KAPITI COAST DISTRICT COUNCIL

BEST PRACTICE

a design guide for developers, planners, surveyors, architects, engineers and others




SUBDIVISION

> This guide seeks to inform best practice in the design and layout of subdivision.

CONTENTS

Quality built environments cannot be achieved without good subdivision.

The Kapiti Coast is home to an increasing number of households, each seeking a comfortable, safe, and affordable home.

When delivering the environments for these homes, a strong structure of streets, allotments, community amenities, and services is critical to ensure that their contribution to community well-being is maximised.

"SUBDIVISION"

In this guideline, the focus will be on greenfield 'urban' subdivisions. While the principles within may apply to some degree to all subdivision, this guideline is not intended to address rural subdivision.

Please contact the Council on ph (04) 296 4700 for further assistance.

KAPITI COAST DISTRICT COUNCIL

1 INTRODUCTION

- Purpose of the guideline and the Council's approach;
- Core design principles

Purpose of this Guideline

Traditional approaches to land subdivision have emphasised lot yield efficiency, engineering, and surveying requirements. These elements are important but the **primary objective** of planning and design is ultimately to create **liveable communities** that are safe, sustainable, and rich in amenities for users.

This guideline sets out how **neighbourhoods** can be structured and the layout of streets, lots, and networks **designed**, in ways that achieve **maximum benefits** to the subdivider, end-resident, and community.

It emphasises responsive and **innovative design** as opposed to rigid adherence to existing development doctrine. Developers are encouraged to look beyond the minimum standards and consent requirements of the District Plan and to **explore opportunities** that deliver improved community environments, both now and into the future.

Applications that exhibit **quality design** and careful consideration of the issues will be supported by the Council to ensure **win-win outcomes** are delivered.

THE COUNCIL'S APPROACH

The Council is committed to the promotion of best-practice sustainable outcomes for the District. To achieve this, the following objectives underpin the approach taken:

- TRANSPARENCY
  Resource management can too often become adversarial between groups. The Council has attempted through this guideline to communicate greater certainty to the community about how it will approach and position itself on applications, including those that seek alternative outcomes to the District Plan's normal provisions.

- PARTNERSHIP
  The best outcomes can only be achieved when all participants aim for the same target. The Council has attempted through this guideline to stimulate collaboration and mutual trust by outlining its broad position and the reasons for this, through the 'design elements', and 'win-win' parts of the guide.

- EQUITY
  The Council believes that fairness and reasonableness must be the basis for all resource management outcomes. Accordingly it commits to be open minded and pragmatic towards innovative subdivision ideas and problem solving.

Core Design Principles

There are a range of key issues that need to be addressed in the development of new neighbourhoods and subdivisions. They directly relate to the quality of environments we create:

logic
Should underpin all design. Good subdivision is more focussed on a clear line of logic and issues-based response than on the degree of compliance or non-compliance with particular District Plan rules.

integrate
with surrounding neighbourhoods, through the roading and open space networks. Encourage pedestrian and cycle activity around convenient access and routes.

layout
should contribute to the local identity of Kapiti Coast, responding to site characteristics, the surrounding environment, notable features, views, and identified district-wide strategic initiatives.

reinforce
existing local focal points in the community, ensuring that residents are in walking distance of a range of amenities. Provide new nodes and focal points logically on the movement network.

variety
of lot sizes and other compatible uses encourages a diverse community

connect
streets to provide accessibility and choice in the local movement network, reducing travel distances, vehicle emissions, and money spent on petrol that could cumulatively help the local economy.

intensify
residential density in close proximity to town centres and public transport corridors.

convenient
designs ensure residents have convenient access to public parks, open space and community facilities.

open spaces
need to be safe, legible, cost effective to maintain and capable of providing a variety of recreation uses.

safe
developments are based on lots fronting the road and public open spaces, providing informal surveillance of the public realm.

low impact
approaches to managing stormwater run-off and other resource use helps maintain the long-term environmental quality of the Kapiti Coast.

ecological and heritage features
should be protected and enhanced. This can be achieved in a manner that adds-value and uniqueness to subdivisions.

2 SUBDIVISION-WIDE CONSIDERATIONS

- Neighbourhood context and site analysis
- Designing with the landscape
- Movement and access
- Neighbourhood design
- Infrastructure

2.1 Neighbourhood Context and Site Analysis

The added value flow-on effect from **careful neighbourhood context** and site analysis can directly benefit future residents through **better quality** outcomes.

It is important to identify the **opportunities** available on the site and any likely conflicts with the District Plan early. There will be an overriding **logic** for every subdivision scheme, where appropriate and **sustainable** outcomes are identified. Involvement of the Council as early as possible to help identify and refine this logic will help avoid misunderstandings and differences during application processing.

NEIGHBOURHOOD CONTEXT ANALYSIS

The following matters should be considered in the neighbourhood context analysis, in terms of both constraints and opportunities:

The pattern of development in the neighbourhood:

- movement networks (arterial roads, local roads, cycle and pedestrian routes)
- opportunities to connect, direct routes and walkable catchments ("pedsheds")
- open spaces, parks, and linkages

The built form, scale, amenities and character of the surrounding neighbourhood:

- existing and planned local centres, community facilities (schools, parks), public transport and direct routes to these
- existing and planned residential areas, surrounding subdivision lot density, housing typologies or styles, parks and networks
- existing infrastructure and reticulated services (including overhead power lines), available connections and capacity

1. subject site
2. local shops / mixed use
3. school
4. reserves / parks / open space
5. existing business / employment
6. existing residential
7. rail station

Notable features or characteristics of the neighbourhood:

- landscape or landform features such as dunes, wetlands, streams, rivers, vegetation and heritage features
- significant views and aspect

SITE ANALYSIS

A detailed analysis of the site and its surroundings facilitates the design of appropriate subdivision responses. The following matters should be considered:

- topography and landforms
- flora and fauna
- natural features, wetlands and streams
- soils and groundwater
- coastal landforms
- views and orientation, solar access, wind and climatic considerations
- existing buildings and structures
- heritage and cultural sites and features
- all possible vehicle access points
- opportunities for street connections to neighbouring sites
- any existing or proposed opportunities for cycleway, walkway and bridleway linkages
- overland flow paths and stormwater catchments
- historic or existing contamination
- local sources of noise, dust, odour, vibration, light glare
- natural hazards
- character and land uses of surrounding area

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

1. subject site
2. existing dwelling
3. existing business / employment
4. existing high-density residential development
5. existing residential dwellings
6. cul de sacs
7. existing public open space locked up at the 'back'
8. pedestrian link to rail station

The site analysis identifies surrounding uses, movement networks and open space / natural features

1. new residential layout
2. relocated public open space with frontage and access
3. public pedestrian footpaths
4. new link roads
5. retain existing trees

Development opportunities and the site layout are established based on the important attributes identified in the site analysis. An opportunity exists for improving access through the site with the potential development of a new public open space of greater legibility.

Benefits of this approach:

- enables cost effective and environmentally responsive design.
- identifies and accommodates natural and cultural elements in and around the site, creating a unique identity.
- enables the subdivision to be integrated into its surrounding neighbourhood.
- identifies issues 'up-front' before spending time and money on problematic responses.

Win-Win outcomes:

- Include the neighbourhood context and site analysis within the subdivision application to illustrate the rationale and logic underlying the subdivision design.
- The Council will support non-notified applications where a clear and logical benefit is obvious within a proposal's logic.

2.2 Designing with the Landscape

Features such as vegetation, landforms and waterways can add **character** and **interest** to the subdivision and provide **benefits** in terms of maintaining established natural ecosystems.

Subdivision has often historically involved the wholesale clearance of these features, and piping of water courses. Subdivisions are now **increasingly** being designed to **take advantage** of **features** within a site to create identity, and to reflect increasing community interest in environmental issues.

INCORPORATE STREAMS AND VEGETATION INTO THE DESIGN

Design Elements

- Incorporate streams and vegetation into the design of subdivisions through the provision of open spaces where they can contribute to recreation networks and/or maintain ecological values.
- Connect publicly accessible open spaces with streets, ensuring these spaces are visible to and overlooked by adjacent sites and dwellings. This allows adjacent sites and the subdivision to capture some of the value of this open space.
- Retain and restore stream networks by planting stream banks in suitable indigenous species. Seek the assistance of an ecologist or talk with the Council to identify the most appropriate method to restore a stream.

Existing streams and vegetation are often poorly treated by new developments if they are not integrated into the scheme. In this example much of the development backs onto the existing stream.

With careful integration streams and vegetation can become a valuable natural asset to the amenity of the new development. The site now offers improved pedestrian access (shown in brown) with road frontage to open space for passive surveillance.

