RE-ENVISIONING HYBRID STREET

Exploring new terms of street typology 'Hybrid Street' which has both functions of street and transportation hub's roles with a proposed commuter rail network and other existing public transport infrastructures in Western Bay of Plenty.

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Abstract

The relationship between well-being and vibrant cities is the most important factor to create a liveable city. Most of New Zealand and worldwide other cities have been facing many issues in transportation planning which directly affect to people's wellbeing and vibrant life. Policies in New Zealand intended to create "Auto-Based Cities", because of extensive construction of highways and parking garages that facilitate and encourage faster and longer trips by car (Ooi&Yuen 108).

Urban transport planning and infrastructures often less focus on public transport system and its users, and it led to the following activities and results (Newman and Kenworthy) such as first, resulting automobile dependency leads to increased driving and increased traffic congestion, second, pedestrians are neglected and it causes a limiting cities' liveability, and finally, transport poverty and social deprivation in the suburb areas. This physical and psychological separating issue has been emphasised with increased attention to the importance of relationships between street accessibility and social inclusion.

A street designed by special conditions with heavy vehicles such as railways and large roads, creates physical and psychological barriers between communities. Individual travel behaviour is also significantly influenced by the street conditions, as a result, the value of effective street design with its social and psychological influences requires a deep understanding of its complexity.

Nowadays, street design guidelines in many other worldwide cities are focusing on the importance of activeness and liveliness in how we experience streets while still maintaining the conventional street functions with transport accessibility and connectivity. However, there are no specific researches that articulate the design strategy to identify 'Hybrid Street' which has both functions of street roles and accessible open spaces to encourage public transports which connecting the rich native sub-regional and regional cultures between neighbourhood, city, and region.

Tauranga is a high growth urban area and, given its rapid growth, developing a new public transport system has been emphasised to improve the traffic issues in Tauranga's long-term planning through the SmartGrowth Strategy. Unfortunately, despite of a high growth rate, the number of trips on public transport per person per year in Tauranga is continuing to trend downwards. (Statistics New Zealand 2019).

The viability of a passenger rail service linking Tauranga, Auckland and Hamilton in a network dubbed the "golden triangle" is being investigated by the Bay of Plenty Regional Council and the current situation of Western Bay of Plenty rail network has capacity for further services and given the connection is in place. It also could be technically feasible to run a passenger service on these lines (Joyce 2019). The research, 'Hybrid Street Design' supports government's long-term plan 'an integrated transport planning with new commuter rail network in Western Bay of Plenty.

Research paper explores a 'Hybrid Street' which has both functions of street and transportation hub's roles with the connections of existing railway network and other public transport infrastructures in Western Bay of Plenty.

Design framework advocates a pedestrian and transit-friendly streetscape connecting the rail lines to encourage street activities on the urban and sub-urban fabric, and also supports other types of sustainable transport modes. A hybrid term of street typology articulates a vision and strategic approach with design criteria to advance key objectives.

The research objective has been investigated from a research question of 'How to avoid the mono-functional logics of street with its public transport connections and how to translate it to a hybrid space that supports a variety of different types of sustainable transport modes to improve the accessibility between the neighbourhoods, cities, sub-regions and region.

The design objective will be achieved through a systematic research methodology with an idea of 'mono-functioned street networks connecting with vast overland rail routes in West Bay of Plenty is a positive opportunity to test the research ideas.

The investigated hybrid street typology will be applied and tested on nine different streets in Tauranga city business district areas (CBD) where have significantly different spatial characteristics to see how it advances key objectives and achieves the research visions through the design developing stage.

Motivation/ Issues

As a local resident in Western Bay of Plenty, I always felt that a lack of connectivity in the regional public transport systems between Tauranga Central area and other sub-urbs.

In general, Western Bay of Plenty's street accessibility to public transport is not enough to serve the entire community in the old settled neighbourhoods and recent developed areas.

Tauranga Central area is not suitable to build a new transport infrastructure but has many opportunities in land-uses with public transport systems because of a higher street connection.

Developing a new public transport system has been emphasised to improve the traffic issues in Tauranga's long-term planning through the SmartGrowth Strategy. The current Western Bay of Plenty rail network has capacity for further services and given the connection is in place it could be technically feasible to run a passenger service on these lines (Joyce 2019).

Then, I established my thesis statement from the re-search question of 'How can we shift away from traditional street designs in a way that allows for new forms ('Hybrid Streets') of streets which offer a variety of different transport modes and public activities on the top of the basic street functions with a proposed commuter rail infrastructure in Western Bay of Plenty?

I believe that 'Hybrid Functioned Street Design Study' suggests a solution to improve current issues and will indicate a good strategy for supporting a government's long-term plan 'integrated transport planning with new commuter rail network in Western Bay of Plenty'. Moreover, the provision of 'Hybrid Street' is an important healthy social promotion to encourage physical activity and to improve social participations on the street in vibrant cities.

1. Introduction & Context

Finding a new way of street typology and developing a design toolkit for 'Hybrid Street' will enhance our community connection between neighbourhood, city, and region by the vibrant streets and it will promote people's life more liveable.

1.1 Introduction

Nowadays, street design guidelines in many other worldwide cities are focusing on the importance of activeness and liveliness in how we experience streets while still maintaining the conventional street functions with transport accessibility and connectivity. However, there are no specific researches that articulate the design typology to identify 'Hybrid Street' which has both functions of street roles and public transport park connecting the rich native culture between neighbourhood, city, and region by different types of public transport modes.

1.2 Background

Western Bay of Plenty

Figure 1. National Context
50.4 % of New Zealand's population lives in 'Golden Triangle' of Auckland, Hamilton and Tauranga.

An average annual population growth is 1.4% over the last 10 years and over 50% of all filled jobs in New Zealand are occupied in 'Golden Triangle'. However, the economic and commuting linkages between three cities have significantly low level of travelling rate.

Figure 2. Western Bay of Plenty
Wider National Land Transport Network

Western Bay of Plenty

The western Bay of Plenty plays a key role in the upper North Island to connect the wider national land transport network. Important inter regional connections move significant volumes of people and goods from Tauranga to Auckland, Waikato and Taupo with state highways and freight train. The Western Bay is home to the country's largest export port, and the sub-region's productive rural and horticultural land resource is a major contributor to the economy.

Western Bay of Plenty is a high growth urban area and a polycentric land-use pattern with the geography of the sub-regional areas, negatively impacts on the transport and efficient connection between people, locations of employment, recreational spaces and education.

Given its rapid growth incorporated with the physical constraints by dispersed land use pattern, developing a new public transport system has been emphasised in Western Bay of Plenty's long-term planning through the SmartGrowth Strategy to improve the current traffic issues and to achieve the people's demands to create a vibrant connection between rural communities and urban central business district.

Figure 3. Western Bay of Plenty population

The western Bay of Plenty sub-region has grown significantly over the last 80 years.

In 1963, Tauranga had a population of just 21,500 people but today the western Bay of Plenty’s population is around 190,000 and the SmartGrowth Strategy projecting a doubling of population 275,000 by 2051.

Growth over a relatively short time-frame has put increased pressure on the sub-region’s infrastructure and services to support people’s desired outcomes and public transport user demands.

Figure 4. Bay of Plenty’s economic contribution

The Bay of Plenty region is home to the Port of Tauranga, New Zealand’s largest export port, which handles 30% of the country’s imports and exports. The Port is a key connection between the upper North Island, central New Zealand and international markets with significant volumes of product by ship, freight rail and road. The Bay of Plenty section of the East Coast Main Trunk line (ECMT) carries over a third of New Zealand’s rail traffic and is the most densely utilised section of the national rail network. The Bay of Plenty region contributed \$15.8 billion to the economy in 2018, equating to 5.6% of national GDP. Export volumes loaded at the Port of Tauranga increased 6.2% in the last year from 14,712,495 tonnes in 2017/2018 to 15,624,749 in 2018/2019.

Figure 5. Projected demographic Change

As a significant population growth, Western Bay of Plenty’s demographics are also changed rapidly. Statistics New Zealand estimates that a higher proportion of Western Bay of Plenty region’s population over the age of 40+ will attain 68% increase in 2048 from 55% in 2018.

Demographic change increases the demands for affordable housing with effective and diverse connections by public transport, walking and cycling infrastructure from Bay of Plenty sub-regional areas to City Centre.

6. Nexus (2019); Draft Tauranga Transport Programme, “Travel demand management in Tauranga survey”.
7. Arataki - Waka Kotahi (2020). REGIONAL SUMMARY BAY OF PLENTY REGION. <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/regional-summary-bay-of-plenty-august-2020.pdf>
8. 2013 Census Demographics and Deprivation Data - Bay of Plenty

Figure 6. Household Travel Survey Data

Tauranga has the highest single rates of private vehicle use in the county for journey to work in four New Zealand major cities.

Due to the high motor vehicle usage and poor connectivity in public transport system, Tauranga’s carbon emissions per capita transport are higher than Wellington (Arataki).

Therefore an enhancing public transport system in Western Bay of Plenty region is one of the considerable way to achieve environmental benefits to reduce the higher emission rate in Tauranga.

Figure 7. Transport Variety in Four Main Cities

Comparing with the result in the use of private vehicles of the four main cities, public transport use in Tauranga is the lowest and walking and cycling is lower than both Wellington and Christchurch in NZ.

Public transport system within the Bay of Plenty region is underutilised and the lack of transport choice with a high dependency on private vehicles is leading to poor social and environmental outcomes in sub-regional areas.

Figure 8. Annual Bus trips in Bay of Plenty

Unfortunately, despite of a high growth rate, the number of trips on public transport per person per year in Tauranga is continuing to trend downwards.

As shown in figure 7, the use of public transport in Western Bay of Plenty, smoothly increased between 2005-2013 from below 4.2 to 11 trips per person annually. However, growth in patronage started to decline from 2014 to now. Western Bay Public Transport Blueprint said that an average bus trip takes approximately two and a half times longer to travel between the Central Business District and key sub-urban locations than car.

New transport provision in the Bay of Plenty region over the last decades has mainly focused on auto vehicle’s infrastructure.

The Proportion of all Trips with Sustainable Modes

Figure 9. The Proportion of Sustainable Modes

The proportion of all trips using more sustainable modes (walking, Cycling or public transport) was 12% per year over the 2015-18 period.

Public Transport System and Deprivation

Figure 10. Public Transport System and deprivation in Western Bay of Plenty Region

Access to community facilities and jobs is critical for the sub-regional development. NZ Index Deprivation report indicates that 42% of Tauranga's population live in the two most deprived quintiles.

Currently, most of the low density housings on the edge of the city typically places significant pressure on the transport network. The sub-regional areas do not have enough transport options, as a result, serious inequalities are occurred.

Existing communities and future residents need access to high quality physical and social infrastructure to meet and play. Various transport options is the most considerable factor to achieve existing transport issues and prepare future development.

Figure 11. Land Use Patterns

Morphological distributions and functional linkages are the most important aspect that determine 'Land Use Pattern'. Western Bay of Plenty's harbour and peninsula based geography, dispersed land use pattern created by morphological factors and new sub-regional development in Greenfield areas impact on polycentric development.

A dispersed land use development focused on converting sub-regional area on the edges of urban centre and these physical constraints on the safe and efficient flow of information, people and goods result in traffic conflicts at multiple locations and the western Bay of Plenty's transport infrastructure system is not enough to support this ongoing developments happened in Western Bay of Plenty's sub-regions.

Figure 12. Land Use Patterns in the western Bay of Plenty

Figure 13. Mono-centric Representation

Network Analysis with Traffic Conflicts

Figure illustrates people's movement travelling to Tauranga Central District from sub-regional urban developments. Particular Tauranga's geography with peninsula based narrow land development pattern, the functional linkage is quite inefficient by the transport system which has not got enough capacity to support the growing population in the western Bay of Plenty region.

