LOCAL PATH DESIGN GUIDE

LEAN VERSION

Auckland Council

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CONTENTS

PART ONE
OVERVIEW

1.0
INTRODUCTION

Building a connected Auckland is an essential part of creating the world's most liveable city, and an Auckland Paths network is creating walking and cycling connections across the region. Central to the concept of Auckland Paths is that they are designed to provide 'active transport' options, appealing especially to those in the community that may not be comfortable cycling or walking on streets where cars are prioritised.

Local Paths

Local Paths consist of quiet streets with slow-moving vehicles plus routes through parks. These routes safely connect communities to local destinations such as schools, town centres, public transport stops, and recreation spaces, and extend accessibility to the wider cycle network.

Walking or cycling for short local trips instead of driving can reduce the stress on the transportation network, support local businesses, provide wider health benefits and help to create more connected communities.

Equally as important, Local Paths provide a range of opportunities to enhance Auckland's natural environment and for local communities to reflect local identity, pride and connection to place.

This Guide

The Local Paths Design Guide is organised into three parts. It defines what a Local Path is and what it isn't, and illustrates how they connect to Auckland's wider transport network.

Part One provides key performance standards and design principles based on international best practice that can be used to both develop and evaluate future Path projects.

Part Two outlines a step-by-step guide describing how the Paths network could be designed and planned.

Part Three describes a wide range of tools from planning through to community engagement and the application of physical infrastructure for streets.

1.1

WHAT IS A LOCAL PATH?

Local Paths use a combination of design treatments to reduce both the number and the speed of cars, provide design priority for people riding bicycles, and also improve the conditions for walking. Local Paths benefit the wider bicycle and pedestrian network by connecting up to longer distance routes such as Express Paths, typically located along arterial roads. Local Paths can also be created by connecting streets to park routes and trails. The following page (page 7) show how Local Paths fit into related transportation and recreational networks. The Auckland Paths network is comprised of the following:

Express Path

Express Paths are cross-city connections that provide for both walking and cycling separated from vehicles. They provide for faster movement than Local Paths and create links to regional and local centres.

Local Paths

Local Paths are both on and off-street, and are designed to create safe and pleasant neighbourhoods that encourage walking and cycling for local trips. The naming of these paths provide the opportunity to reflect local places, names, land marks and connection to mana whenua.

An on-street Local Path has pedestrians accommodated on footpaths with streets that are safe enough to cycle on without the need for separated cycle lanes. Traffic calming tools, pavement markings and signage are used to improve safety for all street users.

Off-road Local Paths run through parks and open spaces and accommodate both cyclists and pedestrians. Together with on–street Paths, they are designed to create linkages to local centres, parks, schools and transport links including Express Paths.

Trail

A trail is distinct from a Local Path in that it is found in rural or bush settings and is primarily for recreation. Many trails will connect to Local or Express Paths, but may also allow for horse-riding alongside walking and cycling. A trail can also be a bush walk, which due to topography would not be shared by cyclists. Trails are not generally intended to form a connection between destinations, and often run in loops.

Footpath

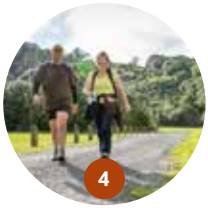
A standard pedestrian-only path along most streets, which is not accessible for cyclists.

Positioning Local Paths in Auckland's Walking and Cycling Network

Beach Road Cycleway

Sandringham, Auckland

Mount Roskill War Memorial Reserve



Mahurangi East Track

1.2
DESIGN PRINCIPLES

Primarily, Local Paths must meet the needs of all people walking and cycling. The design framework is based on the following principles: they must be safe, connected, accessible, comfortable and enabling.

Safe

Safety and a stress-free environment are core tenets of achieving a successful Local Path. Conflict points such as high vehicle numbers and high speeds should be minimised by providing a consistent level of experience across the Paths network. Crime prevention and enhanced social safety are also key outcomes of well-designed Local Paths.

Connected

Local Paths should connect destinations such as residential neighbourhoods, schools and universities, town centres, transit stations, and bicycle facilities. They should seamlessly connect to the wider transport network including Express Paths. Additionally, these connections should be designed to be easily navigated. Where intuitive design is unachievable, clear and consistent way finding signage should be employed.

Accessible & Comfortable

Paths infrastructure should be accessible for all users, including children and people with disabilities. Considerations include ample width, gentle gradients, smooth transition in surfaces, and avoidance of high volumes of traffic that create fumes and noise.

Enabling

Iwi, local community and stakeholders should be engaged early in the process to incorporate Te Aranga principles and community driven initiatives. Local Paths should integrate with the existing streetscape and celebrate Auckland's unique character by responding to and incorporating elements of the surrounding natural and built environment, heritage and culture. Opportunities to include ecological function through planting, water sensitive design, and low energy/low toxicity materials should be integral to each Local Path design.

1.3
PERFORMANCE STANDARDS

In addition to the design principles, the following performance standards provide quantitative and measurable benchmarks to guide Paths design:

- Vehicle Volumes
- Vehicle Speeds
- Bicycle Speeds
- Arterial Road Crossings
- Accessibility & Safety
- Green Infrastructure

Vehicle Volumes

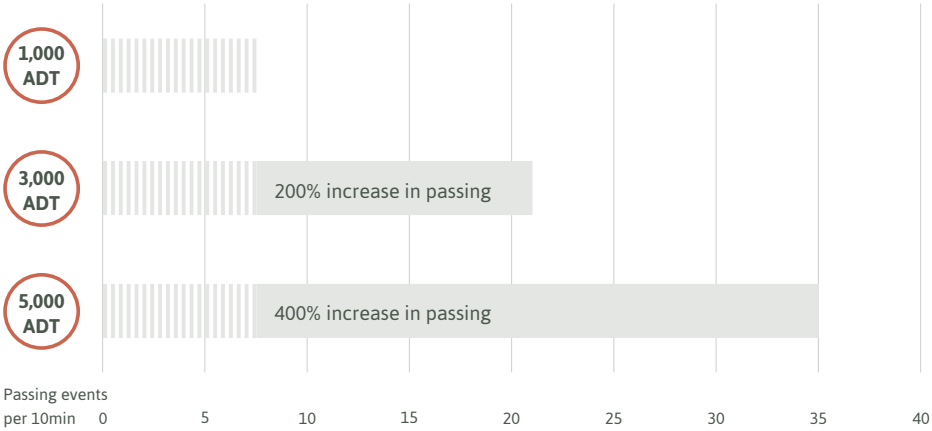
Local Paths should be designed, built and maintained for a maximum average of 2,000 vehicles a day.

A higher number of vehicles results in vehicles passing people on bikes more often and adds challenges to street crossings. This exposure to traffic increases the risk of collision and creates a higher stress environment for people walking and cycling while decreasing the likelihood that neighbourhood streets will be used by risk intolerant users.

Minimising traffic intensity and the corresponding exposure of cars to people on bikes is critical to designing safe and attractive Local Paths.

Ideal: 1,000 Average Daily Traffic (ADT) or less
Acceptable: 2,000 ADT maximum

Effects of vehicle volumes on the number of times a person cycling will be passed by a car going the same direction during a 10 minute trip



Values shown assume a 30 km/h posted speed. Local street peak hour is 15 percent of ADT. 70 percent of peak hour traffic is in the peak direction. Cars are evenly spaced along the street; no platooning. 10-minute trip calculated during peak hours. Cars are travelling the posted speed limit (speed management techniques may be necessary). Note: Cars may pass people cycling more or less frequently depending on how well these assumptions reflect reality.

Vehicle Speeds

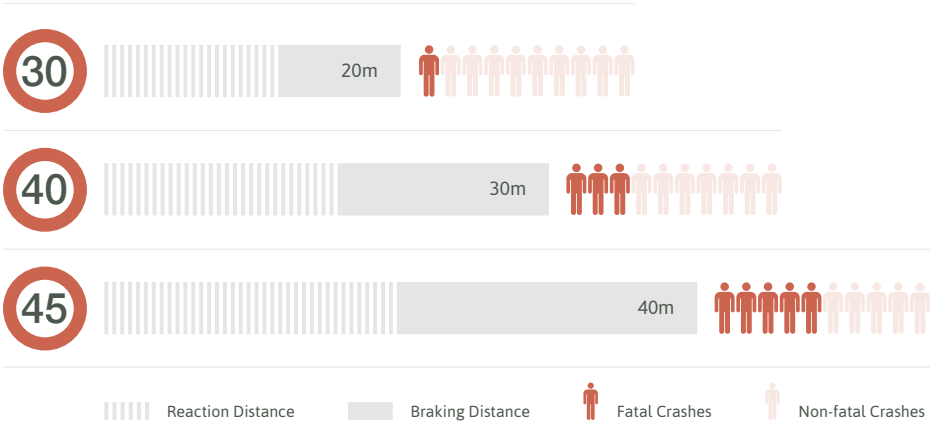
Local Paths should be designed, built and maintained for a vehicle speed of 30kph at most (85th percentile speed).

Higher traffic speeds increase the severity of traffic crashes and increase the stopping distance of vehicles (as shown below). Reducing traffic speed results in safer and more pleasant streets. Slow streets are critical for Local Paths where sharing the roadway between cars and people on bikes is expected.

Posted speed limits are an unreliable method for determining traffic speeds. Actual vehicle speeds should be surveyed to determine the 85th percentile speed. Physical interventions will likely need to be implemented to effectively and reliably reduce speed.

Acceptable: 30kph (85th percentile speed)

Effects of Vehicle Speed on Braking Distance and Fatality Rate in Vehicle-Pedestrian Collisions

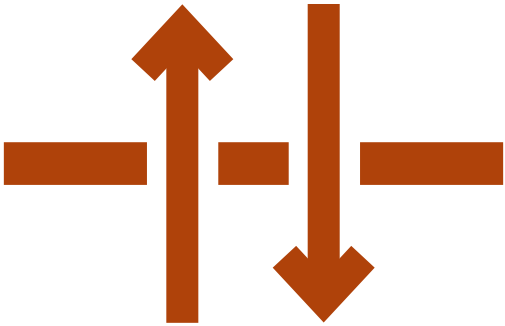


Arterial Road Crossings

At intersections with arterial or collector roads, Local Paths should be designed, built and maintained to provide a minimum of 50 crossing opportunities per hour.

Because most Local Paths will at some point link up to or cross a major street, it is important to include the requirements for these road crossings in this design guide. To ensure people can safely cross arterial roads without too much delay, these crossings should be easy and comfortable. A minimum target of 50 crossing opportunities (either signaled or unsignaled) per hour is required, but the preferred number is 100 crossing opportunities per hour.

Ideal: 100 crossing opportunities per hour
Acceptable: 50 crossing opportunities per hour



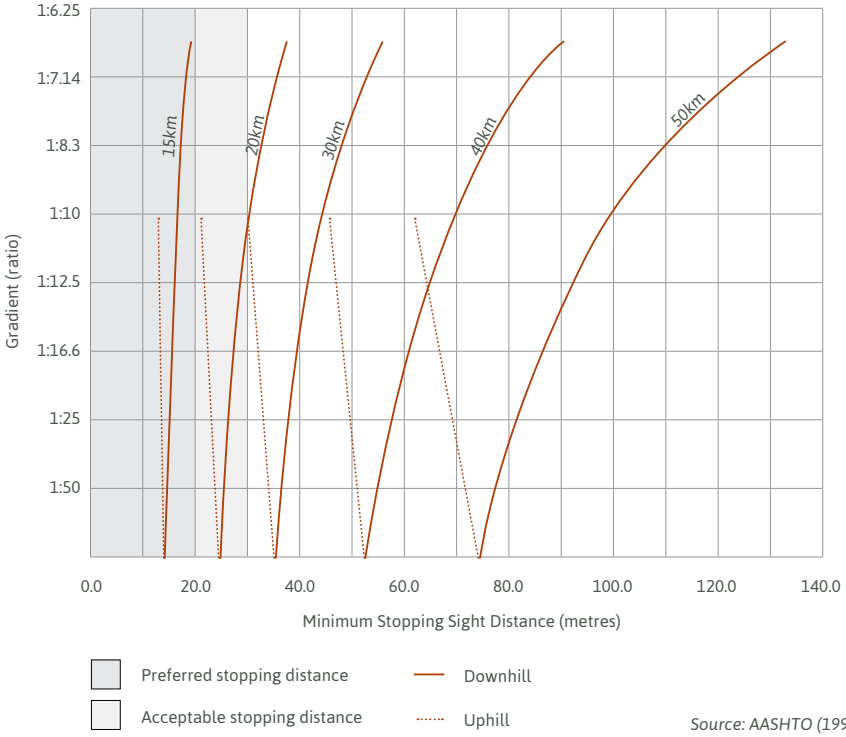
Bicycle Speeds

The maximum design speed for cyclists on Local Paths in parks and open spaces is 20km/h.