Benefits of this approach:

- Maintains and enhances ecological value
- Creates unique identity
- Maintains natural stormwater paths
- Adds value to lots and subdivision

Win-Win outcomes:

- Provide for watercourses on the basis that the best outcome is more important than area-based open space requirements. The Council will support the merits of reduced or irregular lot or open space sizes to accommodate this.
- The Council will consider the investment in and value of additional landscaping or ecological retention that may otherwise not have occurred as a positive effect when considering applications.
- The Council will include the value of significant ecological benefits as part of the reserve contribution.

RESPONDING TO THE COASTAL LANDFORM

Public access to and enjoyment of the coastal environment is an **important** component of living on the Kapiti Coast. Coastal ecology can be significantly affected by residential development through the disturbance of natural erosion and accretion processes, loss of sand dunes and disturbance of bird nesting areas.

Development near the coast needs to **respond** to the existing ecology and its protection, coastal hazards and the **maintenance** of public access.

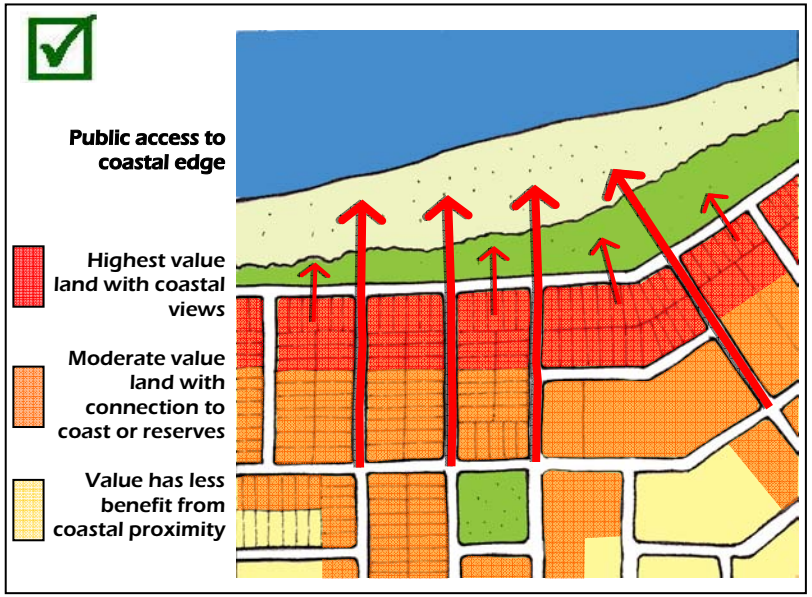
Design Elements

- preserve dune systems, other coastal features and habitats.
- consider the use of restrictive covenants or other techniques that can prohibit pets in sensitive habitat areas.
- restore areas of degraded coast through suitable indigenous plantings and, where necessary, protective fencing.
- 'front' beaches and dune systems with public roads, maintaining public access to them.
- incorporate public parks with any esplanade reserves to increase the amenity and utility of these spaces.
- provide car parking and public amenities for visitors.

Sub-optimal layout that privatises all benefit of the coast to immediately adjoining properties. Few other properties enjoy its amenity.

Benefits of this approach:

- Preservation of the natural character and ecology of the coast
- Maintenance and improvement of public access
- Avoidance of natural coastal hazards
- High values penetrate deeper into subdivisions than just the immediate area adjoining the coast



A layout that maximises physical and visual connection to coastal amenities.

Win-Win outcomes:

- Provide for the coastal environment on the basis that the best outcome is more important than other requirements. The Council will support the merits of reduced or irregular lot sizes, and innovative methods of ensuring good public access to accommodate this.
- The Council will consider the investment in and value of additional landscaping, ecological or landform retention as a significant positive effect (compared to the 'conventional' alternatives) when considering consent applications.

MANAGING EARTHWORKS

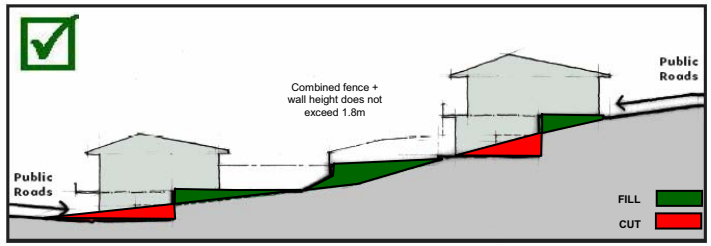
Earthworks for subdivision and dwelling development can have substantial and cumulative effects on the aquatic receiving environment, silting streams and estuaries, and altering catchments. They can also significantly alter topography, which could otherwise add to the local character and identity of the subdivision.

Earthworks are often a considerable expense to the developer and can have adverse effects if poorly managed. Design solutions which **limit the extent** of earthworks, reducing opportunities for erosion and sedimentation, and **retaining the site's natural features**, should be pursued.

There may be fundamental incompatibilities between the landform and desired 'end market' for a subdivision, especially if the land is 'lumpy' and nothing but flat sites with single-level homes are envisaged.

Large-scale earthworks are a significant cost to developers, and can require very specialised sediment and erosion controls. Source: www.arc.govt.nz

The 'flat earth' approach where the landform is expensively transformed into a series of low-amenity terraces. This facilitates a significant loss of local identity and legibility, and creates practical permeability issues. Areas of 'lumpy' landform may be highly suitable for development - but not in this manner.



Earthworks designed to provide areas of usable quality on dwelling sites while retaining much of the original slope profile can be relatively cost effective to achieve, and still create attractive lots.

Design Elements

- limit earthworks (volume and area), avoiding disturbance to the natural landform, steep slopes and adverse effects on aquatic environments. Only excavate areas required for structures and access.
- design the layout of roads and lots to work with the natural characteristics of the site.
- retain the site's topsoil, allowing the landscape to develop with new dwellings and avoiding the need to dispose large volumes of spoil to cleanfill sites.
- avoid subdivision that results in significant post-development earthworks on each lot to construct dwellings and driveways.

Benefits of this approach:

- Retains valuable landscape elements and helps establish character and identity.
- Fewer site works and less construction costs.
- Avoids 'flat earth' engineering approaches.
- Maintains water quality in streams.
- Reduces the scale of engineering structures such as retaining walls and engineered ponds.

Win-Win outcomes:

- The Council will consider layouts that deliberately minimise earthworks to achieve a good design as a positive effect when considering applications.
- The Council will include the value of significant ecological benefits as part of the reserve contribution.
- The Council will consider applications that demonstrate the need for minimal post-subdivision development earthworks as having positive effects (in terms of further adverse effects being avoided).

2.3 Movement and Access

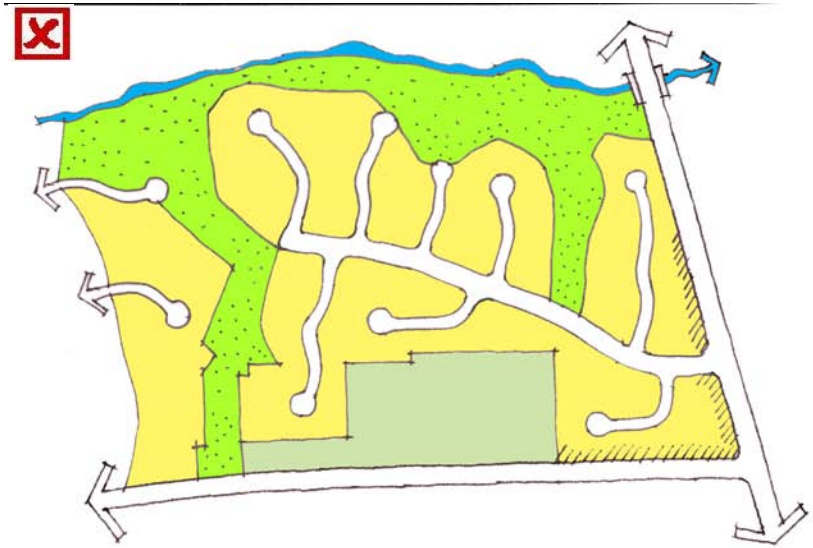
(refer also to the Kapiti Coast Streetscape Guideline)
The way in which movement networks are laid out is one of the most influential 'drivers' of urban form and how successful a place will be. This is because, unlike land uses and allotments, roads and networks **can not be easily moved, changed, or removed**.

The movement networks will also determine the way in which developments provide better or worse opportunities for safety, community, and social contact, privacy, and areas of intensity that will support local shops or amenities.

CONNECTED ROADS

A connected network of roads, lanes, and paths as opposed to a series of unconnected cul-de-sacs, increases accessibility for residents, allows for safer and more efficient movement of vehicular and non-vehicular traffic, and enables more efficient infrastructure provision. Over the longer term, it also delays the need for substantial arterial route widening to manage poorly distributed peak traffic flows.

