

Chapter 2

**Integrated
Transport
Planning**

2 Integrated Transport Planning

2.1 Introduction

The Auckland Transport Code of Practice (ATCOP) is a key document to guide the requirements of transport and land use integration in terms of how components of transport infrastructure are organised, located and designed to support interactions and connections on and between the street / road and interfacing land use. Future subdivisions and other major developments throughout the region will need to provide for sustainable transport modes as the balance between the various modes of transport is shifted to prioritise for pedestrians and/or provide for other modes such as public transport and cycling. In these areas, locations or spaces where the land uses will need to be supported by a re-balancing of movement and place priorities.

Throughout ATCOP the themes of integrated planning, sustainability and urban design are endorsed. Sustainability and urban design principles are important considerations for each chapter of ATCOP to ensure that sustainability measures and quality design outcomes are always taken into account and integrated for every transport project.

2.2 Integrated, Co-ordinated and Sustainable Approach

Transport networks experience many pressures with a growing population and with additional demands and expectations. They often help define the built form around which society exists and moves and can, when designed appropriately, contribute immensely to the feeling of 'place'.

“Better designed streets contribute significantly to the quality of the built environment and play a key role in the creation of sustainable, inclusive, mixed communities.” *Manual for Streets* - first published in 2007 for the Department for Transport UK.



Example of an arterial road that could be improved to better support the 'place' function at this location

The function of a street is related to its context and knowing this assists AT to deliver the appropriate transport network response.

To achieve greater efficiency, while at the same time improving accessibility opportunities, Auckland Transport supports an integrated, co-ordinated and sustainable approach in the planning and provision of transport facilities and services and how these networks will blend with the existing local environments.

Integrated transport planning is a process to identify current and future access needs – for people, goods and services – and inform decision makers, key stakeholders and the community on how to manage the transport system and land uses to best address these needs.

It aims to do this in a way that sustains economic growth, supports the quality of life of current and future generations and sustain the environment. These are significant outcomes which are being sought by the Auckland Plan.

Integrated transport planning allows planners of the transport system to find a balance between the competing uses and demands on the transport system and be sensitive to adjoining land uses and places (such as town centres, business parks, open spaces and residential areas).



Streets can, at certain times, cater solely for 'place' function e.g. to support community and business events

The integrated approach to transport planning requires:

- A focus on achieving multiple outcomes
- Solutions that can perform well in a range of possible futures
- Planning transport and land use together and iteratively
- A focus on access (to people, places, goods and services) and mobility
- planning one transport system that capitalises on the strength of each mode
- making the best use of existing infrastructure and services first
- collaborative planning based on achieving good system-wide outcomes
- engaging and developing partnerships with stakeholders

The integrated planning approach requires a good understanding of how the city and region works. As well as transport issues this includes the dynamics of population and economic growth, environmental issues, open spaces and heritage, community infrastructure and social issues – all at the regional, city-wide and local levels.

The process illustrated below in Figure 2, represents all interests in the transport network, the importance of place and the emphases between different types of movement.

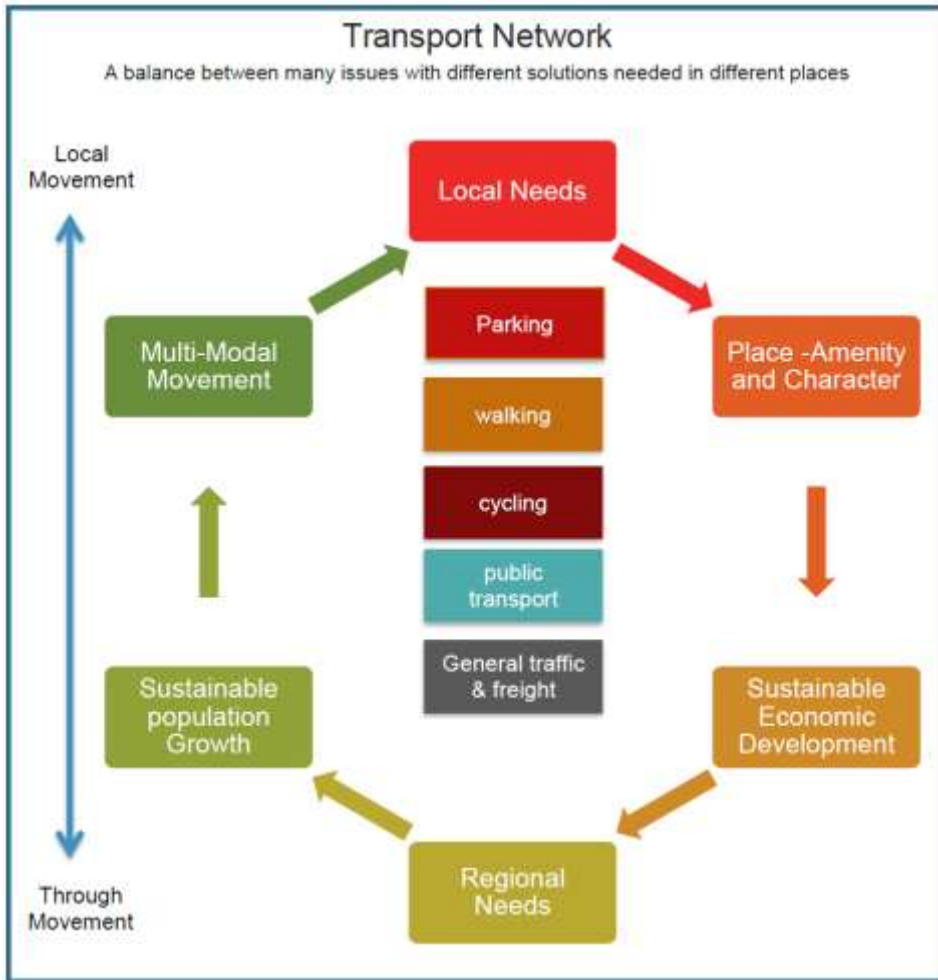


Figure 1: Transport Network Process

It is important that all Auckland Transport’s roles and responsibilities are appropriately considered in developing an integrated response to land use changes. For example, the Strategy and Planning group co-ordinates Auckland Transport’s response to plans such as District/Unitary Plan, Area Plans, Notices of Requirements and Major Development proposals. The Road Corridor Operations group co-ordinates responses to site-specific resource consent applications.