One of the morphological distribution, 'the location of facilities' is also the important aspect that determines the transport movements. Most of key facilities are located in Tauranga CBD or within Sub-regional areas. However, there are a lack of public transport choices to access the locations other than a private vehicle.

Figure 14. Network Analysis with Traffic Conflicts

Transport systems, particularly street connections from/to arterial roads or motorways, often lead to poor safety outcomes. Unsustainable reliance on private vehicles negatively impacts on traffic conflicts and sustainable issues.

A good transport system has a variety to increase interactive connections between different types of users, transport modes and street typologies to the multiple housing, educational, employment, and community hubs across the sub-region to/from the city.

Aligned Growth and Transport Infrastructure Development in Bay of Plenty Region

Figure 15. Aligned growth and transport infrastructure development in Bay of Plenty Region

Western Bay of Plenty is characterised by the combination of small coastal settlements and rural towns. Tauranga City has contributed to the creation of the urban areas in 1940's. The city was a small town of approximately 4,000 people. Rapid growth and the increase in private vehicle ownership, Tauranga has developed around car based transport City in 1950s. In 1955, Tauranga Port officially opened and land reclamation completed in 1976. As increasing on international exporting, roading infrastructure had been developed to support efficient access to New Zealand's biggest export port in Tauranga.

In 1991, Kaimai Express started and ran to Tauranga from Auckland. Significant growth over a relatively short time frame has been made and it has put pressure on the transport network and the public services to support resident's demands until now.

Tauranga is now the fifth biggest city in New Zealand, with the fourth smallest geographical area. In 2004, first SmartGrowth Strategy launched and new urban growth projects have been designed to accommodate on the edges of the sub-regional areas in Western Bay of Plenty. Development of the plan got underway in 2009 and Omokoroa is the one where now quickly expanding to become a substantial size town and has a plan to build more houses for 9000 new residents which expected to overall population of 12,000 people in around 40 years.

However, compare to the successful implementation of SmartGrowth development, transport alignment between land use and transport is inefficient and it causes a lot of issues in the western Bay of Plenty now.

2.1 Problem Statement

The context of the western Bay of Plenty with the population and economic growth, simply establishing more transport infrastructures for the private vehicles is not a feasible and effective solution. Street condition varies from travel characteristics, supported transport modes and users' behaviours.

National Problem Statement

The national issues with investigated strategy include:

Significant population change highlights the demand for accessible and effective linkages between different type of transport modes such as public transport, walking and cycling infrastructure.

Because of lack of strategic direction and design guidance on network development, traditional and existing streets were sometimes only designed to increase the connectivity between place to place; car-oriented design. This provides resulting in conflicts between active users and street’s liveability.

Problem Statement in Western Bay of Plenty Region

The issue focuses on transport networks and street utility to access various activities between different type of users in Western Bay of Plenty region.

Tauranga's geography with peninsula based narrow land development pattern, the functional linkage is quite inefficient by the transport system which has not got enough capacity to support the growing population in the western Bay of Plenty region.

Mono-centric representation of key facility's locations with ineffectively connected networks are not aligned with community demands to access community facilities in sub-regional areas.

Transport systems, particularly street connections from/to arterial roads or motorways, often lead to poor safety outcomes.

Unsustainable reliance on private vehicles negatively impacts on traffic conflicts and sustainable issues.

A low level of street utility and limited street uses caused by disconnected or not supported public transport modes.

Socioeconomic inequalities related with quality of street accessibility by public transport.

Journey times are long and the location of stops are not enough to connect between different types of transport modes in Western Bay of Plenty PT service.

Most of streets were not designed to support multi-modal transport choices and better access for people of all ages and levels of physical mobility.

2.2 Research Opportunities

The street is primarily public places where the city's economic, cultural and social activity are occurred. Street capacity and design layouts determine street's function and its important access corridors which encourage people to use public transport and other sustainable transport modes.

Figure 16. Research Opportunities

Research Opportunities

Existing street design guidelines in many other worldwide cities are focusing on the importance of activeness and liveliness in how we experience streets while still maintaining the conventional street functions with transport accessibility and connectivity. However, there are no specific researches that articulate the design strategy to identify a hybrid street typology which has both functions of transport park's and street roles connecting the rich native culture between neighbourhood, city, and region.

Design Opportunities

A LINEAR STREET TRANSPORT PARK

A high accessible transport interchange street operates transport variety to encourage the sustainable uses such as cycling, walking, skate boarding and e-scooter to all types of different aged users.

DESIGN FOR ACCESSIBILITY AND SUSTAINABILITY

from all types of users such as cycling, walking, skate boarding and e-scooter. As a result, a high accessible transport interchange space will operate transport variety to encourage the sustainable uses.

DESIGN FOR CONNECTIVITY

with active public transport and surrounded facilities to support an integrated transport planning from sub-regional trip to central area.

DESIGN FOR ACTIVE AND SAFE STREET

that people can participate and enjoy the street activities to spend their time and communicate each others, as a result, the street is more liveable.

DESIGN FOR EQUITY

‘Equity street’ supports multi-modal transport modes to everyone. The street allows to access many economic and social opportunities as Western Bay of Plenty’s population grows.

2.3 Purpose

Research paper is intended to develop a new street typology which has a hybrid of street functions and transportation park's activities with the existing railway network in Western Bay of Plenty.

Existing street design guidelines in many other worldwide cities are focusing on the importance of activeness and liveliness in how we experience streets while still maintaining the conventional street functions with transport accessibility and connectivity. However, there are no specific researches that articulate the design strategy to identify a hybrid street typology which has both functions of transport park's and street roles connecting the rich native culture between neighbourhood, city, and region.

Developing a new way or toolkit to enhance our community connection between neighbourhood, city, and region by the vibrant streets will promote people's life more liveable.

Figure 17. Research Purpose

2.4 Research Objectives

The research paper 'Hybrid Street' has five main objectives. First equity streets, second sustainable streets, third safe, accessible and active streets, fourth effective streets, fifth culturally protected streets.

The research for the 'Hybrid Street' has five main objectives:

'Hybrid Street'

1. 'Equity Hybrid Street' operates multi-modal transport modes to everyone. The street allows to access many economic and social opportunities to all types of people by effectively connected streets.
2. Supports various users such as cycling, walking, skate boarding and e-scooter. As a result, a high accessible 'transport interchange street' will operate transport variety to encourage the sustainable uses.
3. Shapes a safe and vibrant street to encourage public transport. People can participate and enjoy the street activities to spend their time and communicate each others, as a result, the street is more liveable.
4. Creates measurable outcomes in transport congestion, auto-vehicle dependency, CO2 emissions, travel inequity and street safety issues.
5. Strengthen neighbourhood and community interaction to the street, therefore each street has their own function and community identity.

2.5 Research Question

Paper's topic has been settled with a starting point of two part of research questions, first question focuses on transport and urban planning and second one for landscape architectural design terms. Those interconnected research questions are a valuable starting point to define new term of 'Hybrid Street'.

Figure 18. Research Question

2.6 Project Investigation/ Methodology

To achieve the research question, existing studies and reviews of street typology need to be dealt with to understand the basic roles of transit street's characteristics in 'Literature Review'. Through a 'Design Criteria' stage, an articulate 'Hybrid Street Typology' will be defined to be ready to use in 'Design Stage'. At the design stage, a comprehensive hybrid street typology will be used as an associated reference or a design toolkit to test the research ideas on nine different areas and two station's sites in Tauranga and finally see, how it supports the design question of 'How the hybrid street design will change people's travel behaviours by supporting the increased uses of the variety modes of transports and at the same time, how it protects a sense of place and community identity?'

Investigation Approach: Structure of Research Framework

Figure 19. Research Investigation and Methodology

03.Anchor Projects

The research ‘Re-envisioning Hybrid Street’ will develop multi-functioned street’s design outcomes with a government’s longer term of transport planning. Connection between the research and current government’s planning, significant strategies, and policy works will be undertaken in the research to looking at future transport scenarios and options including the future commuter train. The existing documents can be used to guide discussions concerning transport infrastructure especially rail in the Bay of Plenty region.

RESEARCHES: REGIONAL RAPID RAIL

Greater Auckland

Inter-Regional Rail Connection

Regional Rapid Rail is a proposal to activate an upper north island's passenger rail network connecting the "Golden Triangle" of Auckland, Waikato and Bay of Plenty. Three cities are expected to account for over 70% of New Zealand's growth in the future, however, the necessary transport infrastructure is not enough to support this rapid growth happening in three regions.

Regional Rapid Rail proposal has a three-stage processes to achieve feasibility. First is an interim-stage to be set up quickly and inexpensively using existing trains running on the current network. Second one represents an investment in new higher speed rapid trains. Third step is an expansion to increase the stations, journey frequency and reducing travel time.

The proposal of the revitalised network will provide fast and reliable travel options to regular commuters, business travellers, shoppers, students, local visitors and international tourists alike to extend the benefits of New Zealand growth and economy.

Figure 20. Regional Rapid Rail Proposal By Grater Auckland

The first stage is an interim, to be set up quickly and inexpensively using existing trains running on the current network. It is intended to build patronage and show the viability of regional intercity rail in the short term while subsequent stages are being procured.

The second stage represents an investment in new higher speed tilting trains and network upgrades to create a truly regional network of rapid trains.

The third stage expands this network, extending the lines across the Waikato and Bay of Plenty, and further improving train speeds and journey times.

RESEARCHES: Bay of Plenty metro passenger service opportunities

KiwiRail

Bay of Plenty metro passenger service opportunities Report had been developed in order to advance a vision for activated commuter rail in the Bay of Plenty region. This strategy is intended to focus on rail infrastructure to understand how to move forward in the new rail environment.

There are a number of opportunities for commuter rail in the western Bay of Plenty in long term planning. The vision of commuter rail is to explore the use of rail for passenger transport to connect new developed settlements to urban district areas. Inter-regional rail corridors between Auckland, Hamilton and Tauranga are another important opportunity to achieve national values of vibrant economic outcomes in New Zealand.

The report will be used only for the extract contains of the Bay of Plenty commuter rail network and its feasibility.

- The identified potential rail journeys are:
- 1. Omokoroa - Otumotai - Tauranga CBD
 - 2. Mt Maunganui to Tauranga CBD
 - 3. Paengaroa - TePuke - Baypark - Tauranga CBD

2.1.3 Passenger Rail

- Passenger rail services were previously operated between Tauranga, Hamilton and Auckland, however ceased operation in 2001 due to low patronage numbers and increasing costs.
- KiwiRail have confirmed that there is sufficient capacity within the Bay of Plenty rail network. This capacity could accommodate future passenger rail services. However, it is important to note, that the establishment of any passenger rail services will require significant advanced planning and investment.
- Passenger rail requires high populations and high population densities to be viable in economic or financial terms. In terms of population size and density Tauranga, as the region's largest city, is currently well below these thresholds.

References from the report

Figure 21. Distance and Time Comparison from Omokoroa to Tauranga CBD

RESEARCHES: Future Development Strategy
SmartGrowth

As population is significantly growing, there is a tension between the current settlement pattern, new greenfield growth areas and a compact city in the western Bay of Plenty. Transport infrastructure is particularly challenging as it is expensive to implement and there is also a highly dynamic two-way relationship between the way the sub-region grows and the transport system that supports it.

This proposed strategy outlines how we will work to ensure we provide sufficient development capacity for new homes and businesses to meet the needs of our communities and how can we develop a desired long-term outcome of a compact city that provides more sustainable environmental outcomes and affordable transport.

The development strategy will be used in design stage for project references to understand the Omokoroa (appendix 1) and Tauranga City’s new settlement patterns (appendix 2) and future planed transport infrastructure (appendix 3).