The primary challenges for creating safe and accessible on-street Local Paths is to reduce and slow vehicle traffic, when the Path is running through a park or open space and no vehicles are present, the challenge is to slow cyclists.

Acceptable: 20kph

Safe Stopping Distances for Cyclists



Source: AASHTO (1991)

Accessibility & Safety

Local Paths should be accessible and safe for people of all ages and abilities.

Local Paths should be designed for the most vulnerable users. In most cases this will be the young, the elderly and people with physical disabilities. In particular they should be consistent with the principles of universal design and usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. Where possible, Local Paths should also be consistent with The Ministry of Justice's Seven Qualities of Safer Spaces: access, surveillance and sightlines, clear and logical layout, a mix of activity, a sense of ownership, high quality environments and active security measures.

Local Paths should be wide and unimpeded to allow for easy walking and cycling and should have gentle gradients made of appropriately textured materials with smooth transitions between surfaces. Local Paths must maintain clear sight lines around corners and over the crests of hills to ensure that sufficient distances are maintained to enable evasive action if required. In situations where it is not possible to allow for surveillance and a mix of activity such as through a park or open space, consideration should be given to increasing the visual permeability of fences enclosing the park or open space.

The Ministry of Justice 7 Qualities of Safer Places

Access: Safe movement and connections

Surveillance and sightlines: See and be seen

Layout: Clear and logical orientation

Activity mix: Eyes on the street

Sense of ownership: Showing a space is cared for

Quality environments: Well designed, managed and maintained environments

Physical protection: Using active security measures

Green Infrastructure - Streets

Whether through a park or along a street, a Local Path should be 'leafy and green' in character and contribute positively toward the ecological function of the site.

MInimum Green Threshold
The diagram below provides guidance on the minimum and preferred thresholds of green required for a Local Path on a street.

No or minimal green
Grass berm only with minimal street trees +/or some borrowed green from adjacent properties
Impervious surface 90-100%
Tree canopy coverage 0-10%

MINIMUM GREEN THRESHOLD

Grass berm + street trees at maximum of 20 meter centers (some borrowed green +/or irregular shrub planting)
Impervious surface 70-80%
Tree canopy coverage 10-30%

PREFERRED GREEN THRESHOLD

Grass berm
Integrated water sensitive urban design +/or regular street trees
Impervious surface less than 70%
Tree canopy coverage greater than 30%

Green Infrastructure - Parks & Open Spaces

Whether through a park or along a street, a Local Path should be 'leafy and green' in character and contribute positively toward the ecological function of the site.

MInimum Green Threshold
The diagram below provides guidance on the minimum and preferred thresholds of green required for a Local Path through a park or open space.

Grass / turf park, minimal planting

MINIMUM GREEN THRESHOLD

Picturesque Park - Grass with assorted canopy trees with some low level planting.

PREFERRED GREEN THRESHOLD

Forest Park - Multi layered self regenerating forest

PART TWO
NETWORK PLANNING

2.0
INTRODUCTION

The Network Planning section provides an outline of Local Path types, as well as a step-by-step illustration of how to plan a Local Path network through existing and new neighbourhoods.

This is not intended to be an exhaustive or definitive process, but rather a description of how interested individuals and/or professionals can begin to imagine the development of a Local Paths project that supports improved walking and cycling in their neighbourhood while creating more pleasant and friendly neighbourhoods.

As stated, this chapter falls into two parts.

Part one, provides an overview of the broader context for Local Paths, including the principles and performance standards that should guide the design of a Local Path.

Part two, Network Planning, is situated within the framework laid out in Part One, providing a step-by-step methodology for guiding designers and individuals in the planning and design of a Local Path network.

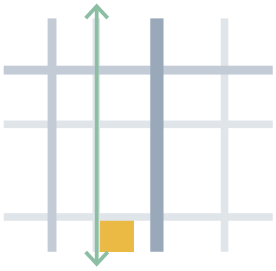
2.1

LOCAL PATH TYPES

Whether on a street or through a park, there are a number of Local Path types that make up a Local Path network. While Local Paths vary in detail there are essentially three main types of Local Paths: an Alternative Route provides an alternative to a busy arterial, a Destination Feeder connects neighbourhoods to local destinations, and a Route Feeder connects neighbourhoods to Express Paths.

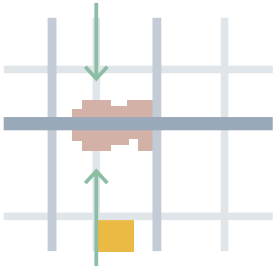
Alternative Route

Provides an alternative to a busy arterial.



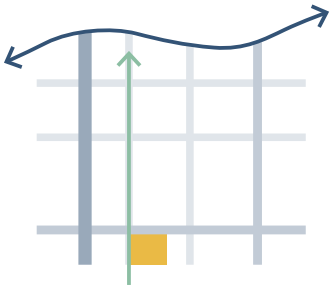
Destination Feeder

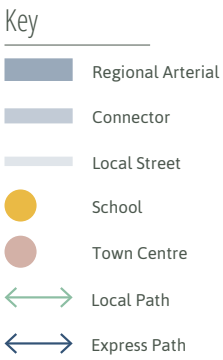
Connects neighbourhoods to local destinations.



Route Feeder

Connects neighbourhoods to Express Paths.





2.2
NETWORK PLANNING

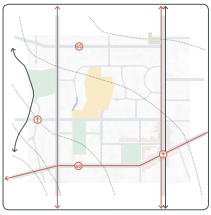
The following outlines a methodology to plan a neighbourhood Local Path.

An effective Local Path requires careful planning to ensure it fulfills the key outcomes of connecting neighbourhoods to key destinations and transport networks. The process for planning a Local Path can be broken down into a sequence of key steps as shown below. Engaging the community for which you are designing a Local Path can be done in a number of ways throughout the process of planning your Local Path. Suggested methods and case studies can be found in the Tools for Placemaking section.

STEP 1

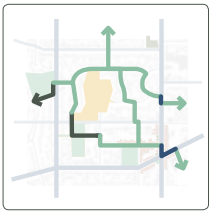
Identify Neighbourhood Destinations & Connections

STEP 2



Collect and Analyse Base Data

STEP 3



Identify Local Path Routes

STEP 4

Identify Key Design Requirements

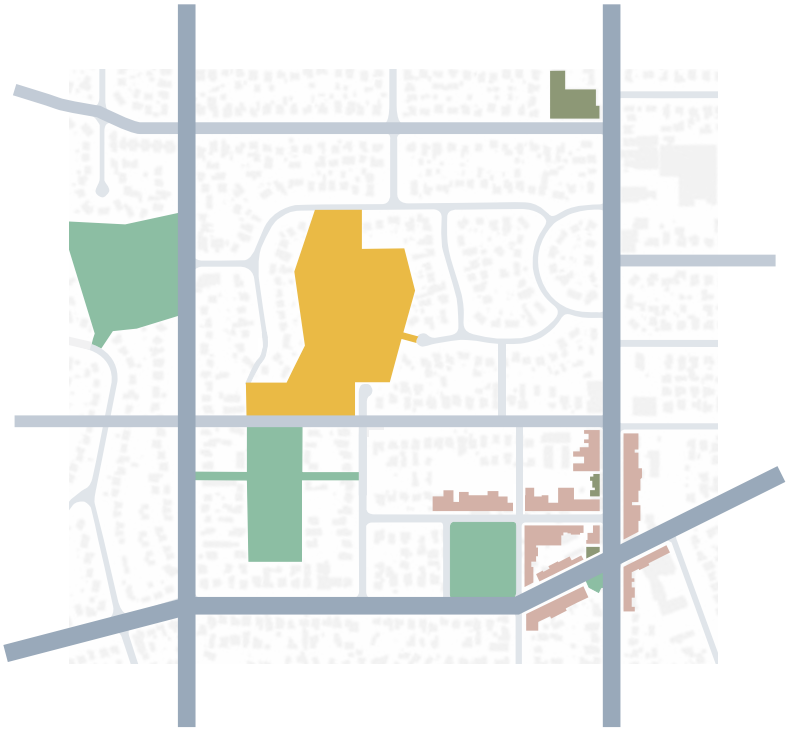
STEP 5

Putting it All Together: Applying the Tools

Step 1_ Identify Neighbourhood Users, Catchments, Destinations and Connections

The development of a Local Path should begin with the identification of intended users, catchments, local origins and destinations, as well as transport connections.

Broad desire lines should be drawn to illustrate the potential to connect neighbourhoods to destinations. Consider the attraction and utility of the destination. How many people are going here? Are they travelling daily or just on weekends? In many cases multiple destinations can be linked up to expand the functionality of the network. Connection to wider transport networks such as core bicycle facilities (Express Paths) and transit stations and stops should also be included.



Land Use + Key Destinations

- Residential
- Town Centre
- Open Space
- School
- Place of Worship

Surrounding Street Grid

- Regional Arterial
- Connector
- Local Street

Step 2_ Collect and Analyse Base Data

A base plan should be prepared including:

- Existing and future land uses.
- Surrounding street grid .
- Property parcels and land ownership.
- Topography.
- Existing infrastructure, including existing paths and below ground infrastructure such as storm water, power and waste water
- Existing and/or preferred pedestrian and cycling routes.

Base Data

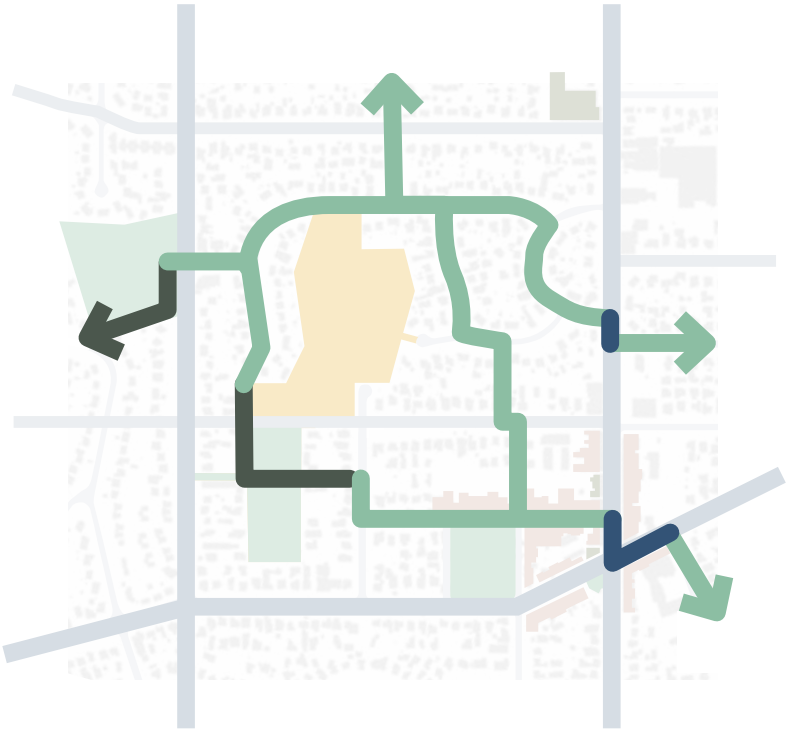
- Property Parcels
- Crash History
- 65 Traffic Speed Data (Radar)
- Express Bike Path
- Frequent Bus Network
- Existing ped/cycle routes
- 5m Contour

Vehicle Volumes + Speeds

	Typical Volume (ADT)	*Typical Speed (km/h)*
Regional Arterial	10,000 - 15,000	50
Connector	2,000 - 5,000	50
Local Street	500 - 2,000	40 - 50

Step 3_ Identify and Evaluate Local Path Routes

Using the broad desire lines between destinations identified in Step 1, with the data sets compiled in Step 2, it becomes possible to identify potential Local Path routes in the existing street network.