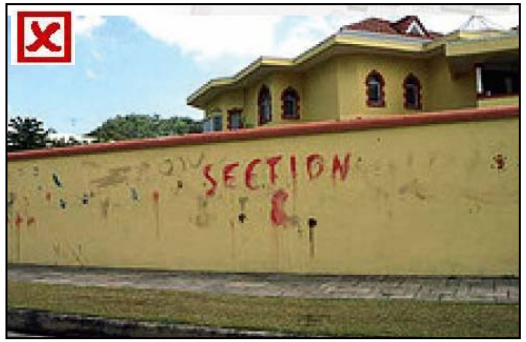
While subdivision applications are submitted on a site by site basis, there needs to be consideration of future connections, to ensure the neighbourhood and future developments are integrated and accessible. This includes the provision of roads, footpaths, cycleways, open space linkages and community facilities.



Non-permeable layouts, as shown above, do not provide users with a choice of alternative routes. Offering alternative routes as illustrated below can encourage walking and cycling as well as reducing vehicle kilometres travelled.

Design Elements

- Provide a road layout (including cycleways and walkways) with as many links to adjacent sites and surrounding roads as possible. This results in a choice of routes and transport modes from a highly interconnected road pattern. The use of dead-end cul-de-sacs should be avoided. Collaboration with adjacent landowners is a valuable tool.
- Design a road, cycleway, and walkway pattern that allows integration and easy direct access to and from bus stops, shops, schools, employment, parks and other amenities based on how people will logically seek to move through a space, including walking and cycling.
- Connected roads forming urban blocks (of less than 120m length) are better than a pattern of many cul-de-sacs and few through roads.
- Cul-de-sacs are appropriate to use only where other roading patterns would result in streams being piped or vegetation being cleared, where adjoining developed land prevents a through road, or where the topography is too steep to allow a safer connection. They should be straight, with a maximum length of 75 metres. Pedestrian and cycle links should be provided from the cul-de-sac head to an adjacent road or park, and be at least 6.0m legal width.
- Private right-of-ways, driveways and private ways should only be used to reach pockets of land that are inaccessible from a road. These should serve no more than 2 or 3 allotments.
- Intersections should be designed to facilitate reduced turning speeds, reducing safety risks to other users.



- Gated subdivisions are not appropriate as they do not support connected public street networks, and often result in lower safety standards than a best-practice layout.

The vehicular movement network (and resultant block structure) poorly integrates with a pedestrian and ecological network, undermining its potential amenity by presenting land use 'backs' along its length. The open space is poorly surveilled and accessed, and land uses are unable to enjoy the full benefit of its presence as solid fencing (needed to ensure privacy to back gardens and outdoor living spaces) prevents any visual connection to the open aspect.

Benefits of this approach:

- Reduces travel distances and car usage.
- Maintains contact between communities.
- Provides easy access to services and amenities.
- Provides a variety of routes.
- Routes are legible and easy to navigate.
- Direct connections make walking and cycling more viable options for short trips.
- Enhances community safety by increasing surveillance from passing traffic.

Win-Win outcomes:

- The Council will be more likely to support reduced road reserve and carriageway widths, and alternative road typologies when a connected network is being delivered.
- The Council will strongly support 'out of zone' uses such as suitably scaled local retailing at logical intensity points within a movement network, where it can be demonstrated as being a better response than standard residential uses.
- The Council will consider the sharing of open space, ecological, and road reserves to accommodate the achievement of integrated networks (e.g. allowing on-street parking bays within a recreation reserve).

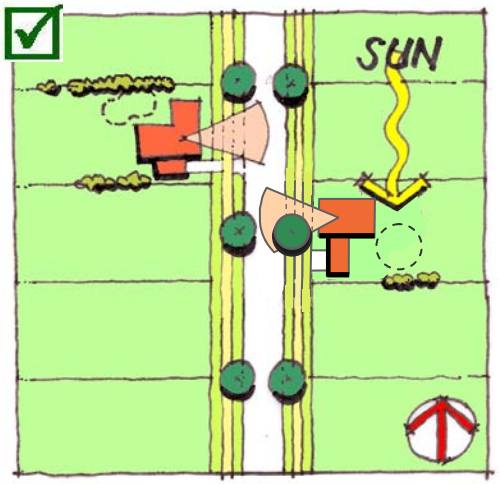
STREET AND BLOCK ORIENTATION

The layout of urban blocks, their size and length is important in maintaining a walkable neighbourhood. Blocks that are too deep or long limit the number of connected routes within a neighbourhood and increase the distances residents need to travel to services and amenities. This lowers the feasibility of pedestrian movement, and can add unnecessary vehicle kilometres travelled. Over a period of 10 or more years, this can add up to thousands of kilometres (and thousands of petrol litres) saved.

The orientation of roads and blocks should also ensure that lots receive adequate sunlight in a manner that will allow dwellings and other uses to provide a public 'front' to the road and a private 'back' for amenity.

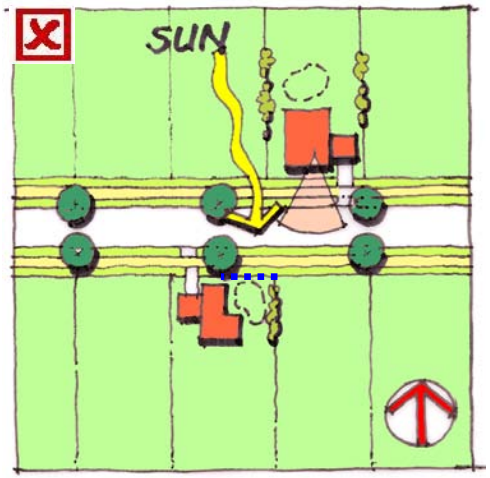
Design Elements

- Maximise opportunities for sunlight access by:
  - Aligning roads north/south and lots east/west where possible.
  - Providing south facing lots with north facing backyards for outdoor living.
  - Ensuring sunlight access to roads, including the selection of appropriate trees to provide sunlight penetration through winter.
- Limit the size and length of urban blocks to increase the choice of routes, and allowing for increases in residential density close to town centres.
- Avoid rear lots as they inherently and unavoidably generate public / private conflict along the sides of front and adjacent lots, and don't provide connection to the road, community, or amenities. They should only be used as a clear by-product of seeking to retain landscape / landform, or a similar objective.



Dwellings on a north-south road can:

- Easily orient for solar access
- Locate private outdoor living away from the public road, with privacy fences between lots
- Orient a living space (lounge, kitchen, dining) to allow passive surveillance of the street.



Dwellings on an east-west road can:

- Provide many difficulties for units on the south side as a natural inclination is to locate outdoor living spaces north. This in turn necessitates solid fences for privacy that preclude a good road interface
- Easily allow units on the northern side to orient for solar access and private outdoor living, while connecting to the road.

Benefits of this approach:

- All lots receive sunlight during the day.
- Future dwellings benefit from opportunities for passive solar gain.
- Lots maintain privacy with fronts to fronts and backs to backs.
- Maximum potential for surveillance and safety of the street and public spaces is provided.
- Amenities such as parks and the coast can enjoy the greatest exposure and value-added amenity to the local community.
- Pedestrian amenity is enhanced during winter.
- The street network provides a variety of routes and choice particularly for vulnerable groups such as children, young women and the elderly.

Win-Win outcomes:

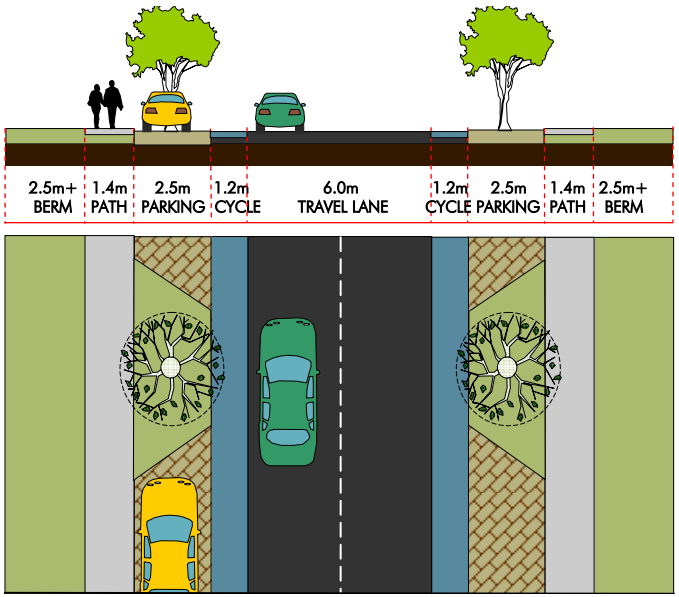
- The Council will support variations to a lot size and other requirements when a logical, better design and outcome is possible.
- The Council will consider supporting narrower road reserve and carriageways and alternative road typologies when the block structure avoids rear lots.
- The Council will consider applications that demonstrate the indicative location of dwellings and outdoor living spaces (directly adjacent but not to the south of units) in a manner that would avoid the need for future solid front fencing for privacy as having positive effects.