Figure 22. Future Development Strategy By SmartGrowth

RESEARCHES: The Urban Form and Transport Initiative (UFTI)

SmartGrowth and NZ Transport Agency

The urban form and transport initiative (UFTI) Report suggests a strategic and integrated plan for the western Bay of Plenty's future urban form and multi-modal transport system. The Report defines many transport infrastructure programmes to test the idea that 'How we can create the most effective way to provide vibrant and connected urban form between the sub-regional areas and urban centres'.

Four Programmes were shortlisted: 1. Dispersed growth 2. Two Urban centres 3. Connected Urban Villages 4. Rail-Enabled Growth.

Each programmes has been deigned to consider different land use patterns, densities expected, and transport system response.

Option 4, 'Rail-Enabled Growth' programme will be used in overall site analysis stage as an expert proofed reference to manipulate a new public transport infrastructure's possibility and the commuter rail feasibility.

Figure 23. The Urban Form and Transport Initiative (UFTI) By NZ Transport Agency and SmartGrowth

Table 1
Summary of macro transport modelling — high level and indicative key outputs

Programme	Increase of people from 2048 scenario to short list scenario	Increase in VKT from 2048 scenario to short list scenario	Increase in CO ₂ from 2048 scenario to short list scenario	Transport crash costs from 2048 scenario to short list scenario	Jobs accessible in 45 minutes by public transport from 2048 scenario to short list scenario	AM Peak PT + cycle mode share from 2048 scenario to short list scenario
Connected Urban Villages	50%	33%	22%	\$243m	50%	19%
Rail-Enabled Growth		35%	23%	\$246m	51%	17%
Two Urban Centres		38%	26%	\$259m	38%	15%
Dispersed Growth		36%	24%	\$252m	34%	15%

References from the report

Option 4. The Rail-enabled Growth

- The programme includes using the rail network to move people from the Northern and Eastern Corridors into the CBD.
- A frequent bus-based public transport system would support the rail movements along with a ferry service between Mount Maunganui and the CBD.
- Additional growth is enabled in the north and east along with intensification predominantly in Te Papa and Otumoetai areas and at other key areas such as Bayfair/Baypark and Papamoa.
- Increased dwelling densities around core transport-based hubs would be implemented to further encourage public transport movements.

04. Literature Review

Figure 24. Literature Review

Urban Renaissance

People Making Place

By Robert Powell

The urban renaissance is the mid-20th century of city regeneration movements to build spatial contributions that support and help communities to become an equally central part of the process. The most important aspects in the design concept of the urban renaissance are how the urban design can encourage and enable the cities, towns and districts within the region to work together.

Streets and public places are a central part of the urban renaissance's invention to achieve a higher quality of the 'public domain' in urban environments. They believe, the social network between different types of people and communities is determined by the quality of the streets and public spaces. In order to create well-designed valuable streets, the designer has to understand and interact with various street users which involved in or affected by the design of the public realm both in the physical; streets, parks, buildings, squares and the invisible; emotion, memory, aspiration, pride, power (00). These urban design movements in the street design have provided visions for the future of both town centre and neighbourhoods, embracing all types of people both young and old, encouraging the regeneration of the places into exciting and vibrant places.

New urbanism

Great Streets
By Allan B Jacobs

New Urbanism is an American urban design strategy that came out in the early 1980s. The strategies has influenced in many American urban-planning projects focusing on two different aspects, establishing a sustainable community and developing ecological practices. The urban movement, New Urbanism provides and promotes the environment-friendly walkable networks to access a wide range of liveable built environments. The urban movement also covers issues such as historic preservation, safe street, green building and the redevelopment of brownfield land. They believe that development and planning policies focusing on single-use zoning and heavy automobile usage create poor living environments for people.

Jane Jacobs is a representative activist which transformed the field of urban planning in many American cities. She argued that with a few exceptions, 'urban renewal' did not respect the needs of city-dwellers. Then Jacobs suggested a new method of urban design to replace modernism. She said that a continuous street system with small blocks and sidewalks to support a variety of different land uses by well-connected sustainable transports or foot. She also outlines 'comparative analysis' which is a multi-dimensional spatial investigation in not just only site itself but also experiential consequences. For example, "The impact of street trees on human's physical comfort and experience by physical phenomena of light patterns, colour, shadow, leaf movement, spatial rhythm, shade and light penetration, generates visual stimulation and spatial complexity of the street."

The basic principles of New Urbanism are that the built environment should include:

1. Liveable streets arranged in compact walkable connections.
2. A variety of housing choices to support people of diverse ages and income levels.
3. Important facilities such as schools, stores and other nearby destinations have to be reachable by walking, bicycling and public transport service.
4. Human focused spatial design
5. The street design proposal, 'New Urbanism' provides a considerable data about the physical components of streets and valuable understanding of how the street components work together to create coherent public spaces.
6. "The physical and designable characteristics of streets"
: Investigation of street frontage and the use of sectional diagrams to classify street's characteristics.

The Urban Section: An Analytical Tool for Cities and Streets By Robert Mantho. 2014

New urbanism

Human transit how clearer thinking about public transit can enrich our communities and our lives

By Jarrett Walker

The physical urban design of cities is the most important aspect to determine satisfactory transit outcomes by the users. The quality of transit is identified by three physical design aspects that are the locations of transit stops (connectivity) and its facilities, patterns of urban development and existing street typologies or types. But, most of existing street has mono-function of street characteristic that means the street does not support the integrated transport system.

Facilities of the public transit are often treated as a separate infrastructure that cannot be integrated into the mixed-use urban street. However, most of successful worldwide city's streets support the integrated transport system to serve the various kinds of public transit into the development. Public transit can enrich our communities and our lives. For that reason, the street needs to be more carefully investigated.

To sum up, many great urban design ideas can follow from accepting the needs of connecting transit services into the structure of an urban street. A multi-functioned transit friendly street is the way to offer the abundance of transit, and the crucial role of transit connections, into a positive feature of the centre's life.

BORROWED CITY

By Marco Bruno

Borrowed City shows that how private citizens use public space for their own personal benefit. People spend a considerable amount of their lives in spaces that belong to entire community such as streets, parks, squares, rivers and oceans. Public spaces have many functions and people use them to perform differently.

The author of the book emphasises that depending on how much time we spend on the area and how intensively we use it, a complex interaction between the space and user will be initiated. Through the interacting process, people negotiate with the rest of the community to maximise their personal benefit in the use of public space. Roles of the public spaces and streets are established by different actors such as local government, residents, building owners and passersby within the law. However, in some cases, the negotiation has been suggested by the local community and the role occasionally has been redefined its own level of tolerance.

Borrowed City has two intention points which are 1. To encourage people to use public space in a respectful and creative way, 2. To consider borrowing a valuable resource for a more sustainable way of life. The use of public spaces in a creative way is a natural system that identifies their local characteristics. 'Owing is an illusion, borrowing is a necessity, and our cities are the right place to do it'.

The book investigates a research methodology that explains how a specific area being used differently by various types of people and try to find design opportunities in their creative occupation process.

4.2 Streets as Public Spaces: Design focused Literatures

1. Signboards
2. Parking
3. Shops
4. Home
5. Workshops
6. Street Leisure

Figure 25. STREET USES FOR PLAYING VIDEO GAMES

Methodology

Figure00 is illustrated by the use of an isometric drawing that show how this “borrowing” process takes place in Seoul. Each space borrower (street user) is able to perform the specific activity with “spatial ingredients”. The spatial ingredient is a research term of design elements composing the street or space for example, in here, 1. Signboards 2. Parking 3. Shops 4. Home 5. Workshops 6. Street Leisure. Those ingredients give us some hints to help us better understanding of their own occupation strategy adding new character and personality to public space.

The investigated phenomenon of private exploitation of the public realm can be detected or used within different fields to understand site’s characteristics.

Paths, Tracks, and Trails: Designing for pedestrians and cyclists

By Paolo Ceccon

The condition of “network” associated with sustainable mobility should be taken as “incremental palimpsest” by connecting human and environmental values and developing a complex system built on the large and small urban and regional infrastructure.

Walking and cycling paths, public transportation systems, energy and waste management, and hydraulic plants are all common elements of the reinvention of the landscape of our cities.

There is interaction and restriction between movement and space. The public space allows all possible movements and, at the same time, influences the forms of the movements.

The book called ‘Paths, Tracks, and Trails’ illustrates that the main design criteria for walking paths and also identifies the details of a typical footpath.

Table 1 Width of zones on a typical footpath

Location	Maximum pedestrian flow	Zone				Total
		Kerb	Street furniture	Through route	Frontage	
Arterial roads in pedestrian districts	80 P/min	0.01-0.15m	1.2m	2.4m	0.75m	4.36-4.5m
CBD						
Alongside parks, schools and other major pedestrian generators						
Local roads in pedestrian districts	60 P/min	0.01-0.15m	1.2m	1.8m	0.45m	3.46-3.6m
Commercial/ industrial areas outside the CBD						
Collector roads	60 P/min	0.01-0.15m	0.9m	1.8m	0.15m	2.86-3m
Local roads in residential areas	50 P/min	0.01-0.15m	0.9m	1.5m	0.15m	2.56-2.7m

Width of zones on a typical footpath

1. Walking Path Zones

Most of the pathways are formed between the edge of the driveway and the front of the buildings or the limits of the adjacent private areas. There are four distinct areas, and it is important to distinguish between their overall width and the width of the area for pedestrians (the direct path).

2. Width of Zones

The width of walking paths depends on the urban zones where they appear, the flow of people, and the importance of connected elements.

In general, the areas that require more extensive pedestrian areas are those with:

A proximity to high-speed vehicles, and/or high volumes of vehicles

Extensive crossing areas.

High pedestrian volumes, and/or high number of pedestrians who are stationed on the sidewalk.

3. Landscaping

Landscaping, which is highly varied across different climatic tones, is to create a visually attractive space and a buffer between the sidewalk and the road. The presence of plants can give drivers the sensation of being in a “restricted space,” inviting them to reduce speed, while providing shade and shelter for pedestrians from wind and sun.

Movement and access (“path”)

By Morten Gjerd

The book, ‘Movement and access (“path”)’ written by Morten Gjerd illustrates that the quality of movement and access can be controlled or anticipated by the designer’s ability.

A definition “Positive Guidance” is the design measures that show how the way people move forward, keep on in the same direction or turn aside, slow down their pace or speed up. In the book, Morten said depends on moving motive and our reaction to surroundings (created by characteristic links between features), the direction of people’s movement and speed can be determined. This specific morphological factors affects user’s progress, especially two elements are crucial, ‘**anticipatory orientation**’ and that for proceeding as ‘**inattentively**’ as possible.

4.2 Streets as Public Spaces: Design focused Literatures

Figure 26. Anticipatory orientation: Terrace/ Plateau

Anticipatory orientation

A path indicates connections that allow people to take certainty about direction, familiarity and predictability.

Anticipatory orientation is a landscape architectural design term that if there is no actual path available, the path will be created by frequent lines of movement which indicates a line that can be followed “with certainty”. In this situation, we instinctively know that the point related to “path-markers” and it helps us to “form” and predict our own movement lines.

Path makers are recognisable forms which provide reference points to help us to move forward confidently over long stretches. The path is created not only by particular points such as striking individual trees, rock formations and buildings, but also **Special Lines** in the terrain relief such as linear markers like small ridges, shorelines and little valley.

Landscape design terms of path makers are used consciously or instinctively as important aids to progress. For instance, terraces and hills are followed for preference along the bottom of a slope or the top of a terrace, or over the top of a low hill. These special lines function as linear path-markers which rarely occur within the topography.

Figure 27. Path and goal

Path and goal

An connective system is all the more successful the more interesting destinations are built in as a matter of course, and the more clearly users are supported in their instinctive urge to address a particular goal. The less intrusive a necessary deviation from the line of the path is, the more “palatable” attractive reference points are made to the user, the less shifts in the line of the path will be seen as constraints on forward movement “Positive Control”.