The following sections outline the key ways Auckland Transport will manage the transport system with land uses.

2.3 Directive and Principles from the Auckland Plan

The directives and principles contained in the Auckland Plan provide guidance of how the Auckland transport system should be managed.

Directive: Manage Auckland’s transport system in accordance with the principles and review existing policies to reflect Auckland’s single system transport approach.

Principles – Land Use and Transport

1. Use a single system approach in the planning, design, management and development of our transport system (motorways, state highways, arterial and local roads, freight, rail bus and ferry services, walking and cycling, ports and airports).
2. Use travel demand management techniques, such as travel plans for schools and businesses, to manage the growth in demand for private vehicle travel and improve the way existing infrastructure networks operate, before providing additional capacity to the transport system.
3. Achieve the appropriate balance between movement and place, considering capacity (incorporating the safe movement of people and goods), and character (recognising the role of road/street in the urban setting and types of buildings/landscape present or planned), and acknowledging the role of transport to assist in place – shaping.
4. Ensure that long - term land use and activities drive long - term transport functionality, (taking into account the existing and proposed transport network), and that transport investment aligns with growth as envisaged in this Plan.
5. Optimise existing and proposed transport investment.
6. Establish corridor management plans that account for place – shaping.
7. Recognise existing community investment and the need to enable connectivity between and within communities.
8. Align community expectations in urban areas with urban levels of service, particularly with realistic expectations around levels of congestion.
9. Align community expectations in rural areas with rural levels of service, particularly acknowledging limited opportunities for alternatives for motor vehicle travel.
10. Ensure that transport is sustainable in the long term, minimises negative impacts on people's health and the built and natural environment, and reduces our dependence on fossil fuels.
11. Improve the capability of the transport system to withstand adverse events.

2.4 Transport response to Auckland Plan

The Auckland Plan's vision is for Auckland to be "the world's most liveable city" by 2041 and it identifies the transport system as critical to achieve its vision. The Auckland Plan contains strategic directions, priority projects and performance targets that are specifically related to the levels of service and travel modes provided by the transport system.

The Auckland Plan aims to ensure land is released for development to meet growth demands while efficiently synchronising this with social and physical infrastructure and other services. This will require phased and sequenced investment by the transport network providers – Auckland Transport, the New Zealand Transport Agency, KiwiRail, the Ports of Auckland and Auckland Airport.

If network providers are to deliver this investment effectively and efficiently they will need to optimise the way their networks are maintained, managed and improved as a single, integrated system.

In response, Auckland Transport has developed an Integrated Transport Programme (ITP) which sets out a transport programme for the 30 year period to 2041 that integrates the major projects prioritised in the Auckland plan with a supporting programme of investment in transport infrastructure and services.

The ITP provides an integrated view of the transport investment programme across the transport system, including state highways and local roads, railways, buses, ferries, footpaths, cycle ways, intermodal transport facilities and supporting facilities such as parking and park-and-ride.

The ITP has been produced by Auckland Transport and the New Zealand Transport Agency with input and support from Auckland Council. It responds to the strategic vision, outcomes and targets of the Auckland Plan and to the government's wider transport policies.

The purpose of the ITP is to coordinate the investment and other activities of Auckland's transport network providers to ensure these contribute effectively and efficiently to meeting the growth and development needs of Auckland and its adjacent regions over the next 30 years.

In particular the ITP will:

- Guide network providers in their detailed planning activities for maintaining, operating, renewing and developing their transport networks
- Help to phase and sequence detailed programming of activities through the Regional Land Transport Programme process
- Communicate how the vision and targets of the Auckland Plan will be addressed for each of the 10-year periods to 2041 and what this will mean in terms of transport network development and service levels.

Figure 3 summarises the role of the ITP within the overall transport planning framework for Auckland. The first version of the ITP follows publication of the Auckland Plan and has been produced in the light of current information. Subsequent versions of the ITP will respond to changing policies, funding availability, growth and development trends, service level requirements, asset condition and programme costs.

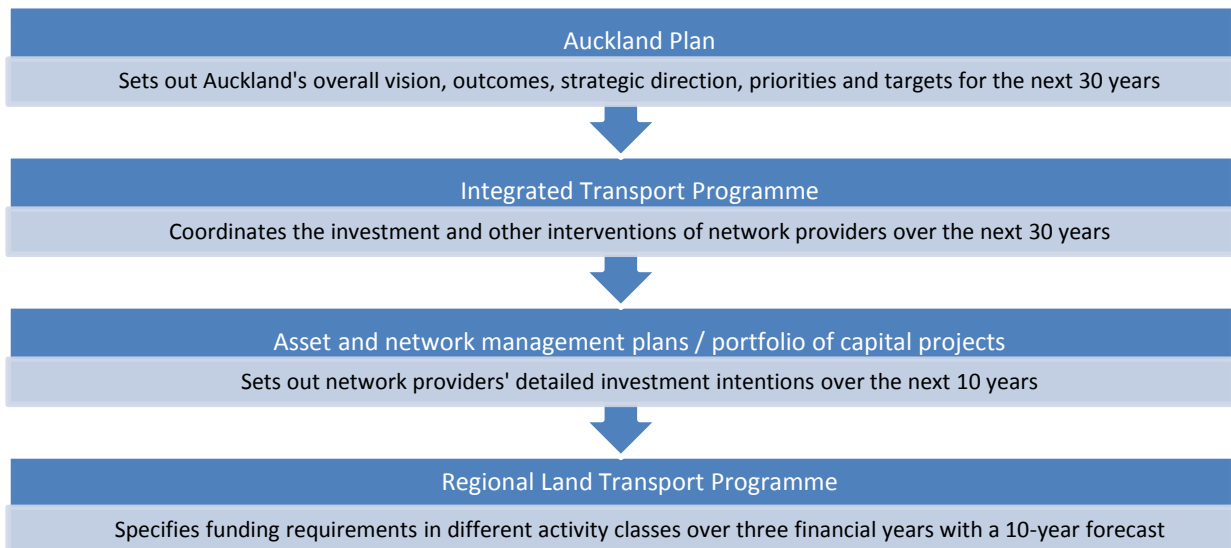


Figure 2: Role of the Auckland Integrated Transport Programme

2.5 One system approach

The ITP promotes the One System approach to better manage and plan the use of the transport networks with land use development, at all levels of planning as required by the Auckland Plan. The approach involves the key stakeholders agreeing a collaborative view of strategic intent for the Auckland region and how this is delivered by transport.