ROAD DESIGN

Carriageways, berms, cycleways, footpaths, car-parks, and sometimes stormwater infrastructure all need to share the road reserve. While roads need to be designed to cater for traffic and infrastructure services, they also have a large role in determining the character of the subdivision as a whole. Road widths, cycle-way, footpath styles, and berm location and width can all be used creatively to deliver variety, interest and identity into neighbourhoods.

Cul-de-sacs versus connected roads

Well designed, connected roads can provide the best features of cul-de-sacs - such as quiet traffic and safety for children playing near the road - whilst promoting accessibility. Roads last longer than buildings yet in the past have had little design attention.



TYPICAL COLLECTOR ROAD

Including dedicated cycle-lanes and accommodation of street trees within an on-street parking strip. These can be easily engineered into pits to assist storm water attenuation

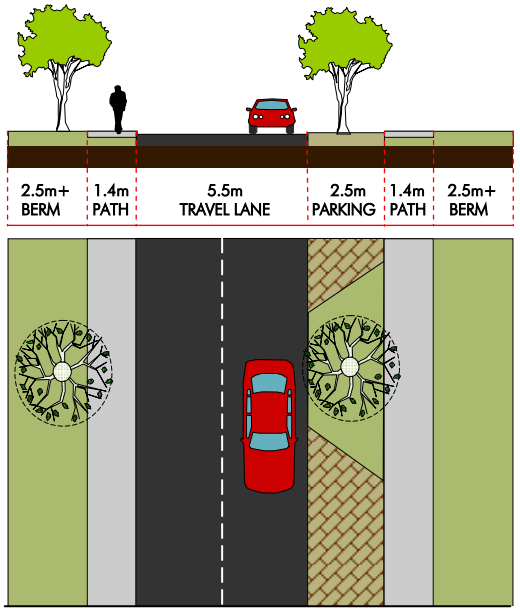
Design Elements

- Create identity for the neighbourhood through the design of quality roads
- Design for attractive roads, incorporating appropriate carriageway widths, landscaped berms and street trees, car parking, lighting and adequate footpaths.
- Design roads according to the anticipated traffic volume and desired vehicle speed. Determine the role of each route based on the wider environmental movement context, either as a local road or collector/ arterial road, and ensure the design is appropriate for that purpose
- Road design should encourage appropriate driver behaviour, reflecting the local purpose of many neighbourhood streets. Traffic calming can be achieved by carriageway widths, tighter kerbline radii, traffic islands (which can double as pedestrian refuges to assist crossing), localised narrowing, planting and changes to the street surface. Shorter distances between intersections also reduce vehicle speeds
- Narrower roads, where small traffic volumes are anticipated, help to slow and calm traffic, but they must have enough width for safe and efficient access for emergency services and service vehicles. Avoid situations where on-road parking blocks the movement of other vehicles, including 90-percentile trucks
- Ensure adequate eye-to-eye visibility is maintained for road users and pedestrians at intersections and driveways
- Design tight intersections to slow and control traffic. Intersections need to be designed for the safety of pedestrians, cyclists, and mobility scooters
- Roundabouts can be unsafe for pedestrians and cyclists and should only be used after other intersection designs have been explored

- Provide dedicated cycle lanes on roads with higher traffic volumes
- Footpaths should be provided on both sides of the road unless a clear case to the contrary exists
- Consider providing rear lanes or slip lanes for vehicle access and parking adjacent to heavy traffic routes, avoiding multiple driveways compromising the road's function
- Provide bus-stops on public transport routes and ensure that these stops are overlooked by adjacent housing and other activities. Ensure that every lot is within 10 minutes walk of a bus stop and adjust the road network to provide direct routes
- Avoid placing groups of dwellings on private ways, rights of ways, or common access ways. Common driveways don't provide the same amenity or privacy as roads

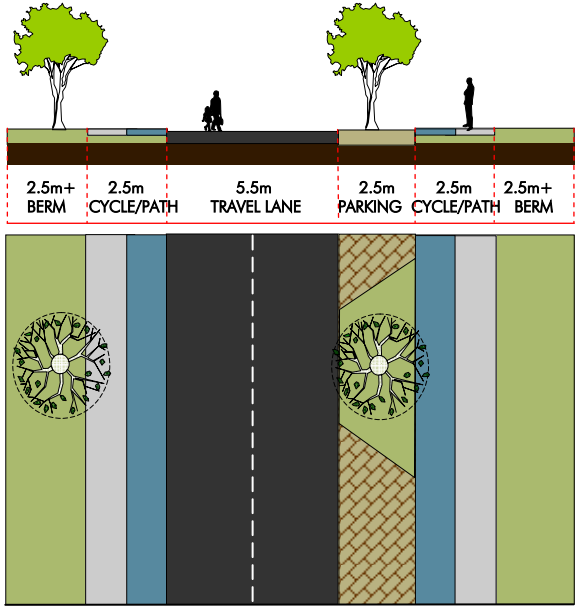
Benefits of this approach:

- Reduced traffic speeds where appropriate and improved safety for pedestrians, cyclists, and vehicles
- Use less resources and create less stormwater run-off
- Are more attractive, quieter, and friendlier roads
- Enables a greater sense of community



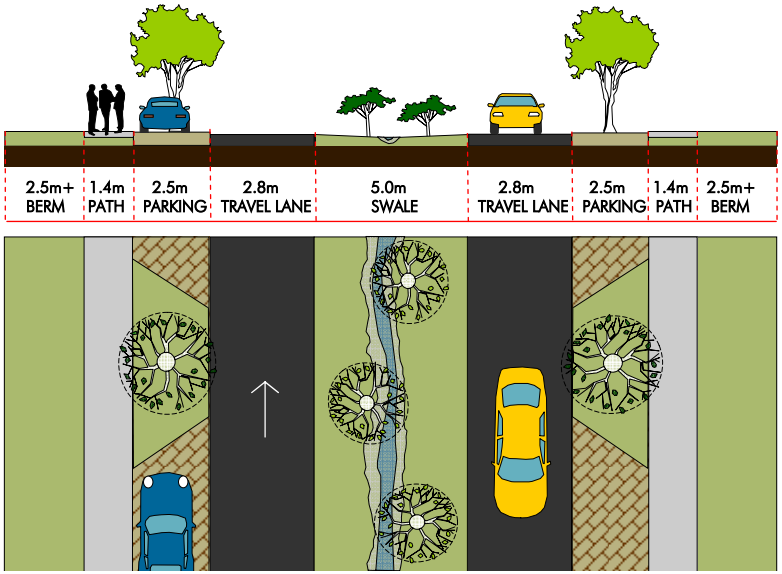
LOCAL ROAD WITH DEMARCATED PARKING LANE

Differentiated surface makes carriageway feel narrower inducing slower vehicle speeds. The co-location of street trees within this strip creates greater space efficiencies allowing a narrower road reserve.

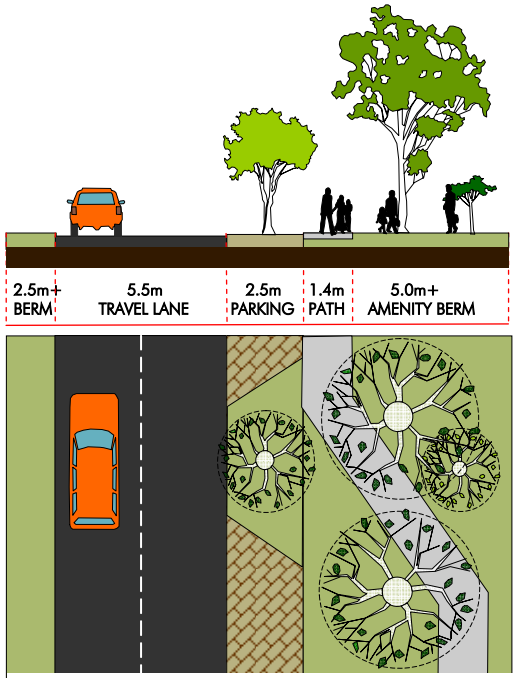


LOCAL ROAD WITH INTEGRATED CYCLE LANE / FOOTPATH

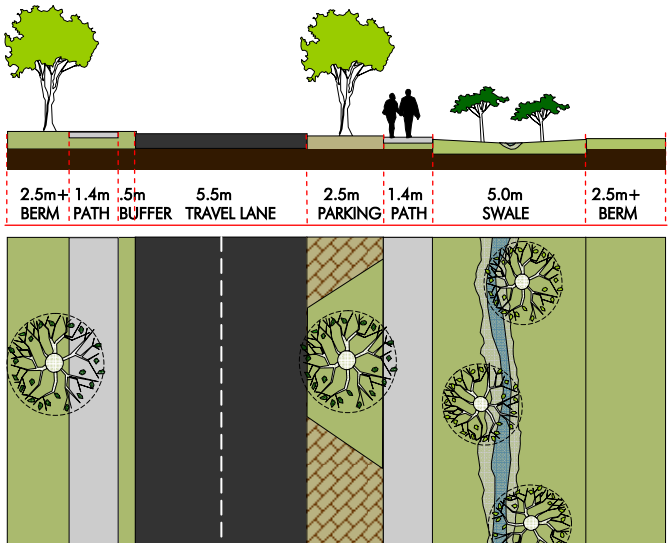
Including 2.5m wide surfaces divided by colour or a painted strip that allows an efficient mode-share and (depending on the frequency of cycle use) a very high amenity footpath.