Local Path Types

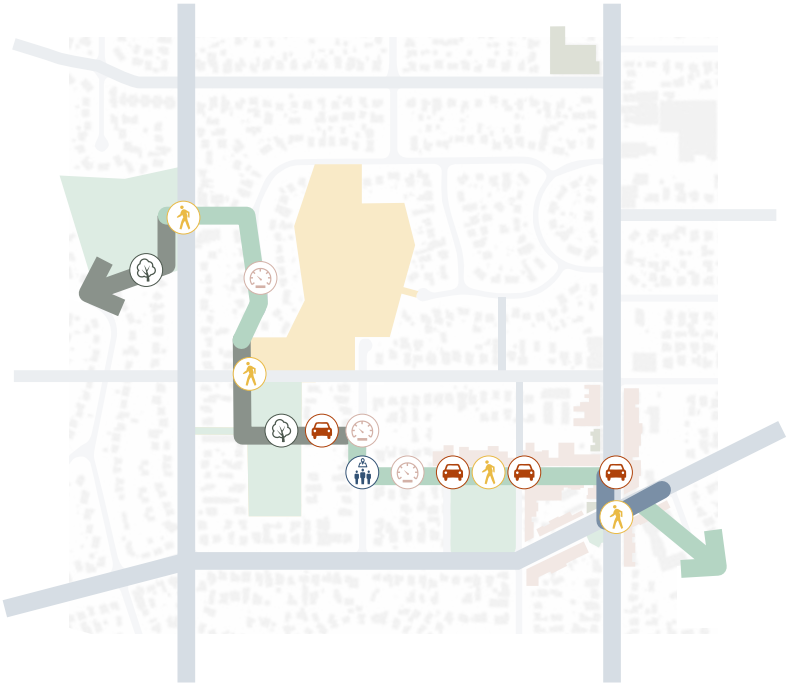
- Express Path
- Local Path_ Street
- Local Path_ Open Space

Step 4_ Identify Key Design Requirements

Along your chosen route, identify key requirements of the Local Path design, where necessary including:

- Placemaking Opportunities.
- Traffic Reduction Measures.
- Speed Reduction Measures.
- Safe Street Crossings.
- Requirements for Signage and Path Markings.

At this stage of design process, it is important to obtain high-level cost estimates for your Local Path.



Key Design Requirements

- Reduce Traffic Volumes
- Reduce Traffic Speeds
- Crossing the Street
- Signage & Road Markings
- Placemaking
- Parks

Step 5_ Putting it All Together: Applying the Tools

With the Local Path route determined and the key design requirements identified, specific features from the Local Path Tool kit are specified to achieve the desired result. Using the tools found from page 30 onwards, identify a range of tools to use in the design of your Local Path. At this stage of the design process, it is important to obtain cost estimates for tools.

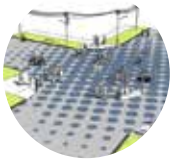
Identified Tools

1 Park Entry/Exit

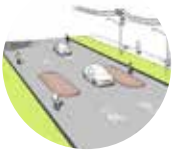
2 Kerb Extension

3 Speed Cushion

4 Round About



5 Tactical Urbanism



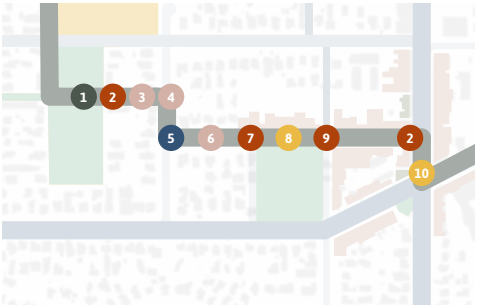
6 Pinch Point

7 Cul De Sac

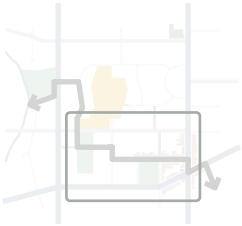
8 Signalised Crossing

9 Diagonal Diverter

10 Cycle Crossing



Key Plan



Putting it All Together: Neighbourhood View*

This example diagram depicts how a range of tools can be combined to form a Local Path.

** Please note that tools expressed in this diagram are indicative only and don't represent preferred numbers, locations or combinations of tools.*

PART THREE
LOCAL PATH TOOL KIT

3.0

INTRODUCTION

The Local Path Tool kit provides the tools needed to create a successful Local Path. These tools are organised into six categories - placemaking, parks, traffic volume reduction, traffic speed reduction, crossing the street, and signage and path markings.

Tools for Placemaking

Tools for Parks

Tools to Reduce Traffic Volume

Tools to Reduce Traffic Speed

Tools for Crossing the Street

Signage and Street/Path Markings

3.1
TOOLS FOR PLACEMAKING

The Tools for Placemaking section provides guidance for engaging mana whenua and working with communities, as well as improving the amenity, character and ecological function of a Local Path. The Te Aranga Design Principles outline an agreed framework for partnering with mana whenua. Tactical urbanism, intersection repair and street based initiatives outline a range of tools for actively engaging the community through the planning, design and implementation phases of a Local Path project. Water sensitive urban design, street trees, pollinator pathways and berm gardening all provide tools for improving the character and amenity of a Local Path, as well as integrating ecological function into a Local Path.

Te Aranga Design Principles

Tactical Urbanism

Street-based Community Initiatives

Water Sensitive Design

Street Trees

Pollinator Pathways

Berm Gardening

Te Aranga Principles

This design framework provides the opportunity for mana whenua to ensure the incorporation of an appropriate narrative that will enhance the intrinsic and cultural fabric, engender a sense of place, recapture those aspects of their cultural history that are embedded in the whenua and upon the korowai of their people, past, present and future. In order to effectively integrate the Te Aranga Design Principles into the design of a Local Path, it is critical to engage mana whenua early on during the design process.

Mana Rangatiratanga - Authority

The status of iwi and hapu as mana whenua is recognised and respected

Whakapapa - Names and Naming

Maori names are celebrated

Taiao - The Natural Environment

The natural environment is protected, restored and / or enhanced

Mauri Tu - Environmental Health

Environmental health is protected, maintained and / or enhanced

Mahi Toi - Creative Expression

Iwi/hapu narratives are captured and expressed creatively and appropriately

Tohu - The Wider Cultural Landscape

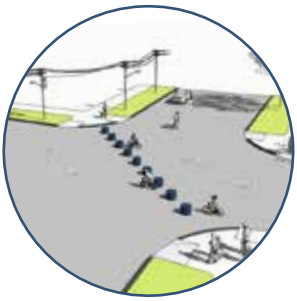
Mana whenua significant sites and cultural landmarks are acknowledged

Ahi Kā - The Living Presence

Iwi/hapu have a living and enduring presence and are secure and valued within their rohe

Tactical Urbanism

Tactical urbanism, often described as the 'lighter, 'quicker, cheaper' approach to placemaking, is a design methodology that involves a number of temporary 'design experiments'. These 'experiments' test the design, programme and arrangement of a public space (such as a street) in a low-cost, low-risk and low-commitment way. The aim is that these experiments are measured for effectiveness and those that work are either left in place, or implemented in a more permanent manner. Below is an example:



Phase 1

On an identified Local Path route, concrete bollards or planter boxes can be implemented quickly, cheaply and on a temporary basis to test the effectiveness of a project.

Phase 2

If Phase 1 proves successful, a wider and more permanent iteration can be tested, with a painted surface and larger planter containers for better amenity. The testing may finish at this stage.

Phase 3

Following Phase 2, a permanent outcome utilising water sensistive design tools could be installed, providing shade, habitat for wildlife and improved amenity.

Street Based Community Initiatives

There are a growing number of initiatives that can be championed and implemented directly by citizens and communities that re imagine our streets as more than simply spaces for motorised vehicles, but as valuable places that cater to people of all ages and abilities and for a wide range of activities. Below are four examples of street-based initiatives that can be directly employed by communities and citizens.

Street/Block Parties

Street or block parties temporarily reclaim a neighborhood street entirely from vehicle traffic through blocking off a small portion of a residential street. Block parties are often used as a way to celebrate and strengthen the community by creating connections between neighbours.

Play Streets

Typically a play street involves closing a street for a couple of hours a week / month for children to freely play in their neighbourhood streets. Play Streets provide a fun gathering place for community, as well as mitigate against childhood obesity. Play streets have seen a resurgence in UK.

Transition Streets

Transition Streets involves groups of neighbours meeting every few weeks to develop and implement a plan to make easy changes to improve how they use energy, water, food, packaging, transportation, and more. The goal is to engage those that may not see themselves as green to make changes to live more sustainably.

Water Sensitive Design

Water Sensitive Design (WSD) is an interdisciplinary design approach, which considers stormwater management in parallel with the ecology of a site, best practice urban design, and community values. WSD aspires to ensure multiple public benefits from stormwater management and to develop a unique 'sense of place' for our communities. A WSD approach considers multiple objectives influencing project outcomes, including urban design, landscape amenity, and community issues and aspirations. Stormwater management is targeted to where the greatest benefit can be achieved for both community and ecological outcomes.

Design Considerations and Recommended Usage

- 1/12 or approximately 8% of the total area of any given area of impervious surface should be dedicated to bioretention devices such as rain gardens.
- Any planting needs to maintain clear sightlines between different users of the street.

Street Trees

Street trees provide a significant structural element to the streetscape by framing the street, defining space for pedestrians and by helping to separate the footpath from the carriageway. They are symbolic of the landscape's cultural heritage and contribute positively to the ecology of the local environments.

Design Considerations and Recommended Usage

- Street trees should be appropriate to the local ecological context and neighbourhood character
- Explore how the street trees can form part of an integrated approach to water sensitive urban design strategy for the street and Local Path network.
- Offset street trees from driveway entries.
- Ensure street trees do not interfere with street lighting, overhead power lines and utilities.

Pollinator Pathways

With one third of our food dependent on pollination by insects and other animals, we are deeply dependant on pollinators for our survival. The expansion and intensification of Auckland's urban environment often results in a reduction of soft landscape spaces in the city. With every bit of soft landscaping we replace with hard urban space, we lose crucial habitat for pollinators. The concept of a pollinator pathway seeks to address this issue by establishing a network of habitat by which pollinators can traverse urban environments. Local Paths present a key opportunity to the concept of a pollinator pathway as the vegetated backbone which links other vegetation to complete a pollinator pathway.

Design Considerations and Recommended Usage

- Once an area is above a density threshold, pollinator pathways become less feasible as corridors are required for other functions.
- If there is a risk that maintenance is going to be sporadic then low maintenance native plants are recommended.
- Where possible, employ pollinator pathways to connect existing areas of habitat.

Berm Gardening

Berm gardening refers to community initiated management of berms and other landscaped areas within the road reserve (property boundary to property boundary). Internationally, berm gardening is positively recognised for enabling communities to establish local character, building social capital, neighbourhood cohesion and lively streets, increasing property values and providing habitat.

Design Considerations and Recommended Usage

- Once an area is above a density threshold, berm gardening becomes less feasible as footpaths are required for other functions.
- Maintenance requirements of plants needs to be considered carefully. If there is a risk that maintenance is going to be sporadic then low maintenance native plants are recommended.
- Ensure that the character of the planting considers the specific types and character of planting in the neighbourhood.

3.2
TOOLS FOR PARKS

Safe and easy access through Auckland's parks and open spaces is an integral part of Auckland's Local Path network. A Local Path through a park is a path for people on bikes and pedestrians, that can be either separated or shared. Together with the Local Paths on streets, they are designed to create linkages to local centres, parks, and schools as well as between Express Paths.

