g. new roads, reserves, open spaces, or is of strategic or community value where design issues are important
- ☐ It is a Council development project which has significant design implications e.g. significant road upgrading, new road or community facilities such as an Aquatic centre
- ☐ There are opportunities for innovative design and best practice

b. Who should attend?

Core Team

- ☐ Senior Consents Planner
- ☐ Subdivision Engineer
- ☐ Strategic Policy Planner
- ☐ Project Manager (for Council Development Projects)

Other attendees as required

- ☐ Infrastructure Engineer
- ☐ Parks and Recreation
- ☐ Landscape Architect
- ☐ Transportation Engineer
- ☐ Community assets/services

c. Process

- ☐ Sketch/outline of proposal emailed to core team at least 2 days prior to meeting
- ☐ If external participants involved, Council review team meet prior to meeting to reach consensus on main points;
- ☐ Minutes to be taken at meeting;
- ☐ Minutes are circulated with team members with agreement reached on design outcomes;
- ☐ Core team to review draft requirements or project concept design prior to release to ensure design outcomes will be met
- ☐ If there is disagreement with draft requirements or project concept design then the design and review team regroup to reach a consensus
- ☐ If no consensus then final decision on design issues rests with the appropriate Hastings District Council Group Manager.

F2 Locking In Quality

There are a number of mechanisms available to the Council, developers, and interested parties (through consultation or submissions) to ensure that the design elements of a subdivision and associated infrastructure are implemented and maintained over the lifetime of the neighbourhood.

RESOURCE MANAGEMENT ACT

The Council has the ability to grant consent to subdivisions on the basis of their consistency with the District Plan and any other matters considered by the Council to be relevant. This includes the ability of the subdivision to meet the design recommendations of this guideline, under Section 104(1)(c) of that Act.

The Council can impose conditions on any consent it grants requiring the:

- ☐ Approval of engineering works (detailed design of earthworks, roads, and infrastructure).
- ☐ Implementation of the scheme plan and design including landscaping.
- ☐ Consent notices to register relevant requirements on the titles of new lots in perpetuity.
- ☐ Maintenance and monitoring of infrastructure, including obligations for a set period after the release of the Section 224 Certificate.
- ☐ Legal and physical protection and restoration of areas of native vegetation, wetlands and habitats.

CONSENT NOTICES

Consent notices can be registered on the titles of new lots to identify information relevant to the development of that lot and can include conditions which must be met on an ongoing basis. Traditionally consent notices have been used to inform landowners and their consultants of geotechnical constraints. However, they are also increasingly used to provide for the ongoing maintenance of on-site infrastructure, the protection of natural features and the management of buildings on a site.

Consent notices can be used to:

- ☐ Require the development of on-site stormwater detention and its continued maintenance.
- ☐ Protect features on the site from inappropriate earthworks or development, including vegetation and waterbodies.
- ☐ Limit the height of fences within front yards or adjacent to reserves.
- ☐ Protect adjacent parking bays from being used as driveway crossings.
- ☐ Ensure buffers from hazards (building line restrictions) and minimum floor levels.
- ☐ Manage the placement and location of buildings on a site.
- ☐ Require physical and legal protection of ecologically important areas and their ongoing management.

COVENANTS

Covenants and encumbrances are private legal mechanisms, used by many developers, to lock in the quality of their subdivision design. These are registered on the titles of the new lots and can cover a wide range of obligations including standards and guidelines for:

- The design and location of dwellings and garages, and the manner in which a dwelling connects with and relates to the street. Typically these can be very short, requiring dwelling design to comply with minimum architectural/building quality standards:
  - Ensure the dwelling fronts and relates well to the road.
  - Locate garages a specified distance back from the front facade.
  - Minimum architectural/building quality standards.
  - Minimum requirements for the amount of glazing from a living or dining room that faces the street without obstruction.
  - Involve an entry statement that stands out from the front facade and connects directly to the street via a path or similar.
  - Locate outdoor living spaces to the side or rear to avoid the need for tall solid fencing.
- The height and location of front fences.
- The location and width of driveways and vehicle crossings.
- The preservation of vegetation and streams
- The development of on-site stormwater detention and its continued maintenance.
- The maintenance of common amenities and services.

BONDS AND CONTRIBUTIONS

A developer may volunteer to provide a bond over any elements of uncertainty relating to a subdivision to help manage any doubt over its adequacy. An example is the use of a bond for the maintenance and replacement of vegetation and street-trees that decline during the construction and post-consent maintenance period.

Developers may also volunteer contributions of money or resources to help mitigate the effects of a subdivision on the local environment, such as to improve a local reserve network or the interface with adjacent properties. An example can be to pay for high-quality boundary fencing and landscaping (on both sides) with an adjoining site, or to make a new and attractive pedestrian crossing over a road from an existing developed area into a new reserve

F3 Putting It All Together

Subdivision Planning

Neighbourhood Context

There are a number of elements which are essential to planning a successful subdivision:

- The existing and planned built environment;
- Movement Networks (arterial roads, local roads, cycleways, pedestrian routes)
- Infrastructure, both existing and planned, and any possible capacity issues;
- Existing natural features such as waterways, topography, viewshafts or significant trees or native vegetation.