The One System approach will result in:

- Better use of existing infrastructure
- Better alignment with changing patterns of land use and demand
- A safer, more resilient national and regional network, where a greater range of resources and options is available to deal with unexpected events or future changes
- Better alignment of effort between network providers and elimination of overlap and duplication.

The One system approach is illustrated in Figure 4 below:

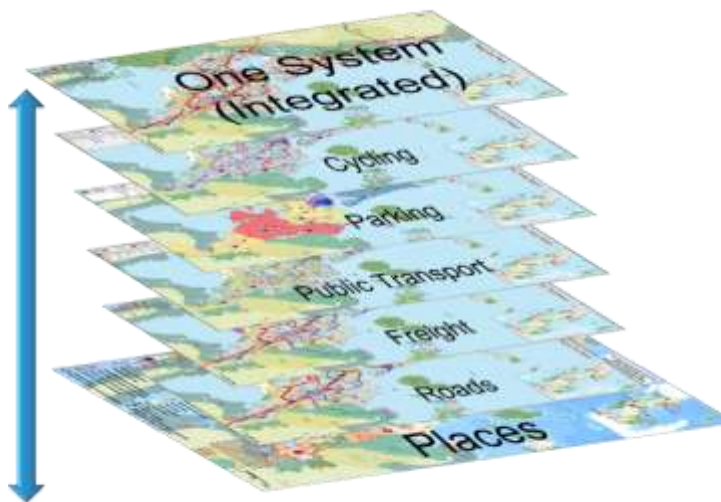


Figure 3: One System Approach

2.5.1 Different levels of intervention

At the strategic, region-wide level, the ITP responds to the vision, outcomes and targets of the Auckland Plan and the government’s wider transport policies. It is based on the 30-year land use development and transport investment scenario from the Auckland Plan.

At the network-wide level, individual network plans define the demands, priorities and future development for each mode (strategic and arterial roads, public transport, freight, cycling and walking, parking) over 10 years. The demands and priorities between the different networks and places are integrated and balanced, based on the strategic direction outlined in the ITP and the Auckland Plan.

This guidance directs the priorities for the development of other tactical and operational transport network activities, including:

- *corridor management plans (based on individual arterial roads or groupings of arterials)*
- *transport response to growth in metropolitan centres and other centres*
- *major integrated, multi-modal infrastructure projects (such as AMETI and SMART)*
- *network operating plans, which translate the strategic direction into the day-to-day operation of the network.*

At all stages, stakeholders agree what is expected of transport, how and to whom priority is assigned and what the effects are of a variety of interventions on the network. Thus the process is also an engagement and agreement framework giving clear, consistent and informed decision making.

Two examples of the One system approach are outlined in the next sections.

2.5.2 Corridor Management Plans

The development of Corridor Management Plans (CMPs) is a multi-disciplinary approach to network and street design taking into account the movement and place functions of roads. This enables guidance on arterial corridors to be developed on a case by case basis. The CMP process is led by Auckland Transport in collaboration with Auckland Council. CMPs are also used to support Auckland Transport input into Auckland Council-led planning initiatives such as master plans, area plans or precinct plans. For this reason, Auckland Transport will make every effort to align its CMP programme with Auckland Council planning initiatives, subject to CMP programme priority.

The CMP process builds on previous work from legacy councils that seek to balance the demands of people/vehicle movement with place making. Corridor typologies have been developed to provide a range of different street design treatments depending on the influence of movement and place issues along the corridor, which will also vary over the length of the corridor.

The road classification and the road corridor segment typologies are considered side by side so that for each road classification category there is a corresponding range of segment types guiding the design provision for it. This approach ensures that place and movement functions are considered in combination, with their relative importance depending on the classification of the street or corridor in the network. This is illustrated below in Figure 5.