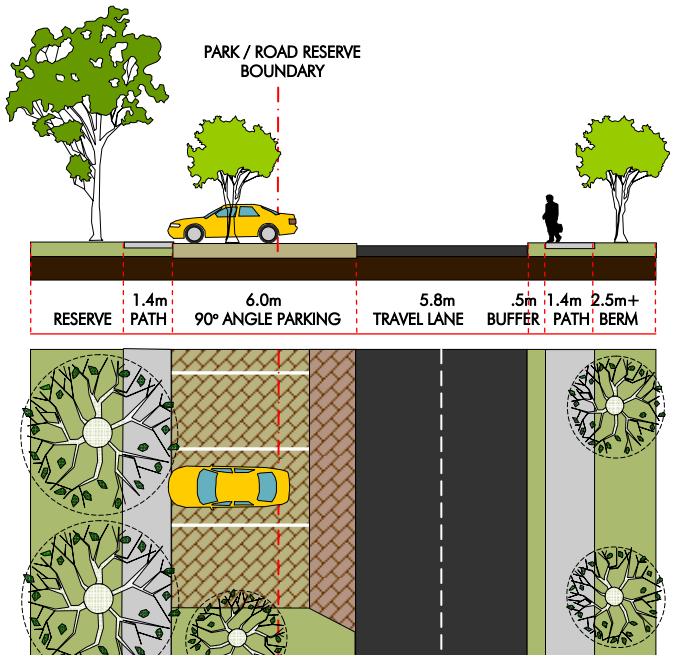
ROAD WITH CENTRAL SWALE



ROAD WITH BERM-BIAS FOR AMENITY



ROAD WITH SWALE TO THE SIDE OF CARRIAGEWAY



ROAD SHARES CAR-PARKING WITH LOCAL RESERVE

Win-Win outcomes:

The Council will support innovative road designs and widths when they:

- Maintain the purpose and function of the road network, providing a variety of routes through the neighbourhood and adequate provision for pedestrians and cyclists
- Maintain adequate widths for vehicle manoeuvring and access (with the road and from driveways), on-street car parking and berms with footpaths and street trees
- Ensure that berms provide adequate width to allow street trees to grow to maturity.

The Council will support footpaths on only one side of a road when:

- There is no development planned to front that side of the road
- Topography or vegetation precludes provision
- The road serves less than 20 dwellings
- Vehicle speeds are very slow
- The road does not connect to other land uses with a high volume of pedestrian traffic
- Where a road fronts a park, it can be more appropriate to allow a footpath to meander through the open space than run parallel with the carriageway

TRAFFIC CALMING

The management of vehicular movement to maintain amenity is an increasingly important aspect of movement networks. This is because the efficient through movement of traffic needs to be reconciled with the need to provide safe, high-amenity settings for residential areas.

A range of techniques exist ranging in significant to very small-scale 'spot' treatments to manage the flow of vehicles.

Design Elements:

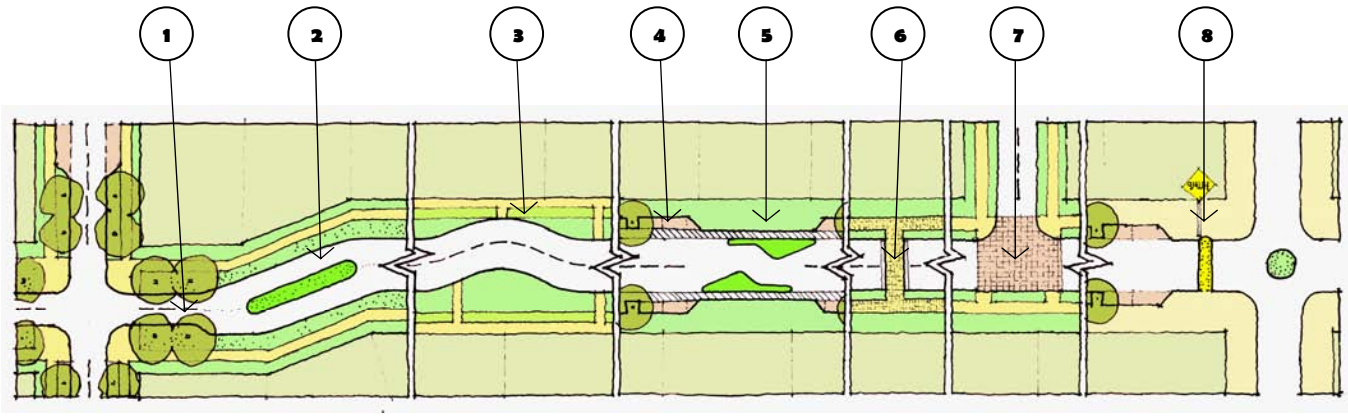
Design interventions include:

- Delineate different mode space with different materials - use colour and material to make vehicular carriageway, footpaths and cycle ways, parking bays and manoeuvring areas clearly legible
- 'Tighten' intersection corners to ensure slower vehicle movements (1)
- Look to incorporate islands or raised berms as they can be used for landscaping or to help aid pedestrian crossing as well as slowing vehicles (2)
- Avoid long stretches of straight local residential roads by using the road reservation width to allow for regular bends or 'shifts' in the carriageway (3)
- Incorporate chicanes or 'chokers' at key points to slow movement. The use of mountable kerbs can allow wider radii for large and emergency service vehicles (4)
- Incorporate landscaping into parking bays to help make the carriageway seem psychologically narrower to drivers (5)
- Develop tables (essentially large, flat speed humps) with material differentiation to aid pedestrian crossing without relying on formal crossing points (6).
- Raising intersections and using material differentiation can make these points more prominent while helping to slow vehicles (7)
- Speed bumps (up to 1.0m wide) or humps (essentially a long speed bump up to 4.0+m wide) can also effectively manage vehicle speeds (8). However due to the nuisance they can create for adjacent users these should be considered as representing the least desirable form of intervention.

For more information on traffic calming techniques, visit www.trafficcalming.org

Benefits of this approach:

- Better management of traffic speeds at key 'conflict' points with other modes (pedestrians, cyclists etc.)
- Personal safety benefits
- Greater local amenity especially for residential land uses



Win-Win outcomes:

- The Council will consider supporting narrower road reserve and carriageways and alternative road typologies when the movement network includes appropriate traffic calming techniques
- The Council will include traffic calming measures around parks, main pedestrian or cycle network crossing points, and local shops / services as positive effects when considering applications for consent.

ON ROAD CAR PARKING

The District Plan requires off-street parking to be provided for every dwelling. There is also a demand for some on-road parking for visitors and short-term parking. This parking needs to be provided in a manner that maintains the amenity of the street.

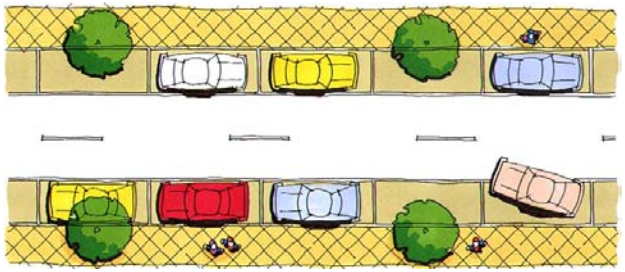
Design Elements:

- Parallel kerbside parking evenly distributed throughout the subdivision is good for visitor and resident parking
- Parking can be concentrated alongside parks to promote public use and to relieve parking in nearby residential roads
- Parking bay materials to contrast with traffic lanes and make the streetscape more appealing (as well as reducing vehicle speeds)
- Where parking bays are provided, prevent driveways from crossing the bay and negating the function of the space
- Be aware of facilities that may have parking congestion issues at particular times
- Ensure street-trees have sufficient area to grow

On-road parking is essential for visitors. Deep blocks including rear-lots can result in an over-demand for these spaces causing problems for emergency services and residents needing to manoeuvre over the carriageway.

Well located parking bays incorporating landscaping can significantly improve the amenity of a street as well as helping manage vehicle speeds.

Formed on-road parking bays can be undermined by inconsiderate placement of vehicle driveways and garages. Lost parking bays cannot be easily replaced once the roadway has been formed.