Site Analysis

Examples of elements that could be included in the site analysis include:

- Topography and landforms
- Flora and fauna
- Natural features, wetlands and streams
- Soils, groundwater and stormwater
- Coastal conditions
- Viewshafts
- Site orientation, solar, wind and climatic conditions
- Existing native vegetation and significant trees
- Existing buildings and structures
- Heritage and cultural elements
- Surrounding road network and possible connection points
- Existing and proposed cycleways, walkways or bridle paths which link with the site
- Existing pedestrian desire lines which may exist through the site
- Location of nearby shops, commercial or community facilities
- Possible contamination issues and natural hazards

Subdivision Design

Connectivity

Examples of good connectivity include:

- Maximised number of connections;
- Small street block, typically 80-100m;
- The use of cul-de-sacs is minimised, and where used are no longer than 75m in length;
- Pedestrian and cycle links are provided at the end of cul-de-sacs and should be at least 6m wide.

Street and Block Orientation

Examples of good street block orientation include:

- North - south road orientation maximising potential solar gain for houses
- The fronts of properties face the street, and the backs face the backs of other properties
- Minimise earthworks by working with the landscape
- Retention of natural features, drainage paths and waterways
- Public open spaces are bounded by streets

Lot Design

Examples of good lot design include:

- Variety of lot sizes and shapes (predominantly rectangular)
- Walkable block sizes
- Potential for mixed use development on corner sites. Flexibility for change.
- Integration of stormwater management and public open space.
- Good road connectivity with roads designed to create a low speed environment
- Carparking and allotments facing onto public open spaces to provide good access and a high level of passive surveillance
- Use of service lanes for medium and high density developments
- Avoidance of rear lots

Open Space Design

Examples of good open space design include:

- The open space is connected to a larger network of open spaces and corridors, being located within walking distance of its main users;
- Good pedestrian / cycle links through the space to connect areas and increase surveillance and safety;
- Installation of play equipment and facilities which meet the needs of all age groups of the local community;
- Good links with nearby schools, kindergartens, retirement homes and commercial areas;
- Recognise and enhance ecological and hydrological values of the space
- Good surveillance from adjoining land uses, i.e. open fences or road boundaries. The use of back sections should be avoided where possible.

Street Design / Locking in the Quality

Street Design

Examples of good street design include:

- The quality and space provides for all street users, providing amenity and character to the development or retrofit;
- Sufficient space is provided for the road/ street's purpose and future uses;
- The width of the road/street reflects the status of the road and the number of vehicles, cyclists and pedestrians it is likely to carry;
- The design maintains good sightlines for users, minimising potential conflict points between different users;
- For high volume roads, competing uses should become more segregated and a higher level of control for areas where potential conflicts may occur;
- For low volume roads, greater sharing of the street can occur. Traffic calming measures can be implemented and should reflect the desired speed environment.

Locking in the Quality

To ensure the quality designed during the development process is implemented, the following measures should be investigated:

- District Plan / Resource Management Act
- Consent Notices
- Covenants
- Bonds and Contributions

F4 Links and Resources

Links with other Council and national initiatives

- ☐ The Guide – good practice landscape guidelines for subdivision and development in the Hastings District (HDC 2005)
- ☐ Hawke's Bay Regional Council Waterway Design Guidelines
  - ☐ Low Impact Design, April 2009
  - ☐ Industrial Stormwater Design, April 2009
  - ☐ Stormwater Management, May 2009
  - ☐ Small Dam Design, April 2009
- ☐ Ki te Hau Kainga, New perspectives on Maori housing solutions (Housing NZC, 2002)
- ☐ National Guidelines for Crime Prevention through Environmental Design (Ministry of Justice, 2005)
- ☐ Urban Design Protocol (Ministry for the Environment)
- ☐ Urban Design Case Studies, 2008 (Ministry for the Environment)
- ☐ People & Places & Spaces, A Design Guide for Urban New Zealand, March 2002 (MFE)
- ☐ Walking the Walk – How walkability raises home values in US cities (USA – EPA, August 2009)
- ☐ Urban Design Compendium, English Partnerships and the Housing Corporation(UK), 2007 - See www.urbandesigncompendium.co.uk
- ☐ Manual for Streets, UK Department of Transport, 2007
- ☐ Link & Place – A Guide to Street Planning & Design – Mssrs Jones, Boujenko and Marshall, 2007
- ☐ Low Impact Urban Design and Development: the big picture (Landcare Research, 2009)

F5 Examples

The following areas demonstrate best practice in subdivision design or retrofitting streets;

New Subdivisions

- ☐ Ferndale, 148 Ngarara Road, Waikanae
- ☐ Jade Gardens, Waterstone off Marzengarb Road, Paraparaumu
- ☐ Raumati Views, Simpson Crescent off Titoki Street, Raumati
- ☐ Northwood, Christchurch
- ☐ Watford Street, Strowan, Christchurch
- ☐ Aikmans Road, Merivale, Christhchurch

Road Upgrades

- ☐ Lumsden Road, Hastings
- ☐ Batt Street, Chaytor Street, Palmerston North
- ☐ Miro, Matai, Maire Streets, Woburn, Lower Hutt

Urban Renewal

- ☐ Talbot Park, Glen Innes, Housing NZ Corporation
- ☐ Waitangi Park, Wellington City
- ☐ Croucher Square, Richmond Town Centre, Richmond

Publication prepared for: Hastings District Council
by: MWH Ltd + Vivacity Ltd October 2009