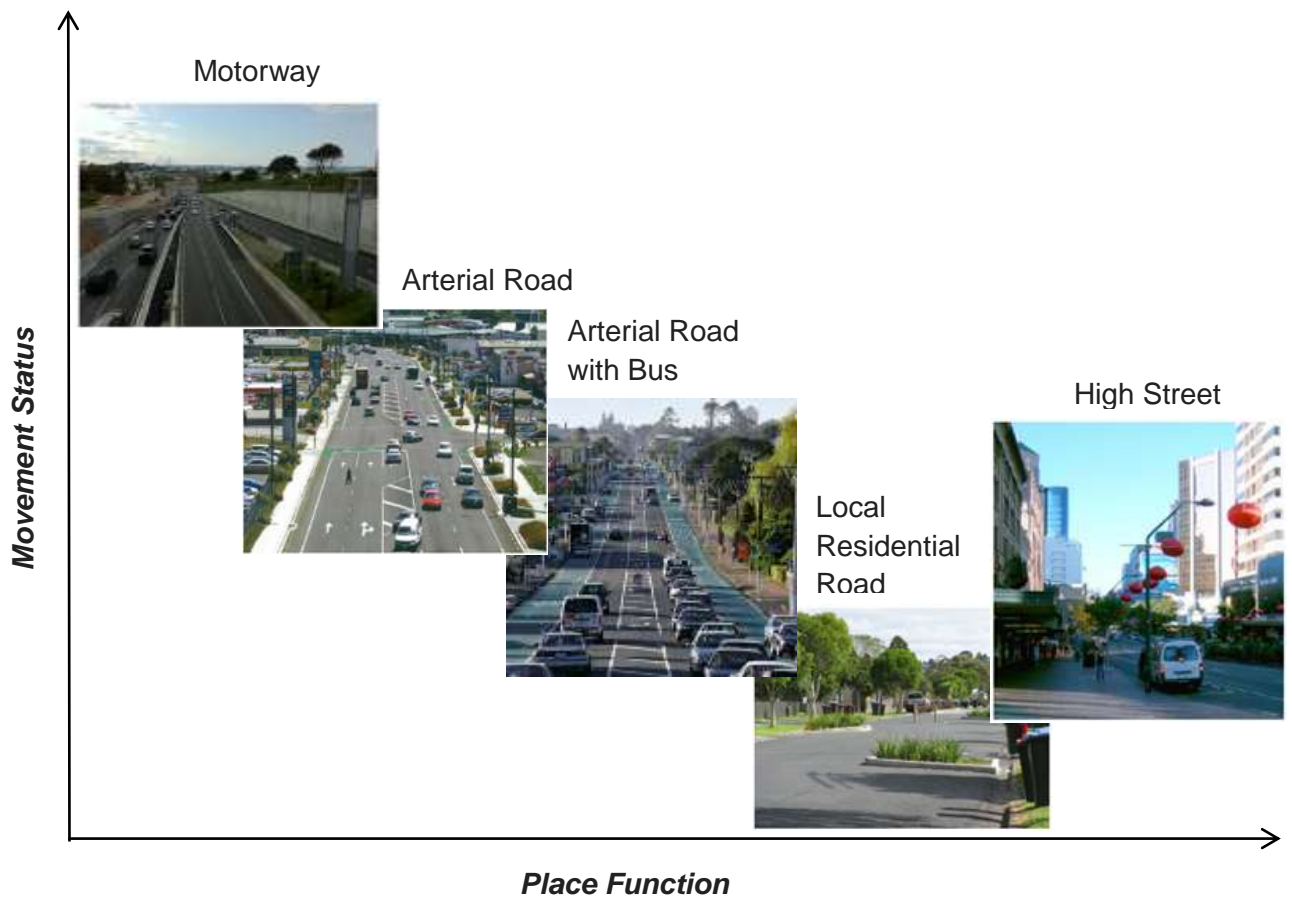


Figure 4: Different Transport Environments

In the context of region-wide strategy, CMPs provide the localised strategic direction for the development of a corridor in response to changes over time. It is important to note that CMPs will not be the determinant of land use/s alongside a corridor and that this is the role of Auckland Council. However, the CMP process will consider all known land-use information (from District Plans, the Unitary Plan, Area Plans, Master Plans, Precinct Plans, known major private development aspirations etc.) and include it as an input into the CMP process.

One of the measures of a successful CMP will be how effective and efficient it is at responding to land-use changes over time. CMPs are living documents that can be reviewed and, if necessary, updated on a medium-term basis.

CMPs set out a prioritised list of projects and their triggers or suggested timing, to guide stakeholders as to likely corridor changes and requirements into the future. These lists of projects feed directly into Auckland Transport’s future works programme.

To ensure there is a consistent approach to the development of CMPs, Auckland Transport has developed [CMP Guidelines](#) (PDF 1.6MB) in collaboration with key partners. The process is described in detail in the CMP Guidelines, which are accessible via the embedded hyperlink.

A summary of the CMP Guidelines process is presented below in Figure 6:

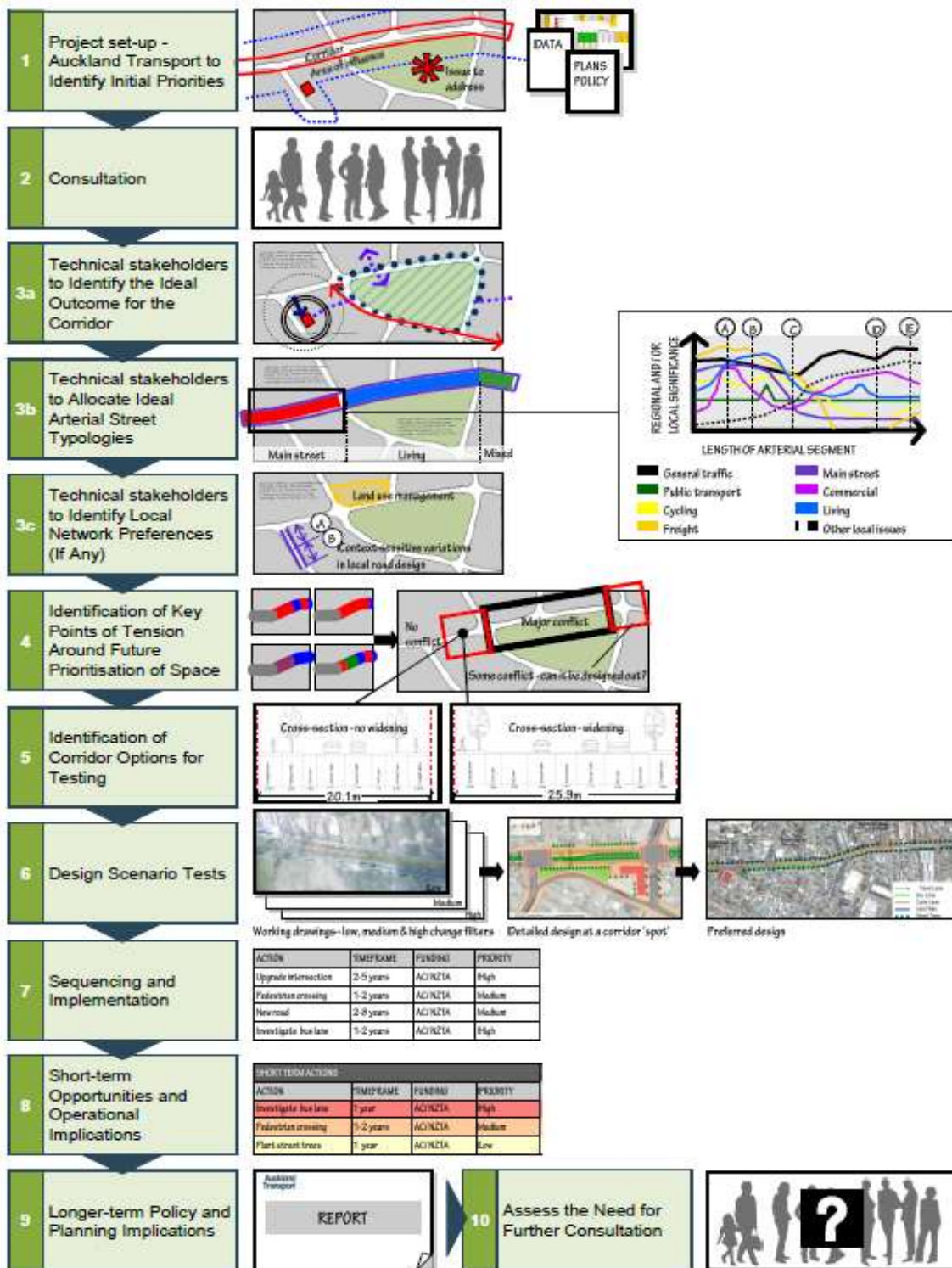


Figure 5: CMP Guidelines Process

2.5.3 Network operating plans

Network operating plans assist in the development of CMPs and provide operational guidance for a corridor in the absence of a CMP. Network operating plans are an example of how the One System approach integrates and optimises transport networks. Network

operating plans are a new key planning and operational tool to inform decisions and to link those decisions to both strategic objectives and operational interventions. It also enables users to make informed travel decisions in relation to how they see the network developing and being operated. It involves a 3-step approach described below in Figure 7

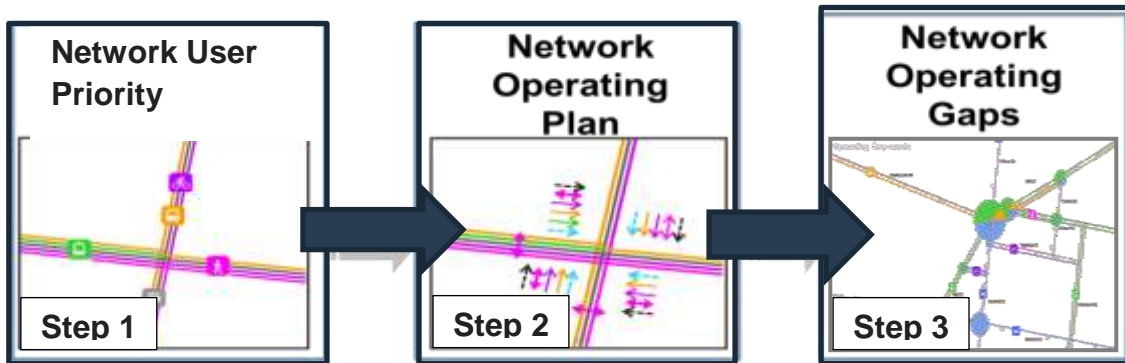


Figure 6: Network operating plan process

Step 1 – Establish transport user priority

The 10-year network plans (strategic and arterial roads, freight, public transport, cycling, parking) establish the high level priority for transport users for each of these modes. Tools such as ‘deficiency analysis’ prioritise the competing user demands between the different modal networks and the liveability needs of places served by the networks. A network user priority map is developed from this process.

Step 2 – Develop network operating plans

Network operating plans for sub-areas of the Auckland region are developed in more detail, with the network user’s priorities indicating the mode and place priority along roads. This allows the movement and place-making functions of the network to be balanced and prioritised in finer detail, depending on the time of day, the mode and the location. These plans reflect the strategic intent developed and agreed in step one and are a graphical network representation of the transport network that will deliver the strategies used in step one.

Step 3 – Identify operating gaps and address them

A workshop-based assessment can be undertaken to compare the performance of the network today versus the future network state that is needed to deliver the strategic intent. The difference, or Operating Gap, is visually displayed by the tool. These operating gaps are the focus of attention in developing interventions to address the performance gaps.

The One System approach will be progressively applied to optimise the networks. Auckland Transport is currently working with NZTA and other transport providers to develop detailed network user and place priorities for the One System across the entire network. This will be updated as the One System network optimisation process is completed.

2.5.4 The Four Staged Intervention

In order to derive the greatest benefit from transport investment and to meet the transport targets and outcomes for Auckland, a four-stage intervention process has been developed to enable the ITP to prioritise the phasing of Auckland's 30 year transport programme. The 30 year transport programme for Auckland is categorised by four functional areas which make up the intervention:

Operate, maintain and renew infrastructure optimally: Existing assets need to be maintained, repaired and renewed to ensure they are fit for purpose, minimise whole of life costs and avoid unacceptable risks associated with inadequacy of transport assets and services. Projects in this category relate to the day to day operation of the network and public transport services, renewal of assets to restore levels of service management plans and maintenance activities.

Make better use of networks: Experience with managing the transport system suggests the best returns from investment can often be achieved through optimal management and use of existing assets. Examples of network optimisation activities include: safety schemes; changes to clearways and other parking management measures; "tuning" traffic signalling systems; speed limit reviews and minor upgrades to existing arterial roads and local roads.

Manage demand efficiently and safely: Transport demand management refers to measures which change travel behaviour such as pricing, taxes, use of speed and red light cameras, parking charges, statutory planning controls that are not based on infrastructure solutions but on policies, regulatory levers and incentives.