Benefits of this approach:

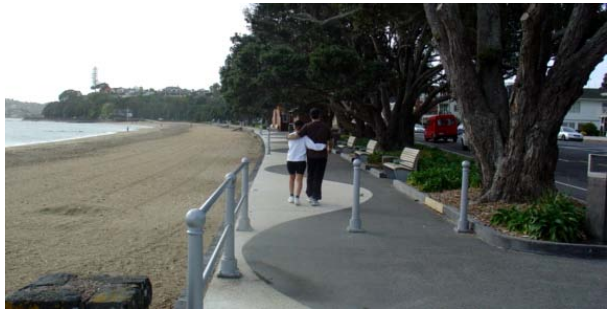
- It is cost-effective by allowing for multiple use (including landscaping).
- Surface treatment for parking areas helps make the carriageway seem narrower, reducing traffic speeds.
- Is convenient.
- Provides a greater presence of people in the street.
- Provides natural traffic calming.

Win-Win outcomes:

- The Council will support a design for on-street parking bays when their layout and distribution is based on a logical pattern of 'best use'.
- The Council will support a reduced provision of on-street parking bays when the design and movement logic supports this.

PEDESTRIANS AND CYCLISTS

The provision of footpaths and cycleways enables and encourages people to walk and cycle around their neighbourhood. This facilitates social interaction and casual contact between residents, and an active, safer road. Quality design for pedestrians and cyclists can help make non-vehicle local trips viable, reducing energy consumption, pollution and traffic congestion. This in turn can result in health benefits. Safe roads can also make it attractive for children to walk and cycle to school.



The highest quality walkways should be adjacent to the highest quality settings.

Dedicated walkways or cycleways offer greater choice to these users and if integrated with the roading network can provide district wide routes.

Design Elements:

- All roads should be designed to cater for cyclists and pedestrians, including children, the elderly, the disabled, and parents with prams
- Intersections should provide pedestrian crossing points
- Separate cycle and pedestrian paths may be appropriate where an attractive longer route can be achieved without intersections - e.g. along an esplanade reserve
- Footpaths take precedence over vehicle crossings - the gradient and material of the footpath should be uninterrupted
- Walkway and cycleway links, between roads, should be at least 6m legal width. To ensure user safety, their location should be integrated with street lighting and landscaping and also provide clear visibility from both ends. The placement of street trees also is important as trees can over time block light and visibility
- Consider where schools, sports uses, and other facilities are located to determine where walkway and cycleway connections are optimally suited

Strategies such as walking school buses work best when supported by a high-quality backdrop of pedestrian friendly roads and linkages (image source: www.freofocus.com).

Where appropriate a shared walk/cycleway can offer greater amenity for users of both mode than can otherwise be the case, predominantly through having greater space for the majority of a journey.

Benefits of this approach:

- Increased pedestrian and cycle activity, and reduced vehicle dependence for local trips.
- Actively used integrated routes are safer.
- Social, health and environmental improvements (less energy consumption, less emissions).
- The quality settings necessary to enable success in other strategies (for example such as walking school buses) are established.

Win-Win outcomes:

- The Council will consider the provision of good walkways and cycleways as a positive effect when considering applications.
- The Council will consider the provision of good walkways and cycleways as positive effects when considering consent applications

2.4 Neighbourhood Design

ACCESS TO COMMUNITY SERVICES AND FACILITIES

Residents require access to community facilities in order to meet their daily needs, and to participate in community activities. Where community services and facilities (such as shops, schools, libraries, and health facilities) already exist, new subdivisions should be well connected to them with a logic based on providing convenient access.

Facilities within walking distance of residents can encourage walking and reduce the use of motor vehicles. This also allows those who are non-drivers (children, the elderly, and those with disabilities) opportunities to independently access community facilities.

Opportunities for residents to work locally will minimise travel distances and avoid creating dormitory suburbs, as well as strengthen the economic and general vitality of town centres. This is easier as emerging trends highlight the increased suitability of remote, small workplaces and home-offices. Neighbourhoods should avoid being mono-cultural residential suburbs by providing for a range of business activities close to where people live.

Design Elements:

- Take advantage of strategic locations adjacent to collector roads and intersections to develop local centres containing retail, service, employment, education, and community facilities
- Consider providing sites for the development of child-care facilities
- Look to stimulate the provision of new facilities if none exist in the local environment

Communities cannot develop unless residents are able to conveniently access local facilities.

Benefits of this approach:

- Opportunity to meet day-to-day needs locally.
- Facilitates greater social interaction.
- Encourages walking, cycling, and reduces dependency on motor vehicles.
- Helps establish greater viability and use of local facilities.

Win-Win outcomes:

- Local centres and passenger transport corridors offer opportunities for higher density subdivision and development. These opportunities should be explored with the Council.
- Subdivisions that seek to strengthen existing community services through connectivity or direct involvement (cash or resource donations) will be considered by the Council.
- The Council will support 'out of zone' uses when a compelling urban-design based logic exists.

OPEN SPACES

Parks and open spaces are important elements of a neighbourhood. They provide opportunities for recreation and social contact, and their spaciousness contrasts with the built form of urban areas.

They also critically offer a protected view for surrounding sites that if marketed well can add value through their guarantee of never being built-out.

The manner in which a subdivision relates to public spaces such as roads, parks, and streams is very important for visual amenity and safety. Too often parks are inconveniently located, inappropriately sized or poorly overlooked, being comprised of left-over land from the lot design process.

Design Elements:

- Locate open spaces where they are highly prominent and accessible within the local area
- Open spaces should be located within walking distance of all allotments, positively contributing to residential amenity. Typically aim for no more than 400m of actual walking route distance, but 200m wherever possible
- Provide open spaces based on what type of space would add the greatest value to the neighbourhood. In some instances, high quality ecological corridors or pedestrian linkages are more desirable than neighbourhood reserves if there are existing ones (or similar spaces that can offer the same services) close by.
- The number of parks and open spaces in a neighbourhood and their amenities need to be based on:
  - The needs of the community reflected by population density and demographics
  - The types of users and their requirements
  - The participation rates for selected activities
  - Use and access to existing facilities, and gaps in amenity provision
  - Opportunities for dual purpose functions (active and passive recreation)
- Parks should not be made of 'left-over' land. The location and design should be informed by the neighbourhood context and site analysis.
- Use open spaces as a design feature, adding value to the lots
- Parks should be highly visible and be bounded by as many roads as possible - with dwellings fronting them - providing informal surveillance, making them safer.
- Locate and design parks to take advantage of existing trees and features of interest (natural and cultural), adding identity to the neighbourhood

TYPE OF SPACE:	SIZE AND FUNCTION:	LOOKS LIKE:
regional park	Greater than or equal to 6 hectares. Users travel to visit these parks and they are valued for their significance, uniqueness, and heritage. Can include wetlands and coastal areas.	
sports field	Minimum 1 hectare. Preferably greater than 2 hectares. While an ideal situation would be an area that is large enough to accommodate at least 2 fields (plus room for facilities such as changing rooms) in some cases an area that can reasonably contain one field is acceptable.	
local reserve	2000sqm to 6 hectares, with road frontage. Generally used to fulfil passive recreation needs of locals. Includes children's playgrounds.	
pocket park	Less than 2000sqm. These parks are generally designed to break up an urban form and to mitigate intensity of development. May include children's playgrounds.	
green linkages	No minimum or maximum size. Includes ecosystems, river and stream corridors, bird corridors, esplanade reserves and riparian areas.	

OPEN SPACES continued...

Design Elements:

- Investigate opportunities to connect with other open spaces to form a network
- Provide walking and cycle paths through an open space network, connecting with adjacent streets
- Provide amenities within parks, including children's play equipment, landscape areas for passive recreation, public art and flat land for active recreation
- Ensure the design of parks takes into account future maintenance requirements and costs
- On-road car parking should be provided adjacent to all parks
- Avoid creating spaces, pedestrian linkages, or cycleways that are located between the 'backs' of adjacent sites. These will invariably be less safe. If this is the only option include mechanisms to ensure there are no high fences

Benefits of this approach:

- Accessible, overlooked open spaces are safer and will be better used.
- Valued by the community.
- Increase the value of the subdivision, particularly of adjacent properties.
- Open space networks provide alternative movement networks.
- Enhance local character and identity.

Win-Win outcomes:

- The Council will consider supporting smaller-than-required reserves when the proposed subdivision has a clear benefit in terms of location and quality relative to the overall subdivision. *Quality means much more than quantity.*
- Innovative designs for smaller parks may be considered where they satisfy the following criteria:
  - They are located at logical, highly prominent and visible parts of the subdivision.
  - Are of an adequate size to meet the identified needs of residents.
  - Are accessible.
  - Provide additional amenities such as children's play equipment, appropriate planting, and seating.
  - Are fronted by roads and can be overlooked by houses across the roads.
  - Are part of an open space network or adjoin existing parks or parks proposed as part of a neighbouring subdivision.
- Adjoining landowners are encouraged to work together to develop open space networks that respond to the natural environment and the needs of future residents.