“Negative Control” makes people feel that they are being prevented from arriving their destination, and that they are having to avoid obstacles. This usually means that they leave the prescribed path to reach their chosen goal more directly. If this is not possible, they feel uncomfortable to use the path.

Figure 28. Path routing: visual links

Path routing and visual links

Perception field for shifted routing: access to a wide range of scenes but they have to be there to be seen.

Figure 29. Path routing: use of the area

Path Routing

High quality path is judged by its potential for creating or retaining useful spaces for people to experience. This is why paths often laid along boundaries: the mutual disturbance caused by linear movement (path) and use of area can be minimised by this, and larger areas remain coherent units. The boundary is also additionally strengthened by the path running by it.

Path routes that follow a strongly dominant direction within areas or parts of areas “automatically” offer guidance (positive control): the directional nature of the path and of the space are mutually reinforcing.

Figure 30. Path Junctions

The classic road junction has no points of repose

This enlargement does not make a good joint for the paths: capped corners are not areas of repose, but the area with the most traffic in them

Rounding off is no better, it just creates an absence of corners

Offsetting

Offset point as a stopping-place (with the basic building bricks of repose, “bench and tree”)

Protected back

Open, attractive view

Rest area

Bench on the path - possible for very wide paths

Bench havens

Usually better: stopping-place with benches (additionally marked with trees)

Figure 31. Path Junctions and a Stopping Behaviour

The seat or bench - a stopping behaviour

Landscape features such as benches and seats are essential “building bricks” for open/public space, complementing movement and offering a clear invitation to stop and rest.

There are three crucial design criteria for bench position.

1. Quiet surroundings
2. Clear view of a busy urban square, facing a striking landscape and the approaching path
3. Safe protections by a wall, hedge, tall grass, tree-trunk and terrace.

PATH POINTS

**Radially offset
intersecting paths,
benches in quiet zones**

**Equal status junction - all
directions have the same
value**

**Extending the joint,
benches with trees on
each side**

**Hierarchical junction -
“opening” the corner
makes the north-south
link “more important”**

**Expanding the joint,
calming with bench
“havens”**

**Additional marking of the
end (beginning) of the
side paths (bench, tree)**

**Expanding the joint,
unmistakable place for
sitting**

STOPPING PLACES

**1. Stopping-place as a joint
in the path - interrupting a
long run of pathway**

**2. Niche “by” the path -
neither part of the path nor
really separate. Mainly out of
the field of vision (30-35°),
long view retained. Not to be
recommended**

**3. Better: independent unit -
clearly apart from the path,
access by its own path.
Change of use such as
children's play grounds)**

**4. Stopping-place where the path swings - maintaining a link with the
direction of the paths by being at right angles to the main movement
line, stopping-place is part of the path. Better than example 2**

**5. Stopping-place at the apex
of a curve in the path -
clearly “in the field of vision”.
Functionally similar to
example 4**

4.3 Dimensions of Street Design

To achieve the research objectives, existing studies and reviews of street typology need to be dealt with to understand the basic roles of street characteristics in ‘Literature Review’ and ‘Dimensions of Street Design’.

Street Typology Studies

By NACTO (National Association of City Transportation Officials)

Street Typology Studies by NACTO identify the range of street typologies and its basic roles of street characteristics. To investigate and developing a new design concept of street typology, existing streets must be documented and analysed as part of the site investigation.

Use the guidance in this chapter to identify opportunities to develop a new design concept of street typology, 'Hybrid Street'. The samples included here are placed in sections to illustrate how different street types support a variety of street users, transport modes and characteristic conditions.

A variety of street users, transport modes and characteristic of the street conditions have diverse design requirements and landscape architecture involves this consideration.

A Variety of Street Users

- 1 Pedestrians
- 2 Cyclists
- 3 Taking Transit Users
- 4 Doing Business

A Variety of Street Users

Streets constitute the largest percentage of public property, and this space must equitably accommodate people between the needs of the many different users. To support 'Equitable Streets', design elements and criteria have to be identified to encourage the variety of people using.

In the chapter of 'A Variety of Street Users' illustrates street users for walking, cycling, taking transit, participating street activities, using city services, finding public spaces and working own business, and how the people use the streets differently recreated by different users.

1 Street Design for Pedestrians

Street Design for Pedestrians

Pedestrian-Priority Street means making streets accessible to the most vulnerable users and people of all ages, sitting, walking, pausing and resting within urban streets.

Pedestrian Street Design Toolbox

Following collections are essential street elements to design a 'Hybrid Functioned Street'. The toolbox can be used as a reference to check the design elements for all types of street design.

Pedestrian Crossing Types

Pedestrian crossing is one of the most important factors to create an active and vibrant street. Efficient street crossings encourage people to use street more frequently and safely. Pedestrian crossings sometimes shape pedestrian behaviour, for example, there is a more direct route, even if, it is unsafe and unprotected, people prefer to cross the road to use it. Therefore, placing a site to locate the pedestrian crossing requires a deep understanding about its physical layout of the street, types of users and their behaviours.

Pedestrian Refuges/ Medians

Pedestrian refuges and Medians are a pedestrian crossing that provides easier and safer pedestrian accesses to cross multiple lanes of traffic or narrower streets where speeds and vehicular volumes make unsafe crossing conditions.

Islands should be at least 1.8-2.4 m deep and 10-12 m long with providing enough protection at each end of the waiting space.

Signage and Way-finding

Signage and Way-finding is a street system that offers multi-modal information to all different types of street users. The system encourages a sustainable transport uses and walking and cycling by informing the available transit types and how those are connected each other to preferred destinations. Wayfinding recommended to install every 5-10 minute walking distances and its location has to be placed on the streets with high pedestrian volumes near transit stops, parks, public facilities and markets.

Sidewalk Extensions

Sidewalk extensions physically and visually narrow the roadway while increasing the available waiting space to cross the roads and provide areas for street furniture and benches, transit stops, trees, and landscaping. The extensions sometimes gives an opportunity to show street identities which created by local, community and neighbourhood users, and engineering systems such as stormwater management and other public space enhancements.

Sidewalk Extensions Types:

- Bulb-Outs
- Slip Lane Removal
- Corner Alignments

Kerbs: Kerbs should not be more than 15 cm high. They should incorporate ramps at pedestrian crossing to facilitate safe access.

Trees and Landscaping

- Pleasant walking environments
- Neighbourhood characters
- Active transportation choices
- Microclimatic conditions
- Clean the air and filters water
- Biodiversity of a city
- Physical and mental health benefits

Universal Accessibility

Pedestrian Ramp is a facilitating area that provides the access of sidewalks for people using personal mobility devices.

Pedestrian ramp is composed of three elements which are the slope, the top lading and the side flares and it has to be built of non-slip materials. The slope of the ramp should have a 10%-12% gradient with universal standard measured detectable surfaces.

Variations

Sidewalk Cafés

Storefront Spillovers and Stalls

Street Vendors and Kiosks

Street Design for Commercial Uses

Business is part of every city and streets should be designed to provide formal and informal on-street commercial activity. Supporting commercial activity should balance the various different users in a given environment of safe and vibrant street.

Geometry

Commercial Use Extension

Vendors on Sidewalks

Vendors in Enhancement

Siting Guidance

3 Taking Transit Users

Transit Facilities

Boarding Vehicles

0 km/h

Transit in Mixed Traffic

10 km/h

Dedicated Transit Lane

20 km/h

Dedicated Transit Way

40 km/h

50 km/h

Street Design for Transit

Public transport offers a sustainable and efficient way to move people in an urban setting. The street has to be designed to support various transit networks to maintain transit movement in a pedestrian-friendly and safe environment for all users.

‘Creating dedicated space within the street helps transit networks to provide reliable, convenient, and frequent service to passengers without delays from mixed traffic, while increasing the mobility capacity and environmental sustainability of the city.’

Stop Types

In-Lane Stops

Island Stops

Median Stops

Pull-Out Stops

Boarding Lanes and Transit Stands

Shared Stops or Easy Access Stops

Street Design for Cyclists

Street design for cyclists should allow for social and conversational riding for everyday use as well as long commutes. Cycle tracks should be designed for all type of riders and all levels of comfort.

Cycle Share Station Configurations

Configuration 1
Parking spaces adjacent to sidewalks

Configuration 2
Parking spaces adjacent to cycle lanes

Configuration 3
On wide sidewalks

Configuration 4
In adjacent public spaces, parks, or destination sites outside the public right-of-way

Cycle Facilities at Transit Stop

Cycle Track Behind Boarding Island

Cycle Track on Bus Bulb

Cycle Lane Behind Boarding Island

Protected Cycle Facilities at Intersections

Dimensions of Street Design

Evaluate different types of street typology depending on a variety of street users, supported transport modes and characteristics of street condition.

Pedestrian-Priority Spaces

- 1 Frontage Zone
- 2 Clear Path
- 3 Street Furniture Zone
- 4 Cycleway
- 5 Buffer Zone
- 6 Public Transit Corridor

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business, Children/ Parents and People with Disabilities

Supported Transport Modes: Local Bus, Inter-Regional Bus, Rapid, Transit Bus, Sustainable Transports, Taxi

Characteristic Conditions: Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Building Edges Vibrancy

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business, Children/ Parents and People with Disabilities

Supported Transport Modes: Sustainable Transports

Characteristic Conditions: Safe and Secure, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Flexible and Resilient, Cultural Preservation

Shared Streets

- ① Residential Zone
- ② Residential Share
- ③ Seating Boundaries
- ④ Loading Vehicle Zone/ Mixed Uses
- ⑤ Commercial Share
- ⑥ Commercial Zone

Avenues and Boulevards

- 1 Pedestrian and Cycle Share
- 2 Road
- 3 Large Street with Transit
- 4 Street Station
- 5 Open Space for Transit Exchanges
- 6 Protected Cycle Path
- 7 Street Buffer

A Variety of Street Users: Taking Transit Users and Private Vehicle Users

Supported Transport Modes: Auto Vehicles, Inter-city Bus, Local Bus, Inter-Regional Bus, Rapid Transit/Tram and Taxi

Characteristic Conditions: Universal, Connectivity and Legibility, Creating and connecting a Vibrant Sub-region

Neighbourhood Streets

- 1 Residential Zone
- 2 Semi-Private Frontage
- 3 Buffer Zone/Cycle Parking
- 4 Street Car Parks/Bus Lane
- 5 Cycleway
- 6 Neighbourhood Main Street
- 7 Transit Stop
- 8 Residential Path

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business, Children/ Parents and Students

Supported Transport Modes: Auto Vehicles, Inter-city Bus, Local Bus, Inter-Regional Bus, Rapid Transit Bus, Sustainable Transports and Taxi

Characteristic Conditions: Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Building Edges Vibrancy, Creating and connecting a Vibrant Sub-region

RAILWAY STATION STREET 1

Special Conditions

- 1 Drop Off Area
- 2 Pedestrian Connection
- 3 Planting Protection
- 4 Railway Stop
- 5 Double-Track Railway
- 6 Transport Hub
- 7 Bus Interchange
- 8 Crossing Bridge

A Variety of Street Users: Taking Transit Users and Private Vehicle Users

Supported Transport Modes: Rail/ Train and Auto Vehicles

Characteristic Conditions: Universal, Creating and connecting a Vibrant Sub-region, Connectivity and Legibility

RAILWAY STATION STREET 2 Special Conditions

- 1 Drop Off Area
- 2 Bus Only Lane
- 3 Underpass
- 4 One-Side Rail Track
- 5 Both-Side Station
- 6 Footpath
- 7 Park and Ride

A Variety of Street Users: Taking Transit Users and Private Vehicle Users

Supported Transport Modes: Rail/ Train and Auto Vehicles

Characteristic Conditions: Universal, Creating and connecting a Vibrant Sub-region, Connectivity and Legibility

A Variety of Street Users: Pedestrians, Cyclists, Children/ Parents and People with Disabilities

Supported Transport Modes: Rail/ Train (not accessible), Sustainable Transports and Ferry

Characteristic Conditions: Safe and Secure, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Pleasant; Creative and Inviting, Flexible and Resilient.