For more information on the design of parks and open spaces see the **Auckland Design Manual Parks Hub.**

Entries / Exits

Pathway Dimensions

Gradients - Long Fall

Gradients - Cross Fall

Level Changes

Intersections

Internal Park Road Crossing

Impermeable Surfaces

Permeable Surfaces

Bridges and Boardwalks

Edge Treatments

Balustrades, Barriers and Fences

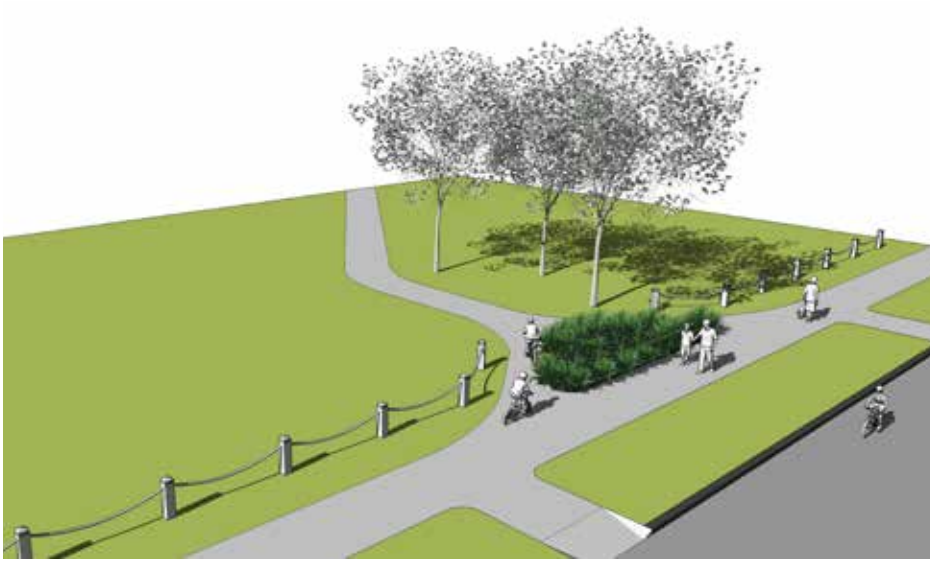
Lighting and Furniture

Entries & Exits

The entry/exit points of a park or open space creates the transition between a Local Path running through a park or open space and a street based Local Path, Express Path or Trail. The entry/exit should provide a smooth transition between the different types of walking and cycling infrastructure and should be safe and accessible to all users. Entry/exit points of a park or open space should be well defined and kept as clear of vehicles as possible. In some circumstances it may be appropriate to emphasise and celebrate the entry/exit point of a park or open space with a public artwork or a one-off sign unique to the place. Bespoke peices could incorperate input from/be produced by a local artist, school or other community members.

Design Parameters

- Maximum dimension of unobstructed pathway at entry/exit point to 1.4m to exclude vehilce entry.
- The design and layout of entry/exit points should conform to minimum site lines relative to design speed and should ensure that sight lines are long enough to allow for evasive action if required.



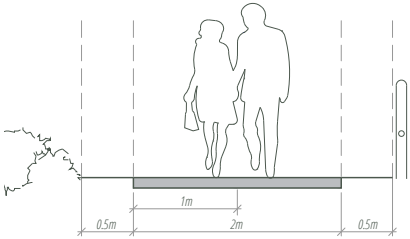
Pathway Dimensions

The width of the path determines the capacity of the Local Path and it is one of the first question to be asked in the design of a Local Path. Together with the gradient and the material of the path, the width also determines the use and function of the Local Path. While paths can be either shared or separated, shared paths are most common and offer the best balance between usability and cost.

Prefered Widths

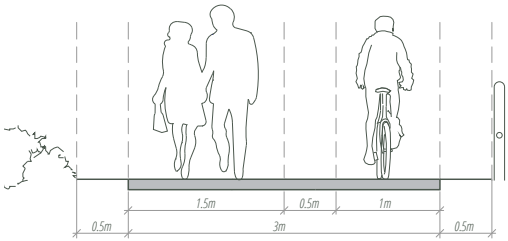
Pedestrian - 2m

Desirable Width - 2m
Minimum Width - 1.8m
Minimum Offset - 0.5m



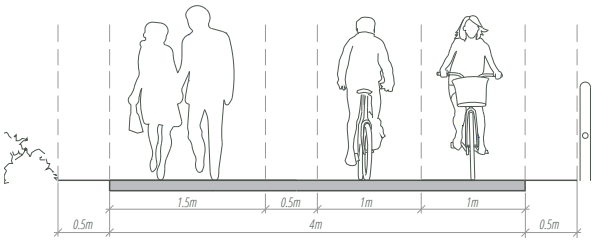
Shared Path - 3m

Desirable Width - 3m
Minimum With - 2.5m
Minimum Offset - 0.5m



Multi Use - 4m+

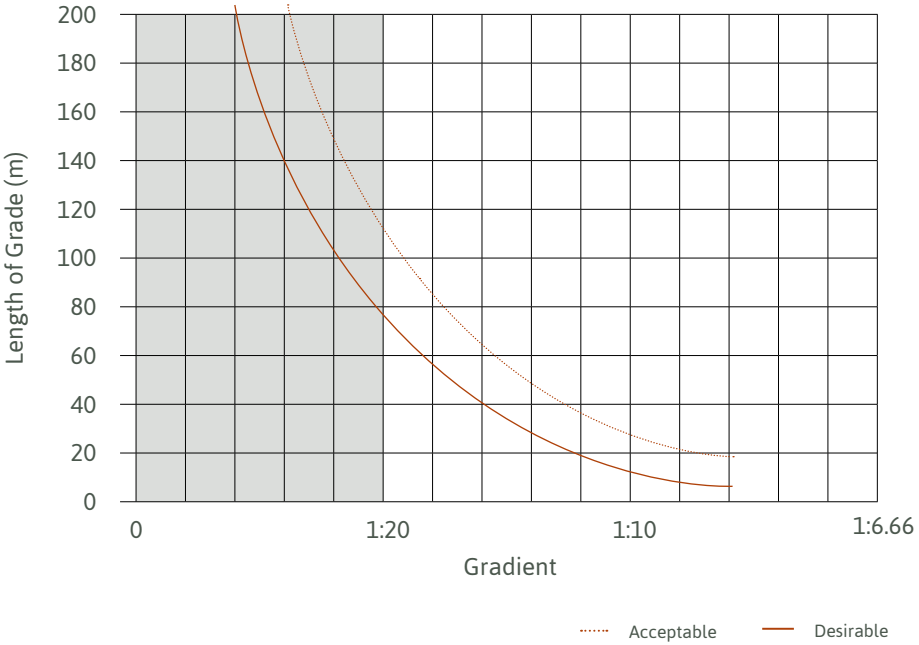
Desirable Width - 4m+
Minimum Width - 4m
Minimum Offset - 0.5m



Gradients - Long Fall

The long fall gradient is one of the most important factors determining the accessibility, safety, comfort and experience of the Local Path. Ideally, the design of a Local Path should allow the user to experience the landform of the Park or Open Space with a balance of crests and troughs while the risks of riding down a steep grade and the difficulty of riding up should be minimised.

Gradients for Down Hill Safety



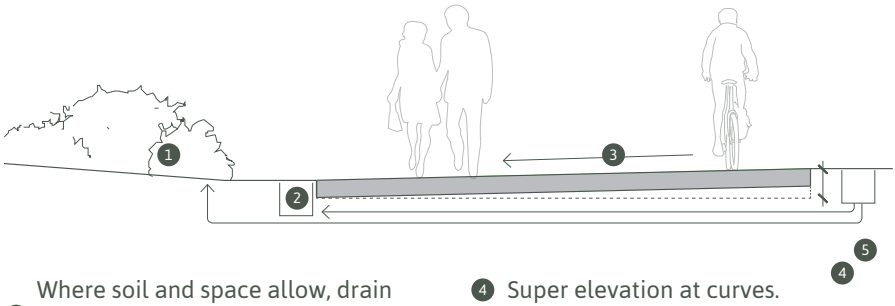
Gradients - Cross Fall

Cross fall refers to the gradient across the Local Path as well as the curvature and ramping of a path around corners. The gradient, surface material and site conditions, in particular soils, vegetation cover and avaliable area, together determines the drainage requirements of the Local Path.

Drainage infrastructure increases the upfront and ongoing maintenance costs for a Local Path. Drainage infrastructure should be minimised and located only where required. Where possible, runoff from paths should be directed towards permeable soils,vegetated areas, WSD devices or other localised means to disperse the water.

Care needs to be taken when using unbound material on paths if there is a risk of material migration which will decrease the safety of the path and require increased maintenance.

Cross Fall and Drainage



1. Where soil and space allow, drain to permeable soils, vegetated areas, grass areas or other WSD devices.
2. Where 1 is not possible, drain to existing stormwater system.
3. Cross Fall.
4. Super elevation at curves.
5. Pervious paving, filter drain or cross culvert to prevent seepage across path surface. Water should be diverted to permeable soils, vegetated areas, WSD interventions or the stormwater network.

Level Changes

A level change is a section of the Local Path that exceeds a maximum of 1:20. A level change can be expressed through either a series of ramps and/or steps. Where stairs are unavoidable provision should be made to allow people on bikes to walk their bike either up or down the stairs and where practical, an alternative route should be provided for those with physical disabilities.

Design Parameters - Stairs

- For regulations on accessible gradients and level changes, please refer to the New Zealand Building Code, Clause D1 - Access Routes.
- Bicycle wheeling ramps should be installed on all new paths with stairs and where practical, retrofitted onto existing stairs - Specifications for these are:
    - Gradient should not exceed 1:4 (25%)
    - Ramp should be min 0.4m from any wall or obstacle to avoid pedal and handle clashes
    - Consider a wheel ramp on both sides of the stairs where volumes are high
    - Transition at top and bottom of ramp should be as smooth as possible

Design Parameters - Ramps

- **Accessible Pedestrian Routes**
    - 1:12 acceptable slope - With handrails
    - 1:20 acceptable slope - Without handrails
    - For every 750mm rise - a 1200mm level landing is to be provided

- **Shared Routes**
    - 1:10 slope is acceptable up to 50m in length where pathway is straight
    - 1:6 slope is acceptable for lengths up to 50m where the horizontal path is curved and/or changes alignment
    - For every 1500mm rise - a level landing equal or greater than the width of the ramp is to be provided
    - For cycling purposes - paths that exceed these parameters are considered extremely hazardous
    - The minimum inside radius for hairpin turns on ramps is 2.5m

Intersections

An intersection is a junction between Local Paths and/or between a Local Path and one or more paths of another function. The design and layout of intersections is particularly important for the safety of a Local Path. In most intersections in a park or open space, the Local Path will be the widest, and highest priority of the paths. It is important that all users at an intersection are travelling at a speed conducive to eye contact, that clear sight lines are maintained and sufficient space is maintained to allow for safe stopping.

Design Parameters

- Intersection design and layout should conform to minimum sight lines relative to design speed. Typcial minimum sight line distance is 20m. See Safe Stopping Distances for Cyclists page 17 for more detail.
- Where possible, the inside radius of a Local Path at an intersection should be a minimum of 5m.