Explore public/private provision of open space to reduce the maintenance burden.

This reserve has been located to the rear of lots. This makes it poorly visible from the street for users, lowering its potential use and overall community utility. It's location relative to lots mean that for privacy it is generally lined with solid fencing. This means that it feels less safe and the value it adds to adjoining lots is not optimised.

This reserve has been located at the most visible and prominent part of the development, making its presence immediately obvious to all. Land uses front directly onto it making for easy casual surveillance. This also helps give the development a sense of openness on arrival for visitors, helping to add-value for all lots within.

Landscaping and street trees can add definition to the street-scape and helps frame important views and vistas.

LANDSCAPING AND STREET TREES

The standard and appearance of street trees, plantings, paving, walls, fences, seats and other structures play an important role in establishing the identity, quality, amenity, visual interest and character of a subdivision.

Design Elements:

- The streetscape should reflect the functions and characteristics of the road type in the network.
- Incorporate existing significant vegetation where possible.
- Ensure that the landscape is sensitive to the character of the neighbourhood and preserves important views and vistas.
- Provide street trees generally at 10 metre centres, located to avoid interference with services, driveways and parking bays. Avoid locations where they will need to be removed at a future date.
- Provide adequate grass berms or tree-pits to allow the trees to grow to maturity. This may mean locating the street tree adjacent to the lot boundary.
- Ensure the species is well suited to local conditions, being tolerant of wind, frosts, droughts, wet conditions and salt spray, and are easily maintained.
- Ensure the trees have an appropriate height and canopy for the location, width of street, and for ongoing maintenance. Use larger trees on wider streets to create the impression of an avenue. Avoid low shrubs that block sightlines of pedestrians and vehicles.
- Use locally sourced indigenous trees to enhance biodiversity. Contact the Council for further guidance.
- Hard-landscaping (paving areas etc.) is robust and designed as an option that does not place an onerous long-term maintenance liability on the Council.
- Coordinate planting with seasonal and subdivision development / completion timings in mind.

Benefits of this approach:

- Enhance the visual amenity of streets and parks, encourage walking and cycling.
- Provide shade in summer and where deciduous, solar access in winter.
- Contributes to habitat networks for local and migratory fauna.

Win-Win outcomes:

- The Council will include the value of significant streetscape landscaping and planting (e.g. quality specimens, specially designed rootzone areas or tree pits etc.) as a positive effect when considering applications.
- The Council will consider including the value of exceptional street landscaping towards any required reserve contribution.

2.5 Infrastructure

STORMWATER MANAGEMENT AND LOW IMPACT DESIGN

Stormwater run-off within a catchment must be carefully managed in order to avoid (often cumulative) problems of flooding, erosion and pollution of water bodies. Stormwater systems should attenuate stormwater flow and optimise interception, detention, and removal of waterborne pollutants from urban run-off prior to their discharge to receiving waters.

If stormwater disposal is managed in a sustainable manner, the impact on the environment is less and longer-term maintenance costs are reduced. Stormwater management can provide attractive amenity features within and adjoining subdivisions.

Paved surfaces should be carefully controlled to reduce the extent of impermeable surfaces and resulting increases in stormwater run-off. Historic engineering practices have led to some local roads having carriageways with widths of 11 metres or more. However utilising narrower carriageways and semi-permeable paving for on-road parking help to reduce impermeable surface. Swales and larger grass verges can allow groundwater recharge, slow the movement of water, and reduce pollutants in receiving water bodies.

Benefits of this approach:

- Reduces the size and cost of reticulated networks.
- Recharges ground water and reduces peak volumes of stormwater discharged to streams or the coast.
- Treats stormwater, removing sediment and contaminants.
- When integrated with parks contributes towards the open space needs of new development.
- Helps reduce the need for upgrades to District infrastructure treatment plants
- Offers habitat opportunities for bird and aquatic life.

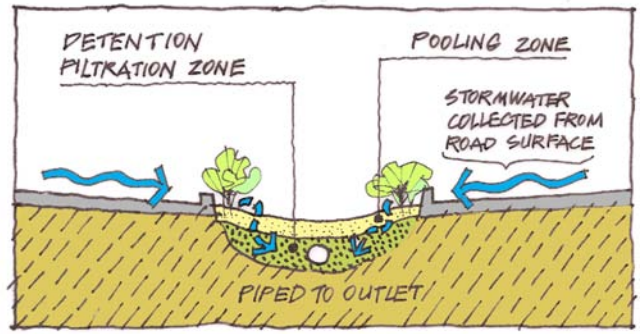


Diagram of a typical swale with photograph.

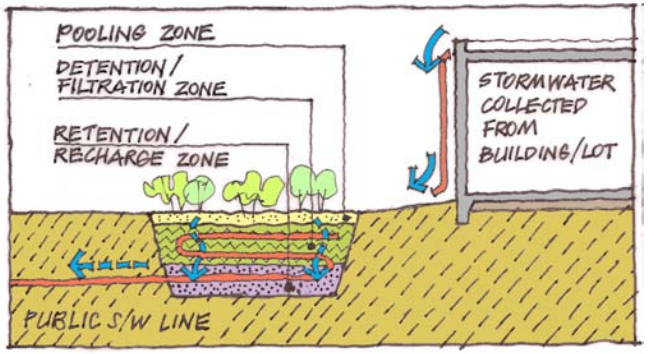


Diagram of a typical rain garden.

Design Elements:

- Ensure that post-development flows are restricted to pre-development levels using a variety of 'treatment train' stormwater methods within lots and throughout the drainage network
- Reduce stormwater discharge to reticulated networks by the use of street-edge swales and rain gardens to collect stormwater run-off from paved surfaces
- Improve the quality of stormwater before it reaches streams by allowing it to flow over grass areas (such as swales) and through constructed wetlands
- Consult with an engineer as to the most appropriate solutions to address the site's topography, soil types and ability to dispose of stormwater through groundwater recharge and soakage
- Encourage the detention and re-use of stormwater within each lot. Rainwater harvesting from dwelling roofs can significantly reduce the amount of stormwater discharged during storm events
- Encourage single car-width driveways and vehicle crossings, reducing impervious surfaces
- Carefully design wetlands and ponds to avoid water quality problems
- Carefully select vegetation as some can become weedy and choke waterways
- Ensure permeable 'hard' landscaping solutions

Stormwater 'slowing' techniques offer a range of benefits to the local environment, from the ecological, to social and even economic (in terms of increased property values).

Requiring on-site techniques to manage stormwater can cumulatively provide substantial relief to the District's primary infrastructure.

Win-Win outcomes:

- Requiring residents to install on-site stormwater detention and quality measures can reduce the capital cost and land requirements of centralised stormwater ponds and wetlands.
- The Council will consider a reduction in stormwater development contributions when low impact stormwater design is incorporated into developments.

3 INDIVIDUAL LOT CONSIDERATIONS

- Active street frontages
- Lot design

3.1 Active Street Frontages

People wish to live in environments where they feel safe and secure. Subdivisions, and particularly the public spaces within them, should be carefully designed and managed so that both the fear of crime and the actual incidence of crime is reduced.

Conventional responses to this market demand focus around gated and 'fortress' communities. These can in fact reduce interaction and familiarity between neighbours. Research shows that counter-intuitively, they can even reduce safety through the isolation and screening of crime targets. Too much privacy and screening and a lack of regular disturbance (such as passing cars) can make sites very vulnerable to invasion.

Passive surveillance of public spaces is one effective deterrent. Achieving this requires attention to both the subdivision layout and to the elements of the residential environment such as lighting, fences, planting and the relationship of houses and windows to the roads and public spaces.

Design Elements

- Design lots so that future dwellings can locate their front door and a living room fronting the road - improving the character and safety of the neighbourhood
- Provide a parallel slip-lane where direct access off an arterial road is not achievable, allowing buildings to face the road and maintain passive surveillance
- Manage 'fronts and backs' between lots, roads, and spaces
- Avoid the development of rear lots
- Incorporate the principles of Crime Prevention Through Environmental Design (CPTED) in the design of subdivisions.

This footpath is overlooked, suitably landscaped with a low level front wall and planting.

The front door and living room have a direct connection to the road environment.

The garages have been set back behind the main face of the dwellings, avoiding their dominance of the road.

Benefits of this approach:

- More attractive, visually coherent neighbourhoods.
- More contact between residents and opportunities for social interaction.
- Safer environments.
- Reduced 'fortress mentality' approach to development.

Win-Win outcomes:

- The Council will strongly support layouts that avoid 'front and rear' conflict between lots, roads, and other spaces.
- The Council will strongly support applications that include mechanisms that will 'lock in the quality' from future development.