WATERFRONT CORRIDOR Special Conditions

- 1 Road
- 2 Footpath
- 3 Vegetation Buffer
- 4 Harbour Walkway
- 5 Embankment
- 6 Natural Barrier
- 7 Boardwalk

Playing Streets

- 1 Commercial Zone
- 2 Commercial Share
- 3 Open Street
- 4 Pedestrian Only Zone Boundary
- 5 Transport Connection
- 6 Public Transit Corridor

A Variety of Street Users: Pedestrians, Doing Business, Children/ Parents

Supported Transport Modes: Local Bus and Sustainable Transports

Characteristic Conditions: Safe and Secure, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Flexible and Resilient, Cultural Preservation

05. Design Criteria

Under design principle, 'Hybrid Streets' provides specific design criteria, which are outlined in chapter 5. The main design criteria for Hybrid Streets are Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edge Vibrancy, Pleasant; Creative and Inviting, Creating and Connecting A Vibrant Sub-Region, Flexible and Resilient, Cultural Preservation.

Safe and Secure

Universal

Connectivity and Legibility

Walking and Cycling Friendly

Accessibility; Places for Every Person

Comfort and Convenient

Green

Building Edge Vibrancy

Pleasant; Creative and Inviting

Creating and Connecting A Vibrant Sub-Region

Flexible and Resilient

Cultural Preservation

Safe and Secure

Safe and Secure

Construction materials in public spaces and streets should be safe and secure to support various street users especially the most vulnerable users such as children, the elderly, and disabled and modes of pedestrians and cyclists. Key contributors to safety are appropriate geometric design, facility design and transport operations with protection from high-speed traffic and appropriate lighting.

Appropriate speed limit for the safe and secure street is 30 km/h at schools, town centres, bus services and neighbourhoods street.

Universal

Universal

The routes must be equipped with devices to ensure access for people with limited mobility through gentle slopes, visual contrasts, sounds and specific tactile characteristics.

Connectivity and Legibility

Connectivity and Legibility

To provide a feasible and attractive alternative to other modes of transport, pedestrian connections need to offer clear, continuous, direct paths and maximised route choice.

When the various modes of transport work together in interconnected networks, access to many destinations is provided.

Street networks should minimise block sizes and maximise pedestrian connections. The attractiveness of walking versus other modes of transport increases over short trips and where quality pedestrian connections are provided, particularly where a more direct path is provided for people on foot than for other modes.

Walking and Cycling Friendly

Walking and Cycling Friendly

Our most valued urban places are those principally designed for the use and enjoyment of people on foot. This requires a closely spaced network of streets and blocks that offer direct, safe, varied pedestrian routes made interesting through careful design.

Provide cycle-share systems and shared micromobility options, improve or add new transit services, revise transit schedules, invite electric vehicle share systems, and offer electric vehicle charging stations. These offer families more choices for traveling to their destinations.

Accessibility; Places for Every Person

Accessibility; Places for Every Person

Accessible Streets aims to support a shift from private vehicles to more energy efficient, low-cost and healthier modes of transport like walking, cycling and public transport. Everyone who uses the transport network will be affected by these proposed changes.

Comfort and Convenient

Comfort and Convenient

Streets should be designed according to the scale of the human body and to function according to the senses. Scale is determined by spatial design and detailing, including building massing, street furniture design and wayfinding. Streetscapes should be comfortable rather than intimidating

Green

Green

Street trees and low planting provide amenity to city streets. Street trees visually define the continuous path, slow traffic down, form a barrier between vulnerable users and moving vehicles, and provide shade. All vegetation provides oxygen, filters air pollution, reduces rain run-off, cools the air and visually softens the public realm. Street vegetation should be considered as an integral part of the design of pedestrian connections. Vegetation can be accommodated in berms, in kerb build-outs between carparks or in raised planters.

Building Edge Vibrancy

Building Edge Vibrancy

Street design should encourage and enable recreation, social interaction and business activity. Designs should maximise the road reserve space that will be used for social, economic and environmental purposes. Streets should be designed to create an attractive, comfortable, pedestrian-scale environment with a range of amenities, including street trees and other vegetation. Streets serve as the key platform for economic exchange in cities. Improved accessibility and a more welcoming street environment attract more people and more activity, thus strengthening communities, the businesses that serve them and the overall city economy.

Pleasant; Creative and Inviting

Pleasant; Creative and Inviting

Consistency of quality is important - the network is only as good as its weakest link and people will avoid routes where footpaths are uneven, obstructed or end abruptly, even if the interruption is for a short stretch. Route choice allows flexibility for different users, for example where some streets are steep, other continuous, low-gradient routes can provide an alternative.

Creating and Connecting A Vibrant Sub-Region

Creating and Connecting A Vibrant Sub-Region

A collection of streets form and define the structure of neighbourhoods and places. They set and influence the long-term patterns of development. They connect people to each other and to destinations. Street networks are not just about transport and infrastructure, but also about the movement of people, goods, ideas, and wealth. They foster economic activity and provide public space for human interaction.

Flexible and Resilient

Flexible and Resilient

Many streets today reflect the priorities and practices from the time they were first built. The street designs should reflect these new conditions and priorities. Streets can change through major interventions and capital improvement projects, and they can also change systematically through road renewals and ongoing maintenance. Street designs can also be strategically implemented through quick, low-cost interventions that can serve as interim stages to more long-term visions.

Cultural Preservation

Cultural Preservation

Te Aranga Māori Design Principles are founded on intrinsic Māori cultural values. They have arisen from a widely held desire by Māori to enhance their presence, visibility and participation in the design of the physical realm.

Pedestrian-Priority Spaces

Shared Streets

Neighbourhood Streets

Avenues and Boulevards

Streets with Special Conditions 1

Streets with Special Conditions 2

Streets with Special Conditions 3

Playing Streets

06. Design Toolkits for ‘Hybrid Street’

This section provides the design toolkits of ‘5 Hybrid Street’. The five hybrid street typologies take into account the scale, density, diversity of destinations, quality of place as well as the significance of movement by different modes. The investigated hybrid street typology will be applied and tested through the design developing stage.

Design Toolkits for ‘Hybrid Street’

<p>Hybrid Street Typology 1: Street Focused on Sustainable Transport Modes</p> <p>Safe and Secure</p> <p>Universal</p> <p>Connectivity and Legibility</p> <p>Walking and Cycling Friendly</p> <p>Accessibility; Places for Every Person</p> <p>Comfort and Convenient</p> <p>Green</p> <p>Building Edges Vibrancy</p> <p>Pleasant; Creative and Inviting</p> <p>Creating and connecting a Vibrant Sub-region</p> <p>Flexible and Resilient</p> <p>Pedestrian-Priority Spaces Streets with Special Conditions 2 Streets with Special Conditions 3</p>	<p>Hybrid Street Typology 2: Active Street</p> <p>Safe and Secure</p> <p>Universal</p> <p>Connectivity and Legibility</p> <p>Walking and Cycling Friendly</p> <p>Accessibility; Places for Every Person</p> <p>Comfort and Convenient</p> <p>Green</p> <p>Building Edges Vibrancy</p> <p>Pleasant; Creative and Inviting</p> <p>Creating and connecting a Vibrant Sub-region</p> <p>Flexible and Resilient</p> <p>Cultural Preservation</p> <p>Shared Streets Neighbourhood Streets</p>	<p>Hybrid Street Typology 3: Linear Park Street</p> <p>Safe and Secure</p> <p>Walking and Cycling Friendly</p> <p>Accessibility; Places for Every Person</p> <p>Comfort and Convenient</p> <p>Green</p> <p>Building Edges Vibrancy</p> <p>Pleasant; Creative and Inviting</p> <p>Flexible and Resilient</p> <p>Cultural Preservation</p> <p>Streets with Special Conditions 3 Playing Streets</p>	<p>Hybrid Street Typology 4: Commercial Street</p> <p>Safe and Secure</p> <p>Universal</p> <p>Connectivity and Legibility</p> <p>Walking and Cycling Friendly</p> <p>Accessibility; Places for Every Person</p> <p>Comfort and Convenient</p> <p>Green</p> <p>Building Edges Vibrancy</p> <p>Pleasant; Creative and Inviting</p> <p>Creating and connecting a Vibrant Sub-region</p> <p>Flexible and Resilient</p> <p>Cultural Preservation</p> <p>Shared Streets Avenues and Boulevards</p>	<p>Hybrid Street Typology 5: Transport Interchange Street</p> <p>Universal</p> <p>Connectivity and Legibility</p> <p>Accessibility; Places for Every Person</p> <p>Creating and connecting a Vibrant Sub-region</p> <p>Avenues and Boulevards Streets with Special Conditions 1 Streets with Special Conditions 2</p>
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Hybrid Street Typology 1: Street Focused on Sustainable Transport Modes

- 1 Pedestrian Path
- 2 Green Space
- 3 Kerbline and Safety Fence
- 4 Coloured Bike Lane
- 5 Barrier Treatments/ Buffers, and Signage
- 6 Railway Corridor
- 7 Railway Platform
- 8 Entrance Point
- 9 Kerbline and Safety Fence
- 10 Open Space
- 11 Pathway
- 12 Coloured Bike Lane
- 13 Road
- 14 Bus Stop
- 15 Flush Pedestrian Crossing

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business, Children/ Parents, People with Disabilities and Private Vehicle Users

Supported Transport Modes: Auto Vehicles, Local Bus, Inter-Regional Bus, Rapid, Tram Sustainable Transports, Taxi

Characteristic Conditions: Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Creating and connecting a Vibrant Sub-region, Flexible and Resilient

Street Focused on Sustainable Transport Modes

Provide accessible spaces for sustainable transport uses which include walking and cycling, rapid rail and local bus.

Hybrid Street Typology 2: Active Street

- ① Pedestrian Path
- ② Low Speed Shared Street
- ③ Pedestrian Path
- ④ Street Furnitures
- ⑤ Kerbline
- ⑥ Entrance Point
- ⑦ Fence
- ⑧ Green Space
- ⑨ Flush Pedestrian Crossing
- ⑩ Building Frontage
- ⑪ Different Type of Road Connection

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business, Children/ Parents, People with Disabilities and Students

Supported Transport Modes: Auto Vehicles, Inter-city Bus, Local Bus, Inter-Regional Bus, Rapid Transit Bus, Sustainable Transports and Taxi

Characteristic Conditions: Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Creating and connecting a Vibrant Sub-region, Flexible and Resilient, Cultural Preservation

Active Street

Low speed shared street which offers active spaces for urban activities such as shopping, outdoor dining and play-along-the-way.

Hybrid Street Typology 3: Linear Park Street

- ① Wall Seating
- ② Green Space
- ③ Kerbline
- ④ Pedestrian Only Street

- ⑤ Street Furnitures
- ⑥ Eating Place
- ⑦ Building Entrance Point
- ⑧ Green Buffer

A Variety of Street Users: Pedestrians, Cyclists, Doing Business, Children/ Parents and People with Disabilities

Supported Transport Modes: Sustainable Transports

Characteristic Conditions: Safe and Secure, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Flexible and Resilient, Cultural Preservation

Linear Park Street

Provide a pedestrian-only connection which creates an safe and accessible street plaza to offer urban activities such as walking and cycling, play-along-the-way, picnic and rest.