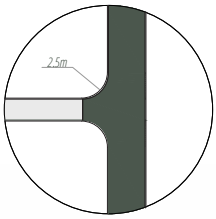
Common Intersections

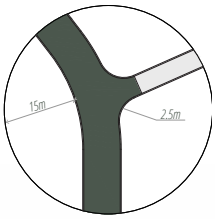
'T' Intersection

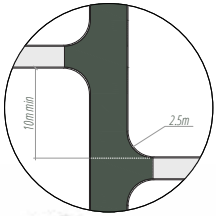
'Y' Intersection

'X' Intersection

Standard





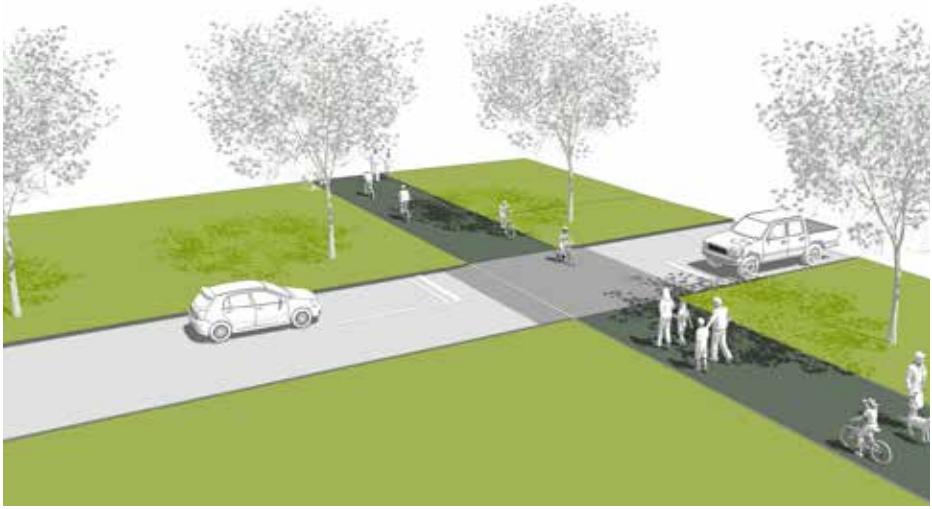


Internal Park Road Crossing

An internal park road crossing occurs when a Local Path crosses a road within a park. The purpose of an internal park road crossing is to reduce the vehicle approach speed and provide a safe and visibly prominent crossing location for people on bikes and pedestrians. An internal park road crossing can be a flush painted or textured strip or a raised crossing.

An internal park road crossing are crossing points where pedestrians and people on bikes do not have legal right of way, but they do highlight a good place for pedestrians to cross. This means that the treatment will (in theory) make it slightly easier for pedestrians to cross, however, there is no formal requirement for vehicles to give way to pedestrians.

In situations where vehicle access needs to be restricted, features from the entries and exits (page 45) should be incorporated into the design and arrangement of an internal park road crossing.



Impermeable Surfaces

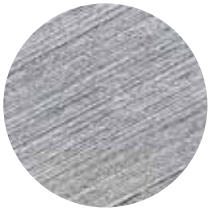
The surface treatment of the path helps to determine the accessibility, safety, comfort and experience of the Local Path. It is also the key factor determining the durability, life expectancy and maintenance requirements of the Local Path. For these reasons, the prefered material for a Local Path through a park or open space is a lightly exposed aggregate of 10mm basalt with a small amount of black oxide to reduce glare. This prefered path is recognisable across Auckland and ties in well with many of Auckland's existing footpaths and paved surfaces. It is long lasting and suitable for high traffic volumes. It has very good slip resistance, is not glary at implementation and utilises regionally sourced aggregates. In many cases there will be good reason to veer away from this standard in order to incorporate additional or alternative materials such as locally sourced and/or recycled aggregates.

Design Parameters

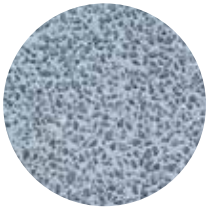
- Intersection design and layout should conform to minimum sight lines relative to design speed. Typcial minimum sight line distance is 20m. See Safe Stopping Distances for Cyclists page 17 for more detail.
- Where possible, the inside radius of a Local Path at an intersection should be a minimum of 5m.

Recommended Impermeable Surfaces

Exposed Aggregate



Brushed Finish



Place Based - Pebble

Place Based - Shell

Permeable Surfaces

There is a wide variety of bound permeable paths suitable for a Local Path through a park or open space. Variations include bound gravel; permeable concrete; permeable unit paving; crushed concrete or brick; resin bound aggregates; hoggin, which is a mixture of clay, gravel and sand; Aggrock, a proprietary stabilised aggregate with a similar look and feel to hoggin; or rubber matting infilled with pebbles. Permeable paths, while not as durable as impermeable paths, have a range of benefits including reduced initial cost, site specific applications around tree roots and the opportunity to provide a unique look, feel and user experience.

Design Parameters

- The slip resistance of all Local Paths paths should have a minimum friction coefficient of 0.4.
- Surfaces constructed to match existing features must have a maximum tolerance of 5mm.

Recommended Permeable Surfaces

Bound Gravel / Crushed Concrete

Hoggin

Permeable Pavements

Reinforced Grass / Pebble

Bridges and Boardwalks

Bridges and boardwalks are typically associated with natural features such as, coastal environments, streams and wetlands and are often employed to bridge over the roots of trees, or boggy areas. The major considerations for the design of a bridge or boardwalk are the structure, the walking / cycling surface and the edge treatment or balustrade (the later two are addressed in the following sections). The structure is typically either timber or steel. The walking / cycling surface is typically timber but can be concrete or steel. In most cases, a timber structure and surface is the most appropriate, value for money approach.

Careful consideration needs to be given to the accessiblity and safety of the boardwalk surface, partcularly with regards to the level of slip resistance.

Design Parameters

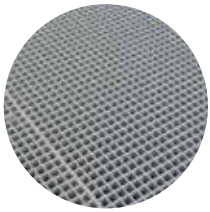
- The slip resistance of all Local Paths paths should have a friction coefficient of 0.25.
- Surfaces constructed to match existing features must have a maximum tolerance of 5mm.

Recommended Surfaces

Timber Deck

Timber Deck with Metal Inserts

Metal Grill



GRP Flooring

Edge Treatments

Edge treatments refers to the outside edges of a Local Path. In most instances, edging is only required when a path is constructed from a bound permeable surface. In some situations, it may be desirable to include an edging to a path of impervious surfaces however this would typically be included as an amenity or place based feature. Edging can be constructed from timber, concrete or steel. Steel edging may be of galvanized steel, stainless or aluminium.

Design Considerations

- The edging of a Local Path should contain the material of the path as effectively as possible.
- The edging of a Local Path should allow for mowing and other landscape maintenance activities.
- In most instances, the edging of a Local Path should be flush with the path and adjacent surfaces.
- Where appropriate, consideration could be given to increasing the width and prominence of the edge of the path to increase the unique qualities of the site, park or open space.

Recommended Path Edge Treatments

Timber

Concrete

Steel

Baustrades, Barriers and Fences

A balustrade or a barrier refers to any vertical element designed to keep people within the Local Path and are primarily employed for the safety of the users. A balustrade is typically 1.4m tall and is designed to restrict the fall from height risk. A barrier is lower than a balustrade and is typically employed when the risk to injury resulting from a fall is minor. A barrier can be either constructed or planted. A fence is typically employed to either keep people out of the Local Path or to prevent other activities from spilling into the Local Path, such as a ball from an adjacent sports field. Balustrades and barriers are designed so that people on bikes may brush against the barrier without getting clothing or bike parts caught or snagged in the structure, a fence is typically not designed with this function in mind.

Design Considerations

- Ensure that the balustrade, barrier or fence is being employed for the appropriate function - see Required Use.
- The choice of material and planting should be appropriate to the context - for example a fence should be visually permable and planting low lying where passive surveillance is required.
- In constrained sites, path widths may need to be reduced to allow for the balustrade, barrier or fence.
- In most instance, a planted barrier is prefered to a balustrade, fence or constructed barrier.
- Where the use of a balustrade, fence or constructed barrier is required, a planted barrier may be included to soften the visual appearance of the the balustrade, fence or constructed barrier.
- Maintenance requirements of plants needs to be considered carefully. If there is a risk that maintenance is going to be sporadic then low maintenance native plants are recommended.
- Ensure that the character of the planting considers the specific types and character of planting in the park or open space.

Lighting and Furniture

Lighting is important to the safety and placemaking qualities of a Local Path. Lighting is described using a 'P' rating which measures the horizontal and vertical illumination of an environment. Horizontal illumination allows users to identify and avoid potholes and obstacles, follow the path, and read surface markings. Vertical illumination allows users to identify features such as fences, walls, kerbs, trees and shrubs. The culmination of horizontal and vertical illumination reduces the effect of shadowing at night. In most instances, a park or open space is required to be lit to a level of either P02 or P03. Special consideration needs to be given to whether or not a Local Path should be lit at night. Lighting at night should be provided when the Local Path is used regularly by commuters after hours, if no other lit path exists and/or if the use of the path is adversely affected by not having lighting. Lighting should not be implemented on Local Paths that are infrequently used or are significantly isolated from adjacent uses meaning there are few or no 'eyes on the Local Path'.

Design Considerations

- The level of lighting provided must be appropriate to the required function - see design parameters.
- Lighting and lighting columns can be used as a wayfinding element during the night and day.
- Local Paths should be future proofed for lighting, even if lighting is not intended in the first instance by either installing ducting at the time of implementation or by allocating space on either side of the path.
- Where appropriate, consideration should be given to the incorporation of lighting with placemaking at entry and exit points and at intersections.
- In places with dense tree coverage, a combination of lighting columns with dual fixtures might be considered.

3.3
TOOLS TO REDUCE TRAFFIC VOLUME

Local Paths should be designed, built and maintained for a maximum average of 2,000 vehicles a day.

Minimising traffic volumes of streets and the corresponding exposure of pedestrians and people on bikes to motorised vehicles is critical to a safe and attractive Local Path. Tools to reduce traffic volume take the form of constructed barriers that limit automobile traffic access onto a Local Path route from the major cross-street, and are typically located at major cross streets. They should permit access by people walking and biking, and where required, they must accommodate the access needs of emergency response vehicles.

Diagonal Diverter

Median Barrier

Kerb Extension Semi-diverter

Vehicle Road Closure

Diagonal Diverter

A diagonal diverter breaks a standard four-way intersection into two opposing left- or right-turn corners. The diagonal diverter can be accomplished with full kerb and sidewalk connections, though small islands are also possible. Bicycle access is enabled via a split in the center of the intersection and via widened ramps at the former corners. Pedestrian pathways remain the same.

Design Considerations and Recommended Usage

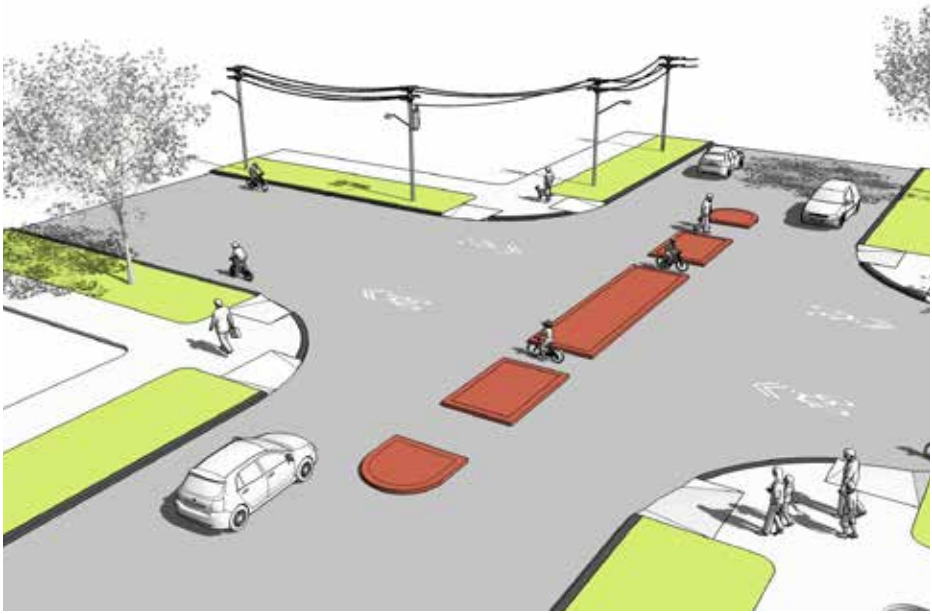
- Street network access, including analysis of the impacts of diverted traffic.
- May require an alternate emergency response route.
- May impact street maintenance
- Provides good opportunity for landscaping. Native and low maintenance plants are recommended.
- Consider the pedestrian desire for a diagonal crossing and cater for it.

Median Barrier

This island blocks vehicle entry to a street by eliminating right turns from the through street – usually a major cross street - by implementing a raised traffic island. The island also eliminates right turns from the side street, making the side street operate as "left in, left out" only. Gaps are retained for pedestrian and bike access. This allows the bicyclist or pedestrian to cross while focusing on one direction of traffic at a time (two-stage crossing).