Invest in new infrastructure, services and technology: Major transport improvements will be crucial to meet increasing demand associated with growth, and to maintain good levels of service for freight and commercial vehicles. The ITP maintains the Auckland Plan's priorities for major network improvements which are the: completion of the Western Ring Route, upgrade of public transport infrastructure and introduction of electrified rail services; the City Rail Link, the Auckland-Manukau Eastern Transport Initiative (AMETI) and the East-West Link, and the additional Waitemata Harbour Crossing.

Design, plan and develop a connected and accessible street networks and paths. This better supports the appropriate intensification of land uses and provides the platform for supporting public transport, walking and cycling as efficient and effective modes of movement, as well as creating more legible and adaptable urban environments.

This approach will enable the ITP to be refined and optimised so it achieves the best value for money from previous and new investments in terms of the level of service it delivers. Figure 8 outlines the four-stage intervention process.

(Please refer to the ITP for a broad outline of this integrated approach).

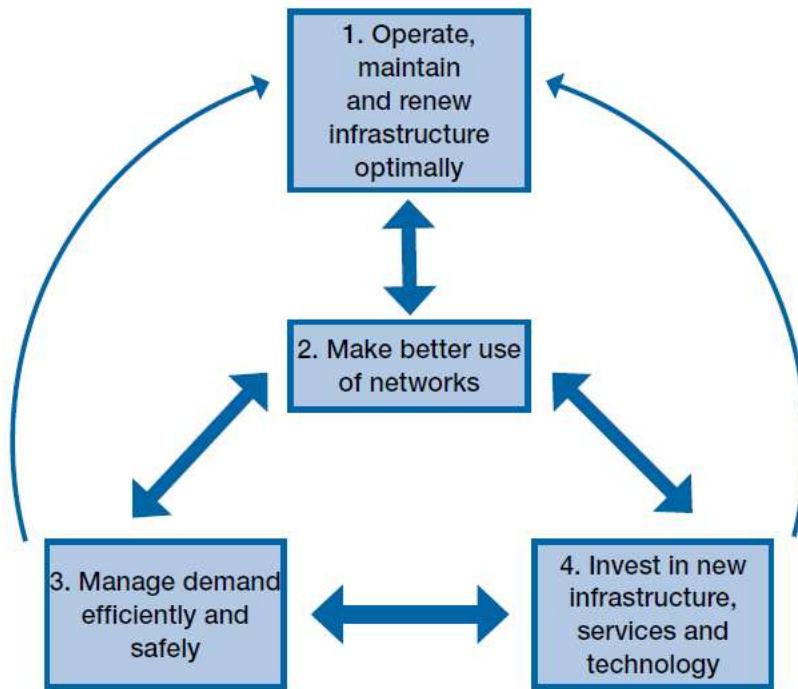


Figure 7: Four-stage intervention process

2.6 Urban Design

In its most basic form, the integration of transport and land planning use is a process. It is a process that influences how different communities and places look, feel and function over time. The way in which communities and businesses are able to make use of land will almost in all cases require moving people, carrying goods or delivering services. The use of land and the inherent requirement to travel and move within and between places can be for economic, social or cultural reasons.

The places which result from the process of integration will in turn form part of the physical resources which contribute towards Auckland’s wider social, economic and environmental aspirations. These aspirations are outlined in the Auckland Plan.

As a process, transport land use integration is about bringing together the movement function of the transport system with the places that these movements serve. The transport system comprises both infrastructure and services that enables the movement of people, goods and services by public transport, walking, cycling, private vehicles and freight vehicles. The movement between places are produced by people wanting to get to other people and land uses.

The purpose of transport land use integration is to bring together these two elements in a way that results in benefits for both the transport elements and the places these movements serve. These benefits can include the ease of getting from one place to another, enhancing

the way that places look and feel and providing the environment and facilities to grow economic activity.

The relationship between transport networks and land use can potentially be supportive and positive or conflicting and negative. The better connected a place, the more desirable it is for people. Integration seeks to optimise the supportive relationship and minimise the conflicts.

The process of integration requires a holistic approach and collaboration across a number of areas at different spatial levels –

- Regional e.g. Auckland Plan, Regional Public Transport Plan
- Sub-regional or area based e.g. City Rail Link (CRL), the Auckland-Manukau Eastern Transport Initiative (AMETI) and the South western Multi modal Airport Rapid Transit (SMART)
- Centre based e.g. New Lynn, Newmarket and Takapuna
- Street or corridor e.g. Corridor Management Plans and shared space projects

At all the levels identified above, transport and land use integration involves the planning and implementation of land use patterns where the respective transport and land use elements are mutually supportive of one another while contributing to wider community outcomes (economic, social, environmental and cultural). Some of the key considerations and principles which underpin a robust approach to transport and land use integration include the following:

- Develop a compact well designed and sustainable urban form which is supported by an integrated multimodal (private vehicles, public transport, walking and cycling) transport system
- Improve, manage and operate the region's transport system including road, rail, ferry, bus, cycling and pedestrian networks and services in a manner that supports urban development and land use intensification
- Encourage land use activities to develop in locations that reduce the need for motorised trips, supports public transport, walking and cycling.
- Locate economic activity to maximise the efficient movement of goods and services.
- Ensure that the design of streets and transport infrastructure contributes to quality liveable environments, and takes account of the different roles and character of particular locations
- Encourage land use activities and urban design that reduces the exposure to adverse effects from transport activities.
- Recognise and provide for the multi-functional role of transport corridors, in conjunction with their transport functions.
- Discourage high trip-generating activities from developing in locations where transport options are limited, or where there are adverse effects on the safety and efficiency of the transport network.

Potential benefits

Successful integration which results in positive outcomes can lead to the following benefits (among others)

- The reduced use of non-renewable resources through requiring less and more efficient travel patterns.
- The improved quality of public health and general wellness and safety by encouraging walking and cycling journeys.
- The efficient use of limited road and network resources by supporting improved levels of people carrying capacity (rather than vehicle carrying capacity).
- The improved economic productivity of land resulting from clustering of activities serviced by a range of good quality transport choices.
- The improved economic and social benefits of reduced congestion and reduced trip lengths.
- The provision of travel options enables access to economic (e.g. employment), and social (e.g. for the young and elderly without access to a private vehicle) opportunities



Shared zones in the city centre provide space for social exchanges at pedestrian pace as well as supporting economic exchange - delivers and retail shopping.