Hybrid Street Typology 4: Commercial Street

① Green Space	⑧ Low Speed Zone
② Open Plaza	⑨ City Living
③ Bus Stop	⑩ Commercial Zone
④ Transit Priority Street	⑪ Commercial Street
⑤ Pedestrian Path	⑫ Vegetation
⑥ Different Type of Road Connection	⑬ Building Frontage
⑦ Flush Pedestrian Crossing	

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, Doing Business and People with Disabilities and Private Vehicle Users

Supported Transport Modes: Auto Vehicles, Inter-city Bus, Local Bus, Inter-Regional Bus, Sustainable Transports and Taxi

Characteristic Conditions: Safe and Secure, Universal, Connectivity and Legibility, Walking and Cycling Friendly, Accessibility; Places for Every Person, Comfort and Convenient, Green, Building Edges Vibrancy, Pleasant; Creative and Inviting, Creating and connecting a Vibrant Sub-region, Flexible and Resilient, Cultural Preservation

Commercial Street

Provide commercial activities such as shopping, outdoor dining and play-along-the-way. The commercial street includes 'Food District Street' and 'City Living Street'

Hybrid Street Typology 5: Transport Interchange Street

- 1 Barrier Treatments/ Buffers, and Signage
- 2 Hills
- 3 Railway Corridor
- 4 Railway Platform
- 5 Railway Station
- 6 Barrier Treatments/ Buffers, and Signage
- 7 Entrance Points
- 8 Railway Station Frontage Space
- 9 Open Space
- 10 Bus Stop
- 11 Vegetation
- 12 Transit Priority Street
- 13 Pathway
- 14 Flush Pedestrian Crossing
- 15 Low Speed Zone

A Variety of Street Users: Pedestrians, Cyclists, Taking Transit Users, People with Disabilities and Private Vehicle Users

Supported Transport Modes: Rail/ Train, Auto Vehicles, Inter-city Bus, Local Bus, Inter-Regional Bus and Taxi

Characteristic Conditions: Universal, Connectivity and Legibility, Creating and connecting a Vibrant Sub-region

Railway Station or Transport Interchange Street

Supporting a variety of public transport modes along the transit-friendly designed street. Open spaces are required to offer safety protection boundary between railway platform, station and connected streets.

5 Hybrid Street Typologies

Hybrid Street Typology 1: Street Focused on Sustainable Transport Modes

STREET USERS

PEDESTRIANS

CYCLISTS

TAKING TRANSIT USERS

DOING BUSINESS

CHILDREN/ PARENT

PEOPLE WITH DISABILITIES

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

Hybrid Street Typology 2: Active Street

STREET USERS

PEDESTRIANS

CYCLISTS

TAKING TRANSIT USERS

DOING BUSINESS

CHILDREN/ PARENT

PEOPLE WITH DISABILITIES

STUDENTS

ACTIVITIES

MODE OF TRANSPORT

Hybrid Street Typology 3: Linear Park Street

STREET USERS

PEDESTRIANS

CYCLISTS

DOING BUSINESS

CHILDREN/ PARENT

PEOPLE WITH DISABILITIES

ACTIVITIES

MODE OF TRANSPORT

Hybrid Street Typology 4: Commercial Street

STREET USERS

PEDESTRIANS

CYCLISTS

TAKING TRANSIT USERS

DOING BUSINESS

PEOPLE WITH DISABILITIES

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

Hybrid Street Typology 5: Transport Interchange Street

STREET USERS

PEDESTRIANS

CYCLISTS

TAKING TRANSIT USERS

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

07. Case Studies

The case studies explore the concept of landscape architecture with 'Multi-functional Street Design with variety transport options' as a methodology to articulate the terms of 'Hybrid Street' on the practical worldwide sites.

Adolf Horn Avenue

Automobile Priority Avenue | Tlajomulco de Zuniga, Mexico

Typology: Median Strip Design/ Sustainable Transport Supported Avenue

Hybrid Street Type 1

Project Dates: 2011

Adolf Horn Avenue is an urban remodeling project, which recreates an abandon central space of unused avenue to the great central public space.

Adolf Horn Avenue was built to connect diverse regions within Tlajomulco de Zuniga city. Then the avenue has strong strategies to offer a good connection between non-motorised mobility and public transports. The median strip provides a 3-kilometre bicycle lane and pedestrian path giving priority to public space and green areas, over automobiles.

Adolf Horn Avenue's central trip is the greatest example that shows how the automobile priority avenue can be translated to 'Sustainable Transport Supported Street'.

Daldy Street Linear Pak

Post-Industrial Terrain Vagued Street | Auckland, New Zealand

Typology: Linear Park/ Sustainable Design

Hybrid Street Type 1

Project Dates: 2009-2013

Daldy Street Linear Park is the second of the Wynyard Quarters urban renewal project focused on integrated urban transport system between sustainable infrastructure and movement networks.

Hybrid combination of the street's functionality and linearity from the edge of Auckland city central area to harbour with rhythmical spatial episodic design elements provides diverse programs to people to re-vitalise post-industrial area.

This multi-functioned street park supports a variety of sustainable transport users such as cyclists, public transit users and trams; private vehicles are of lowest priority here. The kerbless street offers a four metre wide pedestrian connection with shaped landscape areas and rain gardens connected by small timber bridges between open space areas and streets.

MONON BOULEVARD & MIDTOWN PLAZA

Shared-Use Pathway | Carmel, Indianapolis, USA

Typology: Street Park/ Multi-Functioned Boulevard

Hybrid Street Type 2

Project Dates: 2019

Monon boulevard is an expansion and transformation of a shared-use street into a multi-modal boulevard that offers dedicated paths for pedestrians and bicycles, open spaces, plazas, and activity zones and traffic-calmed roadways.

A range of amenities have been integrated within the expanded corridor to support a rapidly growing of new mixed-use development.

The Monon boulevard is the valuable project which illustrates how a well-designed and highly programmed linear park space can provide an organising spine for innovative placemaking and multimodal connectivity beyond its simple utilitarian function.

Bell Street Park

*4-Block Sectioned Neighbourhood Street |
Seattle, WA, USA*

*Typology: Woonerf; Living Street/ Multi-Modal
Transport*

Hybrid Street Type 3

Project Dates: 2009 – 2014

Bell Street Park is a globally proven “Shared Street” where pedestrians, bikes and cars peacefully coexist without any traffic engineering or posted regulations.

The Bell street was a single-purpose right-of-way which had a design characteristic of auto-vehicle priority street. However, supported by a Dutch urban design strategy of ‘Woonerf (living street)’, the street was finally transformed into a multi-functional open corridor where supports the public right-of-way to every transportation users.

The street provides an outdoor living room to residents of Seattle’s high-density neighbourhood while allowing automobiles, public transports and bicycle.

Geometry

'The Greenway'

'The Yards'

'The Lanes'

South Frame Public Realm

7 Former Industrial City Fringe Blocks /
Christchurch, New Zealand

Typology: Pedestrian Priority/ Shared Streets

Hybrid Street Type 4

Project Dates: 2015

The South Frame Public Realm is a transformational regeneration project in 7 existing former industrial city fringe blocks in Christchurch.

This 20,000sqm of new public realm offers emerging innovative, educational and entertainment activities to support the cities renewal.

The South Frame network comprises of three key strategic design concepts which are 'The Greenway', 'The Lanes' and 'The Yards'.

The Greenway is an urban garden that identifies Christchurch's ecology, archaeology and social infrastructure into an integrated story-telling journey through the corridor.

The Lanes is a new lane-way network which provides north-south pedestrian priority connections to improve the higher accessibility from the east-west South Frame main corridor.

The Yards is a public open space or square of landscape destinations that offers social, cultural and economic activities.

- 1 Shared Street
- 2 Cycleway Separation
- 3 Pedestrian Island and Transit Stop

Max Orange Line, Portlandto Milwaukie Streets

MAX ORANGE LINE Corridor | Oregon, USA
Typology: Sustainable Corridor/ Multi-Modal Paths

Hybrid Street Type 5
Project Dates: 2015

Portland to Milwaukie Streets aligned with the 11.7 km MAX Orange Line is vital strategy for growth management and liveable communities.

Inter-related street system with light rail, streetcar, bus, pavements and multi-modal paths provides a safe and efficient access to stations for all types of different transit users.

It is a multi-modal network of vibrant, healthy, community places that help neighbourhoods maintain liveability while supporting the future growth of the region.

08. Design Opportunities

City Centre Spatial Framework Strategies

The City Centre Spatial Framework identifies twelve Key Moves to strengthen the city centre. Each street offers the potential to deliver at least six design strategies.

Design framework advocates a pedestrian and transit-friendly streetscape connecting the rail lines to encourage street activities on the urban and suburban fabric, and also supports other types of sustainable transport modes. A hybrid term of street typology articulates a vision and strategic approach with design criteria to advance key objectives.

1. Safe and Secure

2. Universal

3. Connectivity and Legibility

4. Walking and Cycling Friendly

5. Accessibility, Places for Every Person

6. Comfort and Convenient

7. Green

8. Building Edge Vibrancy

9. Pleasant; Creative and Inviting

10. Creating and Connecting A Vibrant Sub-Region

11. Flexible and Resilient

12. Cultural Preservation

Street Design In Context

Through previous stage, five different types of 'Hybrid Street' have been investigated from a research question of 'How the mono-functional street can be translated to a hybrid space that supports a variety of the sustainable transport modes to improve the accessibility between the neighbourhoods, cities, sub-regions and region.

FIVE DIFFERENT TYPES OF HYBRID STREET IDENTIFIED THROUGH THE PREVIOUS INVESTIGATION ARE...

Street Focused on Sustainable Transport Modes

Provide accessible spaces for sustainable transport uses which include walking and cycling, rapid rail and local bus.

Commercial Street

Provide commercial activities such as shopping, outdoor dining and play-along-the-way. The commercial street includes 'Food District Street' and 'City Living Street'

Active Street

Low speed shared street which offers active spaces for urban activities such as shopping, outdoor dining and play-along-the-way.

Railway Station or Transport Interchange Street

Supporting a variety of public transport modes along the transit-friendly designed street. Open spaces are required to offer safety protection boundary between railway platform, station and connected streets.

Linear Park Street

Provide a pedestrian-only connection which creates an safe and accessible street plaza to offer urban activities such as walking and cycling, play-along-the-way, picnic and rest.

Heavy Rail

Proposed Passenger Train Service

Figure 33. Proposed Passenger Train Service in Western Bay of Plenty

Imagination of the new public transport networks and possible main stations when the Tauranga commuter rail is activated.

8.1 Sites For Design

The investigated hybrid street typology will be applied and tested on 11 different sites in Tauranga city business district areas (CBD) where have significantly different spatial characteristics to see how it advances key objectives and achieves the research visions.

Site Analysis

Figure 34. Existing Transport Infrastructures

- RAIL LINE
- WALKING AND CYCLING
- BUS ROUTES
- TOUR FERRY

Figure 35. Spatial Identities

- A. WATERFRONT PRECINCT
- B. SPORT PRECINCT/ TAURANGA DOMAIN
- C. CBD
- D. EDUCATION PRECINCT
- E. RETAIL AND COMMERCIAL PRECINCT
- F. SCHOOLS
- G. MAIN CONNECTION: CAMERON RAOD
- H. HIGHWAY CONNECTION
- I. PARKS OR RESERVES

- GREEN SPACE
- CITY LIVING
- COMMERCIAL ZONE
- CITY CENTRE

Figure 36. Characteristics of the street identity

- MIXED USED CORRIDOR
- CBD CORRIDOR
- COASTAL CORRIDOR
- CORE EAST-WEST CONNECTION

Figure 37. Tauranga Precinct

- A. WATERFRONT PRECINCT
- B. SPORT PRECINCT/ TAURANGA DOMAIN
- C. CBD
- D. EDUCATION PRECINCT
- E. RETAIL AND COMMERCIAL PRECINCT
- F. SCHOOLS
- G. MAIN CONNECTION: CAMERON RAOD
- H. HIGHWAY CONNECTION

5 MINUTE WALK
FROM CBD

Characteristic of the Tauranga CBD Streets

Pedestrian and Cycle Links

Tauranga City Street Typologies

- Highway 2
- Highway Entrance Point
- City Living Street
- Waterfront Street
- Inner Waterfront Street
- East-west Central Connection
- North-south Central Connection
- Boulevard Street
- Civic Square Laneway
- North-south City Connection
- City Commercial Street
- East-west City Connection
- Railway Bridge Connection
- City Neighbourhood Street

Figure 38. Railway Station Opportunities

8.2 Existing Conditions

The investigated hybrid street typology will be applied and tested on seven different streets and four sites in Tauranga city business district areas (CBD) where have significantly different spatial characteristics to see how it advances key objectives and achieves the research visions.