Design Considerations and Recommended Usage

- Where a Local Path crosses a collector or minor arterial street.
- On wide roadways with multiple lanes of traffic or few gaps in traffic to allow two stage crossings.
- Effective when located between signalised intersections, as the signals create gaps between waves of motor vehicles.
- Street network access, including analysis of diverted traffic.
- Emergency vehicle access analysis
- Opportunities for landscaping

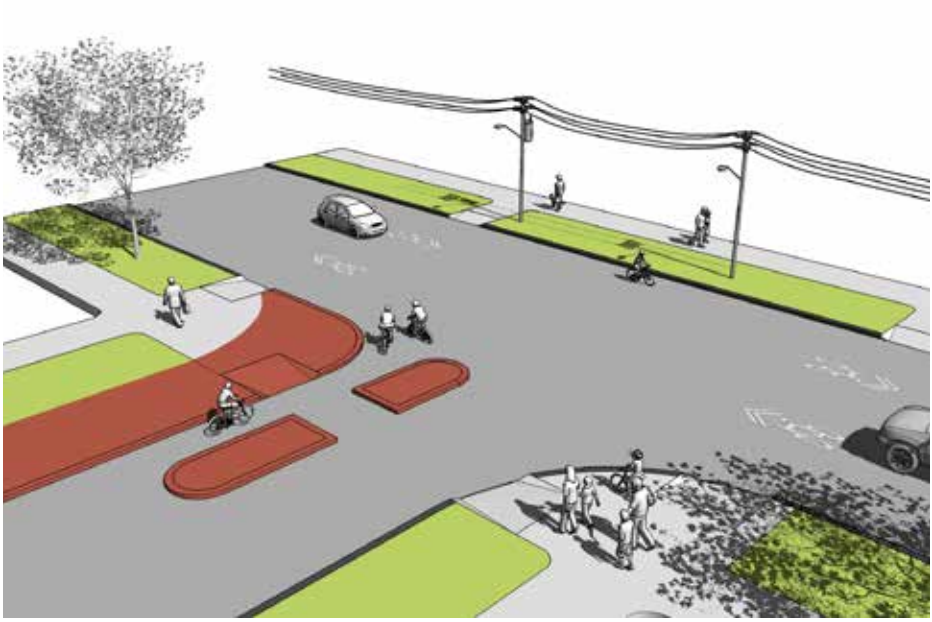


Kerb Extension with Island Semi-diverter

Kerb extension semi-diverters block vehicle entry to a street by closing off either the inbound or the outbound lane into a street. A traffic island is placed near the centerline with a gap between the island and kerb extension to permit bicycle entry.

Design Considerations and Recommended Usage

- A well connected street network is required, so access is retained.
- Not suitable for streets that have bi-directional bus routes.
- Can be combined with a pedestrian crossing to provide additional traffic calming
- Consider pedestrian desire lines

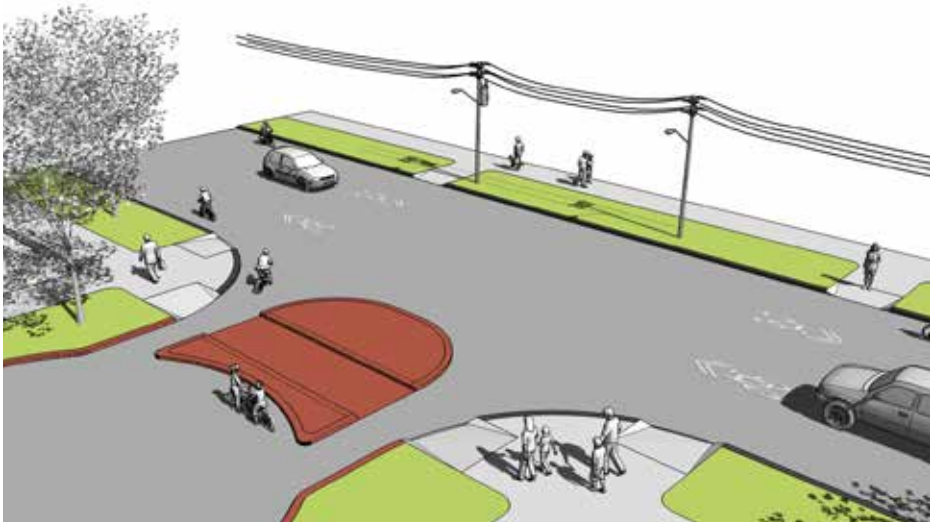


Vehicle Road Closure (Cul-de-sac)

Where space is available and the street network is sufficient, providing a turning circle, or cul-de-sac is the most effective solution at reducing motor vehicle traffic volumes along the street. Additionally, a cul-de-sac can be planted to improve the amenity of the street. Special consideration should be given to service vehicles to allow them to turn around in the turning circle provided.

Design Considerations and Recommended Usage

- Street network access, including analysis of the impacts of diverted traffic.
- Emergency vehicle access requirements
- Provides good opportunity for landscaping. Native and low maintenance plants are recommended.
- Existing stormwater catchment pits can generally be retained
- Typically placed on minor streets at an intersection with a major street, to manage motor vehicle volumes on the minor street.



3.4
TOOLS TO REDUCE TRAFFIC SPEED

Local Paths should be designed, built and maintained for a vehicle speed of 30kph at most (85th percentile speed).

Slow streets are critical for Local Paths where sharing the roadway between motorised vehicles and people on bikes is expected. As such, setting an upper limit to traffic speeds on streets is an important aspect of a safe and attractive Local Path. Tools for reducing traffic speeds take the form of constructed interventions that restrict the flow of traffic and are typically located mid-block and at intersections of streets.

Pinch Point

Raised Table

Speed Hump

Speed Cushion

Mini-roundabout

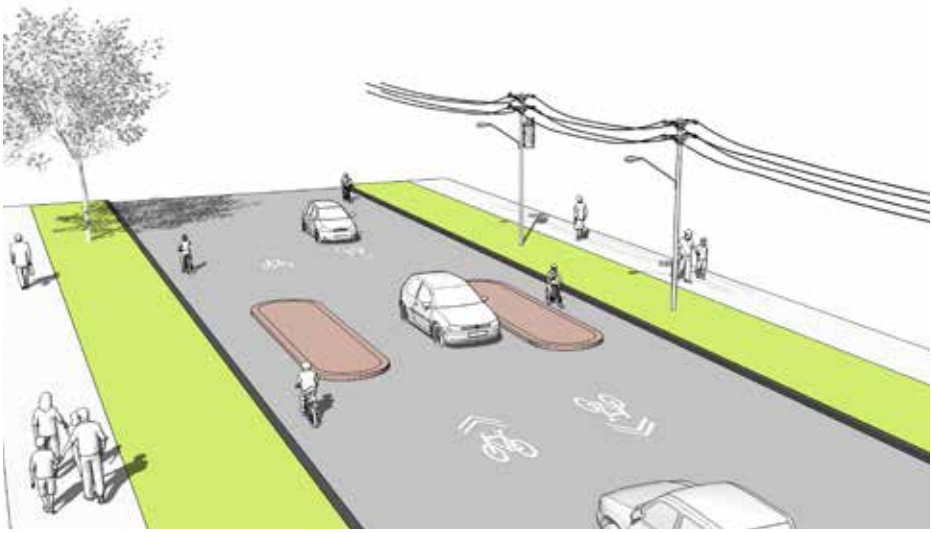
Raised Platform

Pinch Point

Pinch points introduce friction for automobile traffic. Instead of blocking one direction access, traffic in both directions is allowed, but restricted to a single lane, requiring opposing motorists to take turns passing through. Pinch points have been found to reduce speed by 14% and traffic volumes by 20%. The road reserve is narrowed to allow only one vehicle at a time and a by-pass is provided for bicycles on the outside edge.

Design Considerations and Recommended Usage

- This treatment is most appropriate for application away from main road crossings
- Preferred by emergency response agencies to most other traffic calming measures
- This type of traffic calming device relies on eye contact between drivers. Take care when implementing to ensure sufficient intervisibility is available.
- Good opportunity for landscaping. Trees with high canopies are recommended to preserve sight distance.

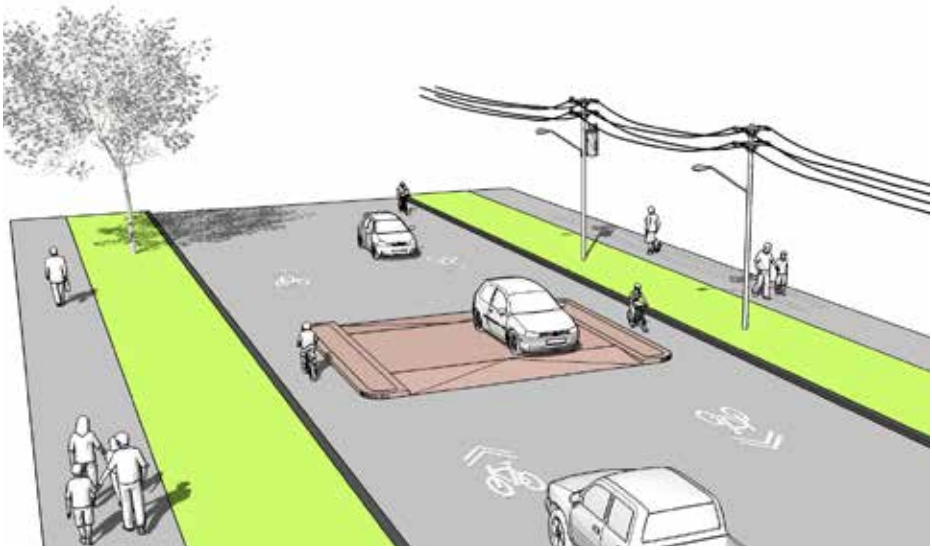


Raised Table

Raised Tables are elongated speed bumps that use a ramp on either side of a flat platform to reduce vehicle speed. They are more comfortable than a speed bump and also more suitable for buses. However, the flat section reduces the slowing effect on motorists at the bump. Motorist design speed varies depending on design, particularly the grade of the ramp. Raised tables have been observed to reduce the 85th percentile vehicle speed by 18%

Design Considerations and Recommended Usage

- Often combined with pedestrian crossings and other traffic calming design elements. Can also be combined with a pinch point.
- Where a bus route has more than 10 speed cushions or 5 speed tables, other methods of traffic calming should be used where possible to avoid additional effects to bus service reliability.
- Slows down all vehicles, including buses and emergency vehicles.

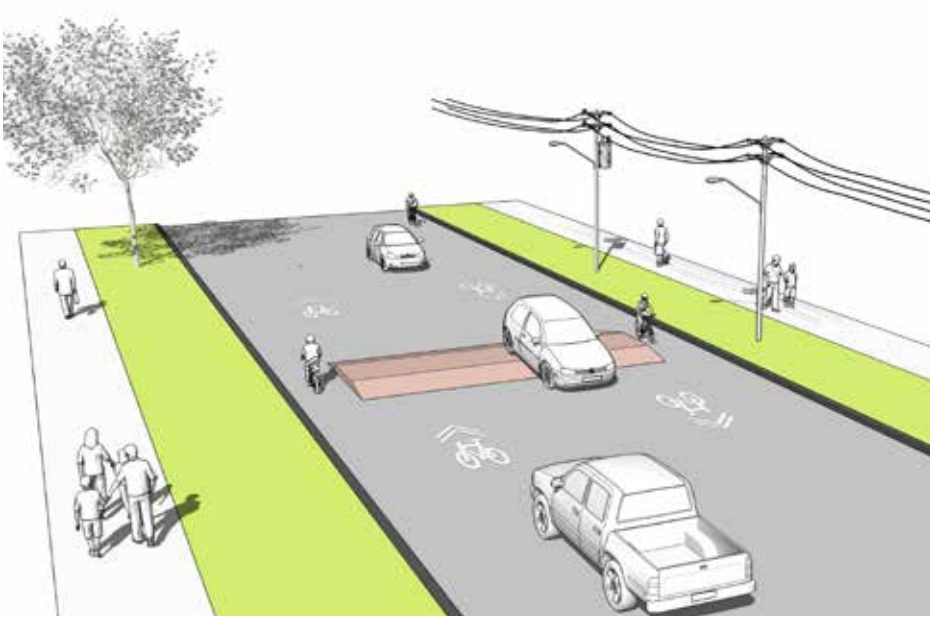


Speed Hump

Speed humps are placed across the road to slow traffic and are often installed in a series of several humps in order to prevent cars from speeding before and after the hump. Speed humps are used on local streets to achieve appropriate speeds for residential streets. The Local Path speed hump should be designed to be narrower in width than the street to provide cycle bypasses.