Well designed, safe, functional, with good quality material in the street interface with well designed private development

2.6.1 Auckland Transport's Urban Design Principles

Auckland Transport seeks to install a consistent “look and feel” to its entire transport infrastructure. Some key elements that will contribute towards this consistent “look and feel” are :

- Consistency of common design elements provided collectively impact a recognisable Auckland Transport trademark;
- Designs identify with the history and culture of an area and link this history and culture to the current transport use; and
- Consistent levels of service of common elements such as weather protection, cycle facilities, integrated and functional art, seating, waste management, public toilets, wayfinding signage, Auckland Transport branding etc. and the day to day place management.

Guiding urban design principles for ATCOP have been developed using a number of best practice documents including, but not limited to, the Ministry of the Environment's - New Zealand Urban Design Protocol. **The AT urban design principles must be applied to all relevant AT projects.**

The physical design outcomes that AT must achieve for every project are the following:

- The project and the networks, of which it is a part, must fit sensitively within the built, natural and community environments through which it will pass.
- Street planning and design must contribute to the accessibility and connectivity of communities and a general permeability of movement through areas.
- The design and management of streets must contribute to the overall quality of the public domain for the community, including all road users.

These physical design outcomes need to be achieved in a cost-effective, safe and sustainable manner.

2.6.2 Urban Design Process

Urban design must be considered early and integrated into the project at the initiation phase.

The continuing involvement of urban design should be maintained through the development, implementation and finalisation phases.

In particular:

- Street network area, transport facilities and corridor strategies should consider the future character and form of the network or route within their context.
- Route or project selection should integrate urban design criteria into the options assessment process.
- The development of a project's concept design should integrate engineering and urban design.
- The detailed design should be in accordance with the project's agreed urban design scope and quality.

2.6.3 Responsibilities for Urban Design

Achieving good design is a collaborative effort both within project teams and across AT. It involves many areas of expertise, including project management, asset management, environmental and landscape management, road operations and safety teams, community planning and liaison, urban and regional planning, health & safety and road design.

2.6.4 The 7 'Principles'

While some of the principles listed below incorporate the "Seven C's" (New Zealand Urban Design Protocol, Ministry of Environment of which Auckland Transport is a signatory to the protocol), it is important to note that the following set of urban design principles has been specifically developed for all AT projects.

All AT projects must be reviewed to ensure that they fit with the following 7 principles:

1. Fitting into the built fabric
 - Consider the role of networks in the structuring of neighbourhoods, towns, cities and regions.
 - Consider transport, surrounding land-uses and community needs in planning and designing street networks and hierarchies.
 - Create streets and boulevards that provide a sense of place by keeping the footprint of the street to a minimum.

- Minimise adverse impacts (including visual and noise) in the planning and design of all streets.



Art work as part of a considered customer experience at Hobsonville ferry wharf.

2. Connecting modes and communities
 - Consider connectivity within and through surrounding environments for all modes including walking, cycling, public transport, freight transport and the private automobile.
 - Provide a safe, accessible and convenient network of routes accessible to all people.
 - Consider connectivity between modes.
 - Consider where people want to cross and the quality of crossing points along a busy road.
3. Designing Sustainably
 - Form all streets in response to topography and landform.
 - Integrate natural patterns, systems and minimise ecological footprints in all street and transport facilities.
 - Maximise local resource-use and minimise waste.
 - Ensure physical continuity of natural systems.

- Use natural characteristics in the street's landscape design (e.g. water sensitive design)



Art integrated into a bridge as part of walkway project in Waitakere.

4. Incorporating heritage and cultural contexts
 - Preserve and integrate historic streets, buildings, structures and precincts into overall street design.
 - Adapt and re-use heritage infrastructure in projects.
 - Protect and incorporate cultural and natural heritage along the selected corridor.



Provision for all movement modes, use of high quality materials in Queen Street, city centre.

5. Designing an experience in movement along streets
 - Create/enhance the views to and from the street.
 - Provide visual stimuli within the street corridor.
 - Create a progressive sequence of visual events.



Use of locally relevant materials, quality finishes, good design and construction in New Lynn.

6. Creating self-explaining road environments

- Create streets that provide both place and movement functions along the full corridor
- Distinguish between the different functions and speeds of streets by differentiating their appearance.
- Improve the legibility of streets.



The self-explaining road trial in Tamaki. Note the local placing through community involvement.

7. Achieving integrated and minimal maintenance design
 - Use robust durable materials fit for purpose and place.
 - Provide a relatively self-reliant and minimal maintenance natural landscape.
 - Avoid opportunities for vandalism.
 - Create a simple, co-ordinated and neat composition of street elements along a corridor.
 - Consider the design quality of major street components and individual street elements.

The above 7 Urban Design Principles are supported by the following safety and accessibility principles which assist in the creation of a suitable transportation network and urban environment for all users:

Surveillance

- Getting eyes on the street;
- See and be seen
- Improving street and pedestrian activities.

Access control

- To create areas of safe movement with appropriate connectivity to the surrounding network
- Limit access to vulnerable locations

Sense of ownership

- Show that a space is well cared for and that the users feel connected to it.

Good maintenance

- Well managed and maintained environments

Equitable use

- Users of the space are generally not disadvantaged by the design and all have equal opportunities to navigate without prejudice.

Flexibility in use

- Streetscapes tend to be defined by the zones in use, such as the walking zone, street furniture zone etc. flexibility in the ability of users to deviate from the use of these zones is required to create overlap and reduce potential conflicts.

Simple and intuitive

- An intuitive design is one that all users can understand without the excessive use of signs, road markings and other complex visual aids.

Perceptible information

- The design provides visual cues as to walking zones, furniture zones and unsafe zones without cluttering the streetscape with unnecessary information.