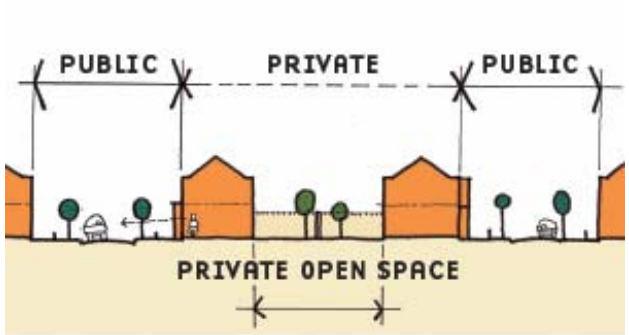
3.2 Lot Design

With simple design, lots can be oriented to enable residents to capitalise on views, take advantage of solar access and minimise the discomfort of solar access and prevailing winds. The layout of lots should provide for a mix of housing types, lot sizes and densities, with smaller lots and higher densities close to centres and passenger transport.

This promotes housing choice and diverse neighbourhoods. A mix of lot sizes assists in introducing more innovative forms to develop (e.g. zero lot boundaries or semi-detached housing).

Design Elements

- Provide lots with sufficient area and dimensions to meet user needs. Ideally lots should be rectangular in shape, with dwellings located at the front by the road to allow the development of adequate and private back yards
- Arrange lots to front roads. Avoid developing rear lots within a block. These reduce the privacy of adjacent sites and increase the depth and size of the block
- Design urban blocks for lots to have 'fronts facing fronts' and 'backs facing backs'
- Orient lots to ensure sheltered microclimates can be delivered, receiving adequate winter sunlight in outdoor and indoor living spaces
- Ensure there is a variety of different sized lots, creating a diverse community, rather than catering for only one residential market



The ideal urban block section, clearly demarcating the public and private realms.

This layout illustrates how all lots front the public street and how solar gain is provided in all private open spaces.

Benefits of this approach:

- Sunlight access and outlook for future dwelling.
- Meeting the diverse living needs of the community.
- Encourages the integration of more intensive housing close to town centres.

Win-Win outcomes:

- Opportunities for increased lot densities will be supported where subdivision:
  - Is within a direct walkable distance of 500 metres from a town centre or 250 metres from a local centre that is on a public transport corridor.
  - Provides improved onsite amenity corresponding to the increase in density.
  - Improves street connections and accessibility.
- Include intended or recommended building platforms of appropriate size and vehicle crossings on each lot of the scheme plan to demonstrate how the lot has been designed around delivering a quality outcome.

4 LOCKING IN QUALITY

Available tools

4.1 Available Tools

There are a number of mechanisms available to the Council, developers, and interested parties (through consultation or sub-missions) to ensure that the design elements of the subdivision are implemented and maintained over the life-time 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:
  - Ensure the dwelling fronts and relates well to the road.
  - Locate garages a specified distance back from the front façade.
  - Minimum architectural / building quality standards.
  - Require a specific amount of glazing from a living or dining room face the street without obstruction.
  - Involve an entry statement that stands out from the front façade 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.
- Provision of on-site manoeuvring.
- 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

MAINTENANCE

The design of subdivision should include consideration of the maintenance requirements and the whole-of-life costs of any public or private infrastructure or facilities.

The ongoing quality of a neighbourhood is dependant on good design choices, robust materials and infrastructure and a cost-effective maintenance regime.

Private amenities can often be managed through a body corporate or home owner association.

OTHER REFERENCES TO HELP INFORM DESIGN QUALITY:

The following resources will additionally help provide assistance with delivering good-quality subdivisions:

- Kapiti Coast District Council - Subdivision and Development Principles and Requirements & Supplementary Guidelines
- Ministry for the Environment - People+Places+Spaces
- Ministry for the Environment - NZ Urban Design Protocol & Supplementary Publications
- Ministry of Justice - NZ CPTED Guideline
- Kapiti & Horowhenua Environmental Guidelines
- Kapiti Coast District - Growing Native Plants in Kapiti
- Auckland Regional Council - Technical Publication No. 10: Stormwater Management Devices & Guidelines
- New Zealand Water and Wastes Association - www.nzwwa.org.nz

5 PUTTING IT ALL TOGETHER

The principles presented within this guideline aim for the 'perfect' scenario. In reality, it may not be possible to achieve this outcome for all areas.

The following case-study illustrates a 'before' and 'after' scenario where the principles advocated within this guideline can typically inform and improve the quality of subdivision.

The example is an actual development from a coastal setting within the North Island, that has issues very similar to those experienced within the Kapiti Coast, in particular the 'lumpy' dunal landform and watercourses that are ecologically relevant.

The exercise identifies a number of the practical issues that can arise with conventional subdivision. It also identifies how these can be overcome through design quality.

KEY DESIGN ELEMENTS:

Average lot size - 600sqm

1.) Existing roading condition precludes direct vehicle access to individual lots. Internal access from Right of Ways results in properties 'backing' onto the main road, which will likely result in solid fencing creating a poor interface.

2.) Lack of any sense of 'street' or frontage for many lots.

3.) Many lots accessed solely by minimum width ROW - no pedestrian connections to street for residents or visitors.

4.) Lots 'back' onto reserves, which will likely result in solid fencing creating a poor interface.

5.) Poorly integrated open space to main road, solid fencing likely.

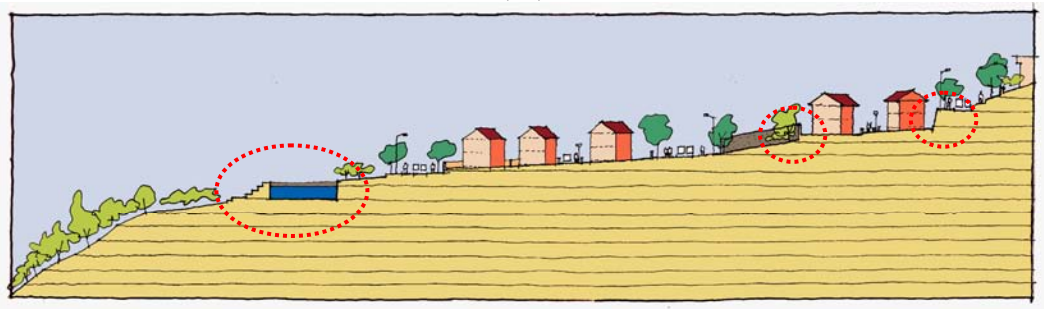
6.) Heavily engineered stormwater pond.

7.) Entrance point from Main Road located poorly in relation to road curve and sightlines.

8.) Lack of future connections for adjacent sites.

No measures beyond Council-imposed conditions put forward to lock-in future quality.

Long Section showing areas of significant excavated cuts (red)



"BEFORE" - the conventional approach

KEY DESIGN ELEMENTS:

Average lot size - 550sqm; does not materially affect the 600sqm average size target market for this 'product'.

1.) Worked with the Council to improve road interface and allow access to the Main Road. Good frontage now possible at this critical interface.

2.) Clear demarcation of fronts and backs for all lots providing a sense of 'street frontage'.

3.) Limited use of right of ways and cul-de-sacs to maximise site penetration for lots.

4.) Reserves have a clear sense of frontage and surveillance.

5.) Open space is integrated with main road through shared use of public lane giving width and surveillance for pedestrians.

6.) Stormwater pond designed around existing contours to reduce earthworks.

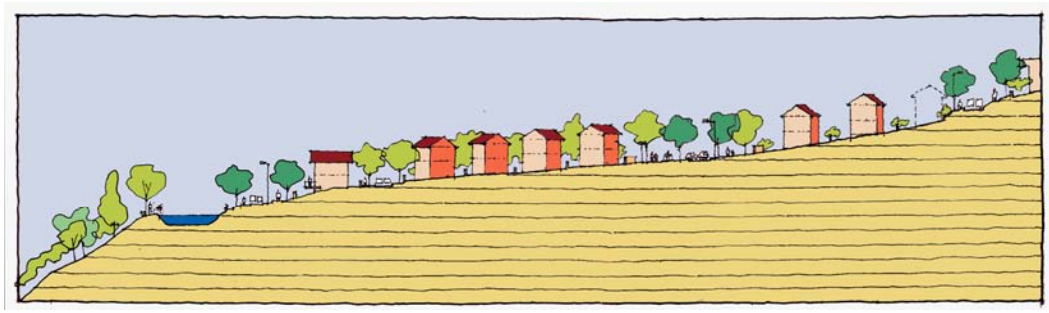
7.) Entrance point from Main Road moved away from road curve to improve sightlines.

8.) Future connections for adjacent sites provided to boundary.

Measures put forward to lock-in future quality:

- Covenants over fence height and dwelling interface (garage recessed behind dwelling; glazing from a loving room fronting the street; clearly legible front doors) to maximise sense of frontage and public realm interface.
- 'Spot' covenants on key sites ensuring main glazing provides surveillance over potential conflict areas ('S')

Long Section showing reduced need to modify the landform



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