Design Considerations and Recommended Usage

- Effective tool to reduce speeding.
- Worst-case fire engine delay per speed hump is approximately 9.4 seconds.
- Speed humps do not have a suitable profile for use on bus routes and must not be used in this context
- Speed humps should not be placed in driveways
- To achieve greater speed reduction, place humps closer together

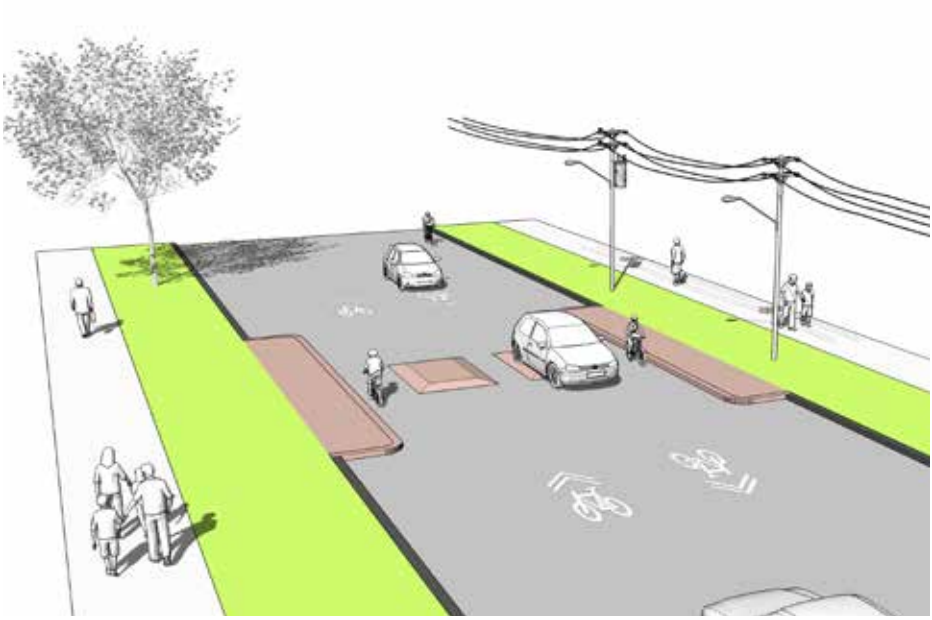


Speed Cushion

Speed cushions are a variation to the speed hump that should only be used on key bus or emergency routes. Channels are added to permit trucks, buses and emergency vehicles to straddle the speed bump which minimises travel delay and discomfort. They are approximately the width of a car and usually placed in rows of 2 or 3 across the road width. Cushions are particularly good at offering traffic calming benefits without significant adverse effects on bus or emergency service access.

Design Considerations and Recommended Usage

- Estimated delay per device for a fire truck is under 2 seconds.
- Locate speed cushions where there is sufficient visibility and available lighting
- Landscaping opportunities (if combined with kerb build-out or pinch point).



Mini-roundabout

Mini-roundabouts are a tool to reduce speeds and improve safety at busier residential intersections. Mini-roundabouts use all the design and operational features of a modern roundabout, but do not necessarily have a landscaped centre island. Instead the edge of the centre island can be fully mountable. This permits mini-roundabouts to be used in constrained environments where truck and bus access is to be maintained.

Design Considerations and Recommended Usage

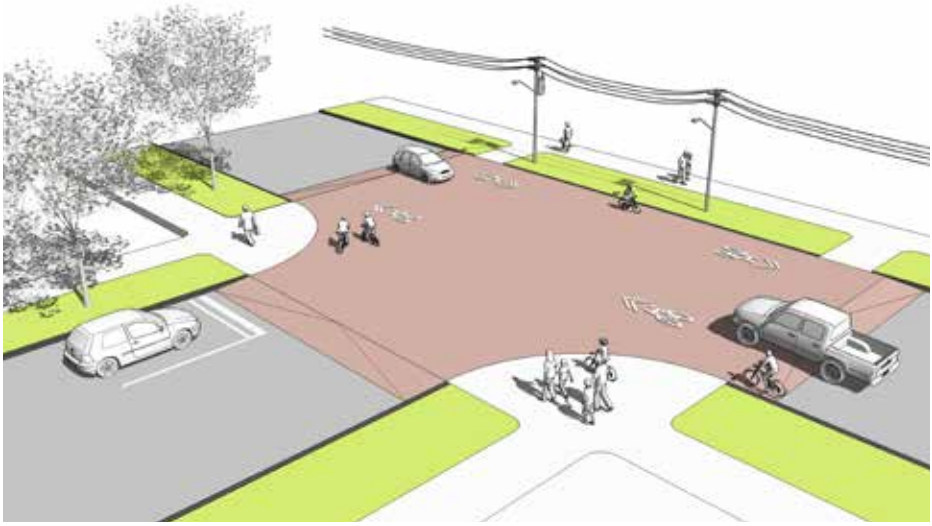
- Consider including kerb-build outs on each approach to facilitate pedestrians crossing and reduce vehicle speeds.
- If kerbed, consider the use of native and other low-maintenance plants in centre island. Public art may also be considered.
- Multiple roundabouts at several intersections along the route are more effective at reducing motor vehicle speed than a single roundabout.

Raised Platform

A raised platform is similar to a raised table but located at the intersection of two or more streets, raising the surface level of the entire intersection. The table extends into each of the streets running up to the intersection. This provides a flat raised surface at kerb height. A raised platform highlights the location of the intersection and lowers the speed at the conflict point, improving intersection safety.

Design Considerations and Recommended Usage

- Raised platforms are recommended for intersections between two minor streets or between a minor street and a slightly busier street.
- To be implemented where speed is an issue.
- Line of sight should be available between all approaches
- Different surface typology can be used for the table top. This can be used in conjunction with “intersection repair” tools.



3.5
TOOLS FOR CROSSING THE STREET

At intersections with arterial or collector roads, Local Paths should be designed, built and maintained to provide a minimum of 50 crossing opportunities per hour.

Crossing the street should be safe, direct, comfortable and convenient. Tools for crossing the street take the form of constructed interventions located mid block or at intersections. Tools for crossing the street also reduce traffic speeds. To ensure people can safely cross arterial roads without too much delay, a minimum target of 50 crossing opportunities (either signalled or unsignalled) per hour is required, but the preferred number is 100 crossing opportunities per hour. It is important to take into consideration that crossings may affect arterial road traffic and may not be feasible in all locations.

Offset Intersection Crossing

Zebra Crossing

Courtesy Crossing

Kerb Build-outs

Pedestrian Refuge

Courtesy Crossing

Signalised Crossing

Offset Intersection Crossing

Where a Local Path crosses an arterial road with a wide median, it is possible to implement a bidirectional cycleway within the median. This cycleway would be protected by small buffers either side. This allows bicycles to cross only one lane of traffic at a time.

Design Considerations and Recommended Usage

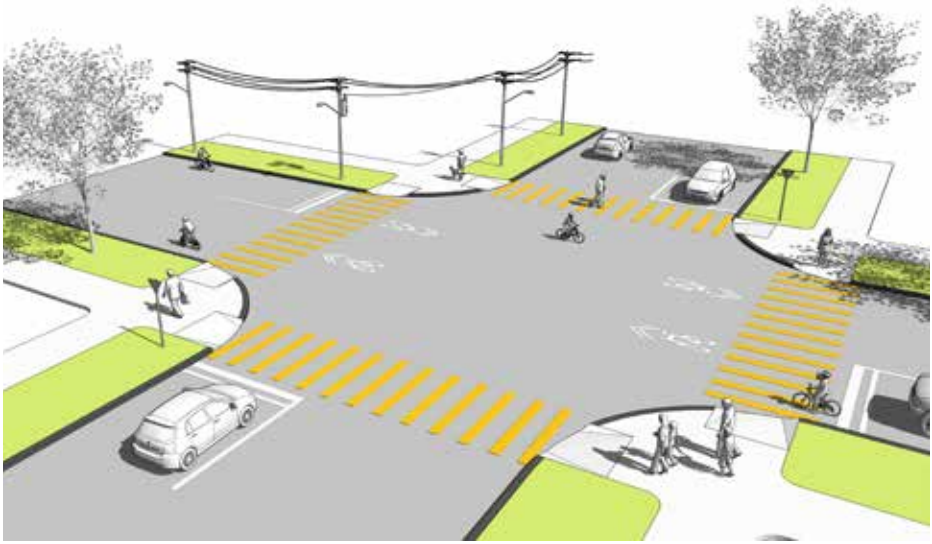
- Ensure enough space is available
- A central cycleway limits vehicular turn movement in the side streets
- Carefully consider pedestrian movement to prevent pedestrian/bicycle conflicts.
- Can be combined with a zebra crossing
- Additional traffic calming features might be required

Zebra Crossing

Zebra crossings are marked by white painted stripes across the road and flashing amber beacons or reflective discs mounted on black and white poles. Zebra crossings can be an effective way to reduce vehicle speeds and raise awareness while significantly improving pedestrian amenity.

Design Considerations and Recommended Usage

- Recommended to be used in areas with high pedestrian traffic such as around schools and town centres or major transit stops.
- Series of zebra crossings potentially improve the safety record, as drivers will be expecting zebra crossings.
- Do not install on sharp turns or steep grades.

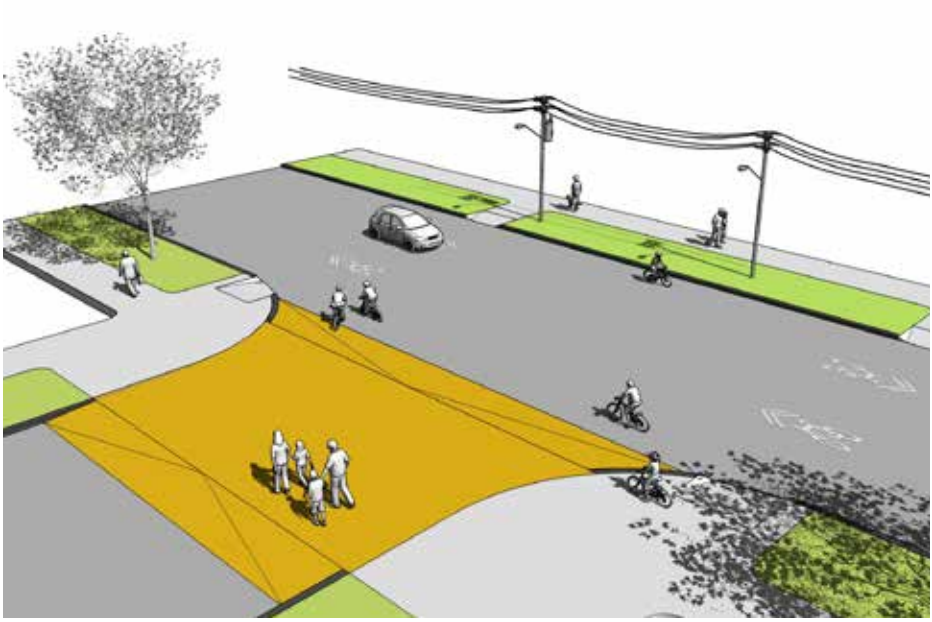


Courtesy Crossing

A courtesy crossing is a platform that provides for pedestrians crossing on the approach to an intersection. A raised crossing reduces the vehicle approach speed and provides a flush crossing point for pedestrians. This tool creates a visibly prominent crossing location for bicyclists and pedestrians.