Tolerance for error

- Humans, by nature, are fallible and prone to errors of judgement. It is important that any design has a tolerance for human error and that this error be accommodated within the designated area of the design.

Barrier Free

- While the majority of road users are able-bodied pedestrians and road users in motor vehicles, it is important not to forget that some users are not as mobile or do not have access to all five major senses. It is therefore vital that designers consider how their designs impact on limited mobility or disabled users.

Size and space for approach and use

- Human spaces are defined by the scale of buildings and the environments around them; if too big - it will feel empty and unsafe, if too small - it will feel claustrophobic and aggressive i.e. a small high street footpath will feel crowded when occupied with lots of pedestrians.
- An appropriate balance is required and is dependent on context.

All too often, designs focus on one mode of transport to the detriment and sacrifice of the ability of other users to effectively use the space. An example of this is cul-de-sacs and no-exit streets. Often the connectivity of these streets is limited by design, with no thought given to how accessibility and connectivity can be retained while still reducing or stopping the movement of other classes of user. A simple design change could be developed, often at minimal extra cost, to give pedestrian and cycle permeability through the local road network, while not adversely restricting motor vehicle access.

2.7 Designing for Sustainability

2.7.1 Sustainability and Environment Governing Guideline

Auckland Transport's Sustainability and Environment Guidelines are currently under compilation. Upon completion a link will be provided to these, which will be important to read as an essential background to the rest of this section.

For Auckland to become "the world's most liveable city" and achieve its sustainability targets, it will require all inhabitants and organisations including Auckland Transport to make a meaningful contribution.

2.7.2 Key Sustainability Targets

A number of key Sustainability targets exist in the Auckland Plan launched in 2012 alongside patronage and transport targets, including:

- 49% gross reduction in transport Greenhouse Gas Emissions within 30 years.
- Zero Waste to landfill within 30 years (Closed material and biological cycles).
- Gross water consumption reduced by 15% by 2025.
- Enhanced biodiversity.
- Reduced air pollutant emissions by 5% by 2016, and further reduction of 20% by 2040.
- Support for the national renewable energy target of 90% by 2025.



New Lynn train station

For AT, as a regionally significant transport organisation, this means all our staff and partners need to possess an understanding of these targets and have a strong willingness to assist in contributing and innovating within their teams and projects to deliver the identified goals.

AT and its partners can contribute to wider environment and sustainability objectives in the region and contribute primarily to these through:

1. Outcomes sought for the transport network, infrastructure and its use.
2. Practices & impacts during construction and through procurement processes.

<p>1. Outcomes sought for the transport network, infrastructure and its use - examples:</p> <ul style="list-style-type: none"> - Greenhouse gas emission reductions on the network - Improved biodiversity connection across the network - Reduced material lifecycle impact - Enhanced water quality 	<p>2. Practices & impacts during construction and procurement processes - examples:</p> <ul style="list-style-type: none"> - minimised waste material creation - fuel and energy reduction - minimised storm water impacts
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Environmental & Sustainability practice is not to be considered as an externality or as just good practice; it must be considered throughout the full project lifecycle and must be included in the definitions of:

- Value for money, which is underpinned by the common concept that economic, social and environmental costs and benefits inform the procurement whole-of-life value assessment;
- Whole-of-life costs (including maintenance and operations);
- Quality; and
- AT’s key results areas as noted below.

As the asset owners over the life of publicly owned transport infrastructure, it is important that Auckland Transport gets things right from the beginning in its projects and ensures that each project follows best practice.



An example of water sensitive design to treatment of stormwater in a street.

2.7.3 Key Results Areas

The areas in Table 2 are not intended to replace the regulatory requirements for resource consents, but are intended for consideration to set suitable performance standards for Auckland Transport projects.

Table 1: Key Results Areas

Key Results Areas	Example sub-areas:
Energy & Carbon	<ul style="list-style-type: none"> - The project minimises emissions to the network through its end usage - The project considers and/or generates multi-modal opportunities - Opportunities for energy & carbon reduction for operation and construction have been identified and explored - Renewable energy options have been investigated
Water	<ul style="list-style-type: none"> - Water use reduction and water saving opportunities have been identified and incorporated (including for maintenance) - Potential non-potable water sources that match demand are identified and explored.
Materials	<ul style="list-style-type: none"> - Measures to understand and reduce material lifecycle impact are undertaken, including incorporation of recycled materials.
Discharge to Air, Land & Water	<ul style="list-style-type: none"> - Receiving water quality: Opportunities to improve local receiving water quality and/or provide environmental flows have been identified and implemented - Measures to prevent light spill during construction and operation have been identified and implemented.
Land	<ul style="list-style-type: none"> - Any land take is minimised or offset - Any topsoil and subsoil impacted is separated and protected from degradation, erosion and mixing with waste, and retains its productivity and is reused on or nearby the project or asset. - The run off, flood risk, and potential increased flood risk elsewhere as a result of the project have been assessed over the expected working life.
Waste	<ul style="list-style-type: none"> - Predictions of waste quantities and types have been developed for construction and operation, and 80%+ of material is returned for re-use/diverted from landfill. - A deconstruction plan is developed based on good practice.
Ecology	<ul style="list-style-type: none"> - For the Project site, including land used for temporary works where lands or otherwise have been deemed ecologically sensitive, a management plan has been developed minimising ecological impacts. - The project is contributing to a no-net loss or gain of biodiversity and ecological value - Habitat connectivity opportunities are identified and maintained (including offsetting) or enhanced
Community Health, Well-being & Safety	<ul style="list-style-type: none"> - Factors that contribute to community wellbeing are incorporated including those identified during stakeholder engagement. - Design and practice that reduce the likelihood of crime (CPTED). - Consideration and design for whole of life safety including end-user, maintenance and operation (IPTED).
Heritage	<ul style="list-style-type: none"> - Baseline surveys of existing heritage have been carried out including those significant to Mana Whenua, community heritage values have been incorporated, and measures to enhance values are identified and implemented.
Urban and Landscape design	<ul style="list-style-type: none"> - AT Urban design principles are applied.