EXISTING STREETC ONDITIONS ANDT YPES

Legend	
1	Dive Crescent Car Park Area
2	Dive Crescent
3	Waterfront Car Park Area
4	The Strand and Herries Park
5	Harington St
6	Public Car Park
7	Hamilton St
8	Tauranga Council Buildings/ Library Carpark
9	Durham St
10	Wharf St
11	Willow St
	Public Car Parking Area
	Commercial Street
	30km Car Oriented Street
	Tauranga City N-S Main Street

EIGHT SITES FOR THE DESIGN TESTING

DEVONPORT ROAD

0 380m 1900m 3800m 1:3800

WATERFRONT OLD RAILWAY STATION STREET 1: Dive Crescent/ Dive Crescent Parking Areas

Design Objectives:

- 1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
- 2. Linear Park Street (Hybrid Street Type 3)

Key features:

- 9 to 11 metres wide street
- Vehicle dominated street
- Low quality three different car parks

Design Concept:

- New mid-block north–south public transport priority street
- Linear park with a new railway station

Existing Condition

DEVONPORT ROAD

Dive Cres/ Dive Cres Parking Area

1	Traffic Hazard		5	Three Carparks
2	Road right of way (Auto-vehicle Priority Street)		6	Vegetation Buffer/ Fence
3	Crosswalk/ Traffic Island		7	Railway Crossing
4	Sidewalk (for pedestrians)		8	Sidepath adjacent to roadway
5	Striped bike lane		9	Bus Stop

Figure 00. Site Experience

WATERFRONT OLD RAILWAY STATION STREET 2: Herries Park

Design Objectives:

- 1. Linear Park Street (Hybrid Street Type 3)
- 2. Transport Interchange Street (Hybrid Street Type 5)

Key features:

- Limitation to design open space with heavy rail infrastructure
- Discontinuous E-W pedestrian connection to waterfront
- Waterfront car park
- Railway hazard
- Low quality green space

Design Concept:

- Linear park with a new railway platform

Existing Condition

WATERFRONT OLD RAILWAY STATION STREET 2: The Strand

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)
- 3. Commercial Street (Hybrid Street Type 4)

Key features:

- Tauranga main commercial street
- Narrow street, between 7 and 9 metres wide.
- Discontinuous E-W pedestrian connection to waterfront
- Waterfront car park
- Railway hazard
- Low quality green space
- Salvaged clay pavers

Design Concept:

- Low speed shared street

Existing Condition

The Strand/ Herries Park

1	Traffic Hazard
2	Road right of way (30 km Low Speed Waterfront Street)
3	Crosswalk/ Traffic Island
4	Sidewalk (for pedestrians)
5	Waterfront Facilities

5	Carparks
6	Vegetation Buffer/ Fence
7	Railway Pedestrian Crossing
8	Sidepath adjacent to roadway
9	Open Space

Figure 00. Site Experience

E-W RAILWAY STATION CONNECTION STREET: Harington St

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)

Key features:

- 20-22m wide commercial street (including street car parking area)
- Vehicle dominated street
- Lack of amenity for pedestrians
- Minimal green within the street

Design Concept:

- Low speed shared street

DEVONPORT ROAD

Existing Condition

Harington St

1	Traffic Hazard		5	Street Carpark
2	Road right of way (30 km Low Speed E-W Street)		6	Vegetation Buffer/ Fence
3	Crosswalk/ Traffic Island		7	Pedestrian Only Access Car Park
4	Sidewalk (for pedestrians)
5	Bike Park

Figure 00. Site Experience

PUBLIC TRANSPORT PRIORITY SHARED STREET: Hamilton St

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)

Key features:

- 30km car oriented street
- 11 to 12.5 metres wide
- Lack of amenity for pedestrians
- Minimal green within the street

Design Concept:

- Sustainable transport priority street

Existing Condition

Hamilton St

1	Road right of way (30 km Waterfront Entrance)
2	Road right of way (30 km Civic Square Entrance)
3	Crosswalk/ Traffic Island
4	Sidewalk (for pedestrians)
5	Civic Square/ Carparks

Figure 00. Site Experience

N-S CITY CONNECTION STREET: Willow St

Design Objectives:

- 1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
- 2. Active Street (Hybrid Street Type 2)

Key features:

- Tauranga city N-S main street
- 11 to 12.5 metres wide
- Local bus stops/ junctions
- Minimal green within the street

Design Concept:

- Pedestrian priority multi-modal street

Existing Condition

Willow St

1	Road right of way (30 km Waterfront Entrance)
2	Road right of way (30 km Civic Square Entrance)
3	Crosswalk/ Traffic Island
4	Sidewalk (for pedestrians)
5	Bus Station/ Masonic park to Waterfront

Figure 00. Site Experience

BUS INTERCHANGE SPACE: In-between Harington St and Hamilton St

Design Objectives:

1. Transport Interchange Street (Hybrid Street Type 5)

Key features:

- Public car park space
- Empty Buildings

Design Concept:

- Regional bus interchange space

Existing Condition

CIVIC HEART STREET: Wharf St

Design Objectives:

- 1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
- 2. Active Street (Hybrid Street Type 2)

Key features:

- 30km car oriented street
- 11 to 12 metres wide
- Regional bus stops
- Minimal green within the street
- East Wharf St had been developed to Tauranga food district street (pedestrian only street)

Design Concept:

- Sustainable transport priority street

Existing Condition

Wharf St

1	Road right of way (30 km Low Speed E-W Street)
2	Sidewalk (for pedestrians)
3	Crosswalk/ Traffic Island
4	Road right of way (Pedestrian Only Food Street)
5	Street Furnitures / Materials

Figure 00. Site Experience

GREEN STREET PARK: Durham Street

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)

Key features:

- 30km vehicle dominated street
- Narrow carriageway width of 8.5 to 9 metres wide
- Lack of amenity for pedestrians
- Entrance point to Tauranga Civic Square

Design Concept:

- Pedestrian only linear park street

Existing Condition

CIVIC SQUARE TO WATERFRONT: Civic Square/ Masonic Park

- Design Objectives:
- 1.Active Street (Hybrid Street Type 2)
 - 2.Linear Park Street (Hybrid Street Type 3)

- Key features:
- Tauranga Civic Square to Masonic park to Waterfront connection
 - Lack of amenity for pedestrians
 - Two public car parks

- Design Concept:
- Civic Square/ Linear park pedestrian corridor

Existing Condition

Masonic Park

1	Area right of way (Civic Open Space and Park)
2	Crosswalk Connections from Waterfront to Civic Square
3	Sidewalk (for pedestrians)
4	Masonic Park Entrance Points from Waterfront
5	Masonic Park Entrance Points from Willow St

Figure 00. Site Experience

WATERFRONT OLD RAILWAY STATION STREET 1: Dive Crescent/ Dive Crescent Parking Areas

STREET USERS

CYCLISTS

DOING BUSINESS

PRIVATE VEHICLE USERS

CAR PARKING

ACTIVITIES

MODE OF TRANSPORT

WATERFRONT OLD RAILWAY STATION STREET 2: The Strand/ Herries Park

STREET USERS

PEDESTRIANS

DOING BUSINESS

CHILDREN/ PARENT

PEOPLE WITH DISABILITIES

EATING DISTRICT

CAR PARKING

ACTIVITIES

MODE OF TRANSPORT

E-W RAILWAY STATION CONNECTION STREET: Harington St

STREET USERS

PEDESTRIANS

DOING BUSINESS

PRIVATE VEHICLE USERS

STREET CAR PARKING

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

PUBLIC TRANSPORT PRIORITY SHARED STREET: Hamilton St

STREET USERS

PEDESTRIANS

DOING BUSINESS

PRIVATE VEHICLE USERS

STREET CAR PARKING

BUSINESS PEOPLE

ACCOMMODATION USERS

ACTIVITIES

MODE OF TRANSPORT

N-S CITY CONNECTION STREET: Willow St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

TAKING LOCAL TRANSIT USERS

DOING BUSINESS

STREET CAR PARKING

BUSINESS PEOPLE

PEOPLE WITH DISABILITIES

STUDENTS

CHILDREN/ PARENT

ACTIVITIES

MODE OF TRANSPORT

CIVIC HEART STREET: Wharf St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

DOING BUSINESS

TAKING REGIONAL TRANSIT USERS

STREET CAR PARKING

EATING DISTRICT

ACTIVITIES

MODE OF TRANSPORT

GREEN STREET PARK: Durham Street

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

CIVIC SQUARE TO WATERFRONT: Civic Square/ Masonic Park

STREET USERS

PEDESTRIANS

CAR PARKING

DOING BUSINESS

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

09. Design Development

The project has been developed the following five design strategies for the vision of 'Hybrid Street': Sustainable Transport Priority Street, Active Street, Linear Park Street, Commercial Street and Transport Interchange Street on 11 existing sites or streets in Tauranga CBD area. These 'Hybrid Street Typologies' indicate the direction of how to best activate the space for both mobility and community life.

EXISTING STREET CONDITIONS AND TYPES

Legend	
1	Dive Crescent Car Park Area
2	Dive Crescent
3	Waterfront Car Park Area
4	The Strand and Herries Park
5	Harington St
6	Public Car Park
7	Hamilton St
8	Tauranga Council Buildings/ Library Carpark
9	Durham St
10	Wharf St
11	Willow St
	Public Car Parking Area
	Commercial Street
	30km Car Oriented Street
	Tauranga City N-S Main Street

PROPOSED STREET DESIGN/ TYPES

Legend	
1	Dive Crescent Car Parking Area
2	Dive Crescent
3	Waterfront Car Park Area
4	The Strand and Herries Park
5	Harington St
6	Inter-regional Bus Interchange
7	Hamilton St
8	Tauranga Council Buildings/ Library Carpark (Proposed)
9	Durham St
10A	West Wharf St
10B	East Wharf St (Food District)
11	Willow St
	Open Space or Railway Platform Location
	Low Speed Shared Street
	Sustainable Transport Priority Street
	Pedestrian Only Linear Park Street
	Pedestrian Priority Multi-modal Street

Conceptual Approach

Design framework advocates a pedestrian and transit-friendly streetscape connecting the rail lines to encourage street activities on the urban and suburban fabric, and also supports other types of sustainable transport modes. A hybrid term of street typology articulates a vision and strategic approach with design criteria to advance key objectives.

The research objective has been investigated from a research question of 'How to avoid the mono-functional logics of street with its public transport connections and how to translate it to a hybrid space that supports a variety of different types of sustainable transport modes to improve the accessibility between the neighbourhoods, cities, sub-regions and region.