Design Considerations and Recommended Usage

- Can be used to introduce the slower zone of the Local Paths.
- Recommended for locations that do not meet the zebra crossing warrant but where additional pedestrian amenity is desired.
- Keep in mind that vertical deflection is not comfortable for bus passengers and may be met by some resistance if this is on a bus route.

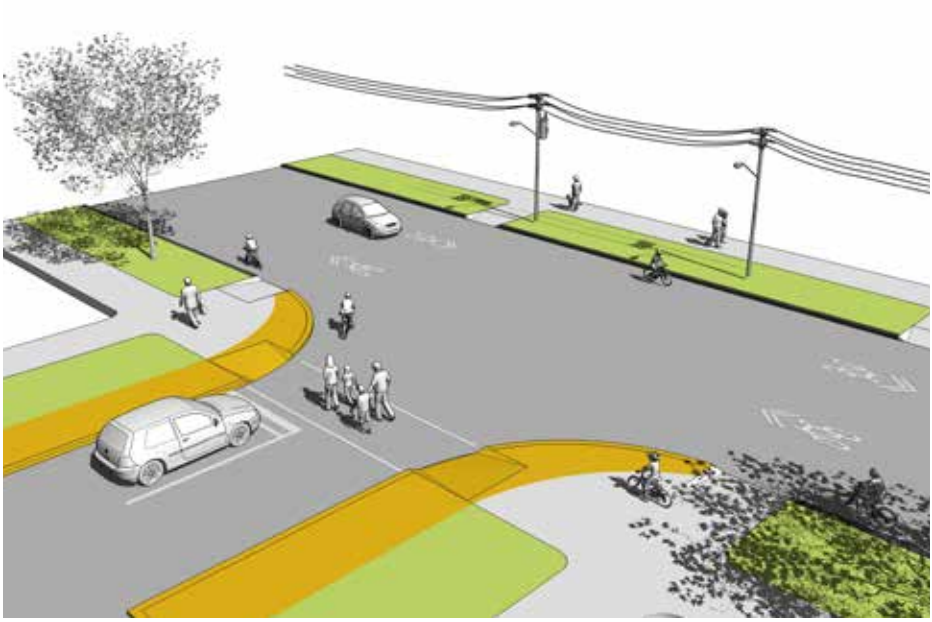


Kerb Build-outs

Kerb build-outs are useful in reducing vehicle speeds, as they physically narrow down the carriageway and increase awareness of drivers. Kerb build-outs are a commonly used tool for pedestrian crossings and are often implemented as part of safer schools programmes.

Design Considerations and Recommended Usage

- Install at intersection, to denote a gateway to slower zones or mid-block crosswalks
- Used as "book-ends" to highlight the location of the Local Path to approaching drivers.
- Kerb extensions offer opportunities for native low planting to increase permeable surface.
- If the street is frequently used by larger vehicles, such as (school) buses and trucks, modify the design to accommodate these.

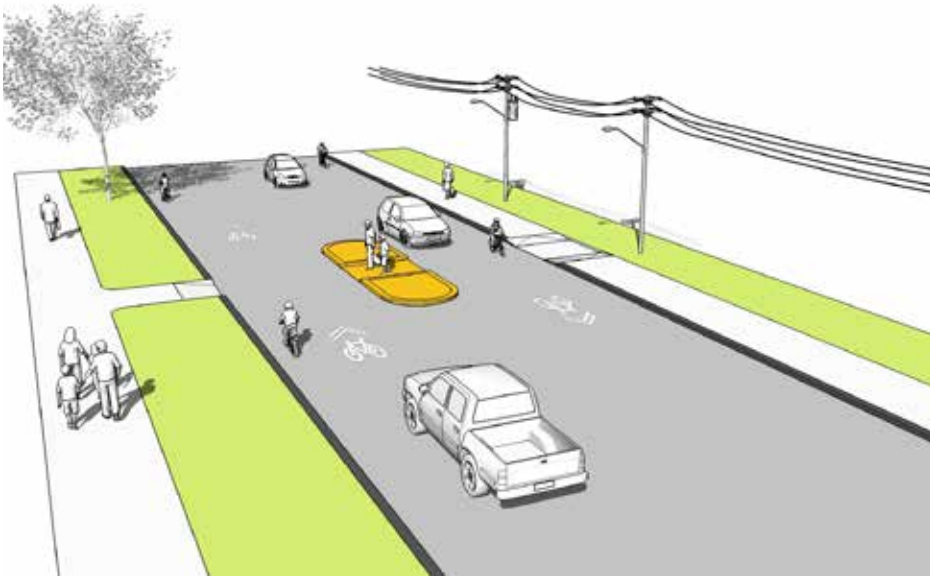


Pedestrian Refuge

Pedestrian refuges reduce the time a pedestrian in the intersection is exposed to traffic. While pedestrian refuges are generally applied at locations where speeds and volumes make crossings prohibitive or where three or more lanes of traffic make pedestrians feel exposed or unsafe in the intersection

Design Considerations and Recommended Usage

- Particularly useful in locations with relatively high vehicle flows but acceptable speeds.
- The roadway must be wide enough to accommodate the crossing island, two-directional travel, and bike lanes if used. This may require elimination of on-street parking and/or travel lanes, or narrowing of travel lanes.



Courtesy Crossing

Courtesy crossings are crossings where pedestrians do not have legal right of way, but they do highlight a good place for pedestrians to cross. A painted threshold signals a change in environment from busier, faster arterial roads to slower, local streets. There is no formal requirement for vehicles to give way to pedestrians.

Design Considerations and Recommended Usage

- Where the amount of pedestrian usage does not necessitate a zebra crossing, courtesy crossings can be used to increase safety for desire lines, especially where desire lines do not align with intersections.
- Only to be used in low speed environments with a considerable number of pedestrians crossing.

Signalised Crossing

An effective, yet expensive option to reduce traffic speeds and volumes is to signalise intersections on the Local Path. While this is often not an appropriate treatment for a quiet residential street, it can be a good solution for a major arterial road. A signalised intersection can be implemented while at the same time restricting some movements.

Design Considerations and Recommended Usage

- Recommended to be used in locations with high pedestrian crossing demands, high numbers of vehicles, and locations where motorists use secondary roads or residential side streets instead of the intended main roads (cut-through traffic).

3.6
SIGNAGE & PATH MARKINGS

The segregation of users and the use of too many signs and markings can give the perception that there is low risk of an accident, which typically reduces the attentiveness of a person using a Local Path and their awareness of other users. This can create complacency and increase the likelihood of users having an accident with one another. Research and several international examples suggest that reducing the number and size of signs and markings has the counter-intuitive result of reducing accidents by heightening a user's sense of awareness of others. By using tools such as traffic calming and water sensitive design devices, streets can become self-explaining.

Signage and street / path markings are cost-effective yet highly-visible treatments that, when used sparingly, can improve the safety and experience on a Local Path network.

Shared Path Markings

The segregation of users and the use of too many signs and markings can give the perception that there is low risk of an accident, which typically reduces the attentiveness of a person using a Local Path and their awareness of other users. This can create complacency and increase the likelihood of users having an accident with one another. Research and several international examples suggest that reducing the number and size of signs and markings has the counterintuitive result of reducing accidents by heightening a user's sense of awareness of others. By reducing or even removing signs and markings, users of a street or park tend to slow to the pace of the slowest mode, typically a pedestrian, which helps to facilitate the different users of the space, be it a pedestrian and cyclists or vehicle and cyclist, to interact with one another through eye contact so that they can determine between themselves who has right of way.

1_ Standard

2_ Single Chevron

3_ Band

4_ Double Chevron

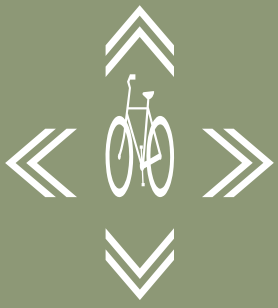
Street Markings

The primary marking for Local Paths is the shared roadway marking, aka 'sharrow'. The sharrow is a bike symbol with a double chevron on top. The chevron can be rotated to the right or left side to indicate changes of direction, if turn sharrow markings are not used. Multiple chevrons can indicate crossing choices.

Design Parameters

- Sharrow legends are placed 10 - 15m from major cross streets and spaced at up to 75m intervals after that initial marking.
- Opposite-direction sharrows are typically placed at the midpoint of the first direction such that alternating directional sharrows are encountered every 30 - 40m along a Local Path
- In advance of a direction change or decision point along the Local Path, the last sharrow will use the directional chevron to inform cyclists of the change of direction, or a pending decision point, where the Local Path intersects another bikeway.

Standard Sharrow



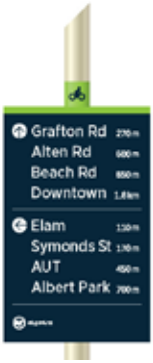
Sharrow Flower

Turning Sharrow

Wayfinding Signs

Wayfinding signs are typically placed at key locations leading to and along Local Paths, including where multiple routes intersect and at key bicyclist "decision points." Wayfinding signs displaying destinations and distances can dispel common misperceptions about time and distance while increasing user ease and accessibility to the Local Path network. Wayfinding signs also visually cue motorists that they are driving along a bicycle and walking route and should correspondingly use caution. It is important to note however that too many road signs tend to clutter the right-of-way and become invisible to regular users.

Direction



Marker

Link

Route Marker

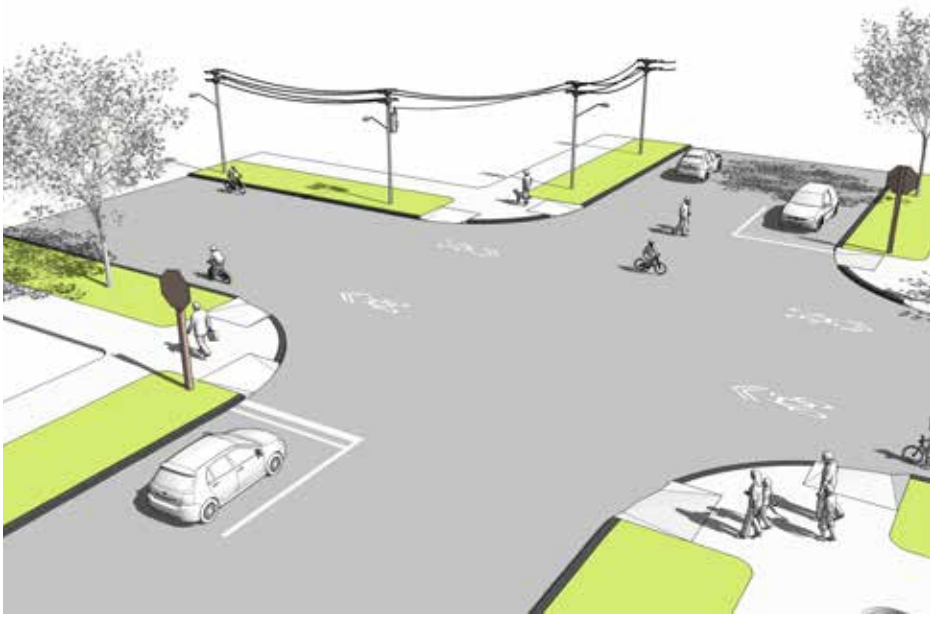
Fingerpost

Change Priority Signage

One way of prioritising a Local Path route over a side street is to ensure the side streets have stop signs at the intersections with the Local Path. This reduces the stop/start delay for bicycles while at the same time reducing intersection approach speed and allowing for eye contact between road users.

Design Considerations and Recommended Usage

- Special care needs to be taken at streets that serve a 'cut-through traffic' function, as prioritising the vehicle traffic will encourage its use.
- Speed management tools should also be implemented.
- Stop signs are better at reducing vehicle speeds than give way signs
- The Local Path should be highlighted on the through road using sharrows.



Advanced Warning Signs

Inform motorists to expect cyclists and passively markets the Local Path network. Warning signs advising motorists to “Share the Road” may improve cycling conditions on the Local Path network.

Recommended Usage

- Near major bicycle trip generators such as schools, parks and other activity centers.
- On major streets approaching Local Paths

Use Bell on Approach

Slow - Keep Left