SITES

- 1 Railway Platform A Location & Station Park
: A series of raised and recessed landscape structures, paved areas along the street providing a sequence of urban station park and public transit-friendly street.
- 3 Railway Platform B Location & Station Park
: Vegetation protection, creating two entrance points for regional trips and paved areas along the street providing a sequence of urban station park.
- 6 Regional Bus Interchange & Open Space
: Provide spaces for sustainable transport uses which include walking and cycling, taxi and regional bus.
- 8 Civic Square Plaza
: 1. Provide a pedestrian-only connection from Civic square to Tauranga waterfront area.
2. Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

HYBRID STREETS

- 2 Sustainable Transport Priority Street
: Provide spaces for sustainable transport uses which include walking and cycling, rapid rail and local bus.
- 4 Low Speed Shared Street
: Provide spaces for commercial uses such as shopping and outdoor dining.
- 5 Low Speed Activate Street
: Provide spaces for urban activities such as play-along-the-way, picnic and rest.
- 7 Sustainable Transport Priority Street
: Accessible street to support sustainable transport modes connecting the Bus-Interchange and Railway Platform B.
- 9 Pedestrian Only Linear Park Street
: Creating an accessible street park connecting proposed Hotel area, Civic Square and Waterfront.
- 10 Sustainable Transport Priority Street (West Wharf St) & Food District Street (East Wharf St)
: Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

09. Design Development

9.2. TAURANGA City Streets

Site Plan

Legend.	
New Railway Station Platform A	
1	Existing Parking
2	Commercial Area
3	Reinstated Kerblines and Asphalt Paving
4	Existing Loading Zone
5	Coloured Bike Lane
6	Cobblestone Paving
7	Vegetation Fence
8	Pick Up and Drop Off Point
9	Bench Seats
10	Platform A
11	Native Trees
12	Rain Garden / Filtera System
13	Existing Two Rail Lines
14	Ramps & Handrails
15	Entry / Exit
16	Rain Garden Bridge
17	Bike Park and Bike Racks
18	Railway Station A
19	Public Toilets
Station Park	
20	Relocated Bus Loading Zone
21	Light Sandblast Concrete Paving
22	Reinstated Bus Stop
23	Low Trees
24	Planting with Seating at ends
25	Wall Seating
26	Aluminium Fencing
27	Railway Station Car Park
28	Reinstated Kerblines & Paving
29	Concrete Vehicle Crossings
Dive Crescent	
30	Existing Asphalt Paving
31	Grassed Area
32	Waterfront Concrete Paving Corridor
33	Existing Carriageway with New Line Marking
34	Reinstated Bus Stop
35	Tauranga Waterfront
36	Raised Midblock Crossing
37	Buildouts with Trees and Native Planting
38	Existing Paving & Kerblines
39	Existing Street Parking
40	Dark Basalt Cobblestones Paving
41	Flush Pedestrian Crossing
42	Existing Trees and Hill

Railway Station Platform A

Dive Crescent and Parking Areas

N

0m10m40m

Drawing Name By : Yeseul Kang

Scale: 1:800@A1

Site Programming

Legend.	
	Rail Corridor Boundary
	Public Car Park
	Bus Loading Zone
	Bike Parking
	Street Car Parking
	Green/ Gathering Space
	Activities
	Rain Garden

Movement

Legend.	
----	Pedestrian Movement/ Play
-----	Heavy Pedestrian Movement
—	Cycle Provision
→	Entrance/ Exit Point s
—	Pedestrian Path

WATERFRONT RAILWAY STATION STREET 1: Dive Crescent/ Parking Areas

Public Transport Supported Street

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Linear Park Street (Hybrid Street Type 3)

Railway Platform A Location & Station Park
: A series of raised and recessed landscape structures, paved areas along the street providing a sequence of urban station park and public transit-friendly street.

WATERFRONT RAILWAY STATION STREET 1: Dive Crescent/ Parking Areas

Public Transport Supported Street

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Linear Park Street (Hybrid Street Type 3)

Sustainable Transport Priority Street

: Provide spaces for sustainable transport uses which include walking and cycling, rapid rail and local bus.

Waterfront Railway Station Street 1

- 1 Vegetation Buffer
- 2 Maintenance Zone
- 3 Railway Track
- 4 Station
- 5 Open Space
- 6 Rain Garden
- 7 Footpath
- 8 Cycleway
- 9 Hybrid Street Type 1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

1 Barrier Treatments/ Buffers, and Signage	9 Open Space
2 Hills	10 Bus Stop
3 Railway Corridor	11 Vegetation
4 Railway Platform	12 Transit Priority Street
5 Railway Station	13 Pathway
6 Barrier Treatments/ Buffers, and Signage	14 Flush Pedestrian Crossing
7 Entrance Points	15 Bike Lines
8 Railway Station Park	16 Tauranga Waterfront Corridor

WATERFRONT RAILWAY STATION STREET 1: Dive Crescent/ Parking Areas

Public Transport Interchange Street

Supporting a variety of public transport modes along the transit-friendly designed street. Open spaces are required to offer safety protection boundary between railway platform, station and connected streets.
30km

- Design Objectives:
1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
 2. Linear Park Street (Hybrid Street Type 3)
 3. Transport Interchange Street (Hybrid Street Type 5)

WATERFRONT OLD RAILWAY STATION STREET 1: Dive Crescent/ Dive Crescent Parking Areas

STREET USERS

CYCLISTS

DOING BUSINESS

PRIVATE VEHICLE USERS

CAR PARKING

ACTIVITIES

MODE OF TRANSPORT

WATERFRONT OLD RAILWAY STATION STREET 1: Dive Crescent/ Dive Crescent Parking Areas

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

TAKING LOCAL TRANSIT USERS

DOING BUSINESS

CAR PARKING

CYCLISTS

PEOPLE WITH DISABILITIES

STUDENTS

CHILDREN/ PARENT

ACTIVITIES

MODE OF TRANSPORT

Site Plan

Legend	
Tauranga Waterfront & Carpark	
1	Tauranga Railway Platform B
2	East Side Extended Two Railway Lines
3	Timber Fencing
4	Vegetation Buffer
5	Reinstated kerb line
6	Car Park Vehicle Entrance
7	Waterfront Car Park
8	Pedestrian Only Access to Waterfront
9	Outdoor Eating Tables
10	Concrete Seawall and Rip Rap
11	Waterfront Corridor
12	Green Space
13	Bench seat
Tauranga Railway Station Platform B	
14	Railway Level Crossings
15	Railway Platform B Park Entrance
16	Aluminium Fencing
17	Vegetation Fence
18	Grassed Area
19	Railway Platform Ramps & Handrails
20	Concrete Wall Seating
21	Light Sandblast Concrete Paving
22	Bench seat
23	Vegetation Fence
24	Entry / Exit
25	Salvaged Clay Pavers
26	Railway Canopy
27	Planting with seating at ends
28	Existing trees and planting
29	Flush pedestrian crossing
The Strand	
30	Flush pedestrian crossing
31	Mid-block flush crossing with build outs
32	Relocated Bus Loading Zone
33	Reinstated Bus Stop
34	Entry / Exit Point to Bus Stop
35	Buildouts with trees and native planting
36	Existing roundabout and planting
37	Dark Sandblast Concrete Paving
38	Commercial Area
Harington St	
39	Reinstated kerbline and asphalt paving
40	Garden Mounds Stairwell
41	Seating Area
42	Square-Shape Polished Concrete
43	South Harington St Linear Park
44	Raised Lawn/Garden Mounds
45	Harington St Linear Park Entrance
46	Colour-Honed Concrete
47	Raised Midblock Crossing
48	Buildouts with Trees and Native Planting
49	Street Car Park
50	Flush Pedestrian Crossing
51	White Painted Bike Carriageway
Willow St	
52	New Pedestrian Path
53	Raised Midblock Crossing
54	Existing kerbline and paving
55	One-Side Bike Track
56	North Willow St
McLean St	
57	Green Space
58	McLean Street
Tauranga Bus Interchange	
59	Tauranga Bus Interchange
60	Tauranga Bus Interchange Vehicle Entrance
61	Two-Side Bike Track
62	Coloured Basalt Cobblestone Paving
63	Dark-Gray Striped Concrete Paving

Railway Station Platform B
The Strand/ Herries Park/ Harington St/ Willow St/
McLean St/ Tauranga Bus Interchange

Site Programming

Legend.	
	Rail Corridor Boundary
	Public Car Park
	Bus Loading Zone
	Bike Parking
	Street Car Parking
	Taxi Loading Zone
	Green/ Gathering Space
	Activities

Movement

Legend.	
---	Pedestrian Movement/ Play
---	Heavy Pedestrian Movement
---	Cycle Provision
---	Entrance/ Exit Point s
---	Pedestrian Path

WATERFRONT RAILWAY STATION AREA/ STREET 2: The Strand/ Herries Park

Waterfront Precinct Shared Spaces

Design Objectives:

Design Objectives:

1. Linear Park Street (Hybrid Street Type 3)
2. Commercial Street (Hybrid Street Type 4)
3. Transport Interchange Street (Hybrid Street Type 5)

Railway Platform B Location & Station Park
: Vegetation protection, creating two entrance points for regional trips and paved areas along the street providing a sequence of urban station park.

Detail Drawing (1:500) in A3

WATERFRONT RAILWAY STATION AREA/ STREET 2: The Strand/ Herries Park

Waterfront Precinct Shared Spaces

Design Objectives:

Design Objectives:

1. Linear Park Street (Hybrid Street Type 3)
2. Commercial Street (Hybrid Street Type 4)
3. Transport Interchange Street (Hybrid Street Type 5)

Low Speed Shared Street

: Provide spaces for commercial uses such as shopping and outdoor dining.

WATERFRONT CORRIDORS

Waterfront Railway Station 2

- 1 Footpath
- 2 Vegetation Buffer
- 3 Verge
- 4 Barriers
- 5 Rail
- 6 Embankment
- 7 Open Space
- 8 Natural Barrier
- 9 Harbour Bus/ Ferry Stops

① Hamilton Street	⑪ The Strand Commercial Street
② Herries Park (Station Park)	⑫ Waterfront Playground
③ Barrier Treatments/ Buffers, and Signage	⑬ Tidal Steps
④ Railway Platform B	⑭ Waterfront Corridor
⑤ Tauranga Waterfront Carpark	⑮ Public Toilets
⑥ Open/ Green Space	⑯ Vehicle Access Point
⑦ Flush Pedestrian Crossing	⑰ Pedestrian Level Crossings
⑧ Railway Corridor	⑱ Flush Pedestrian Crossing
⑨ Entrance Point	⑲ Wharf Street
⑩ Masonic Park with Light Sandblast Concrete Paving	

WATERFRONT RAILWAY STATION AREA/ STREET 2: The Strand/ Herries Park

Waterfront Precinct Shared Spaces

Railway Platform B Location & Station Park : Waterfront street and Corridor which are transformed into shared spaces which support pedestrian amenity, occupation and street activity. Railway Platform B is designed with vegetation protection, creating two entrance points for regional train trips and paved areas along the street providing a sequence of urban station park. 15km

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Linear Park Street (Hybrid Street Type 3)
3. Commercial Street (Hybrid Street Type 4)

WATERFRONT OLD RAILWAY STATION STREET 2: The Strand/ Herries Park

STREET USERS

PEDESTRIANS

DOING BUSINESS

CHILDREN/ PARENT

PEOPLE WITH DISABILITIES

EATING DISTRICT

CAR PARKING

ACTIVITIES

MODE OF TRANSPORT

WATERFRONT OLD RAILWAY STATION STREET 2: The Strand/ Herries Park

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

TAKING LOCAL TRANSIT USERS

CAR PARKING

DOING BUSINESS

EATING DISTRICT

PEOPLE WITH DISABILITIES

STUDENTS

CHILDREN/ PARENT

ACTIVITIES

MODE OF TRANSPORT

Harington Street

East-West Railway Station Access

Design Objectives:

Design Objectives:

1. Active Street (Hybrid Street Type 2)
2. Linear Park Street (Hybrid Street Type 3)

Low Speed Activate Street

: Provide spaces for urban activities such as play-along-the-way, picnic and rest.

E-W Railway Station Street

- 1 Building Frontage
- 2 Footpath
- 3 Low Speed Traffic Zone
- 4 Vegetation Buffer
- 5 Linear Park Street
- 6 Commercial Area

- ① Building Frontage
- ② Low Speed Shared Street
- ③ Raised Lawn/ Garden Mounds
- ④ Linear Street Park
- ⑤ Street Parking
- ⑥ Flush Pedestrian Crossing
- ⑦ Cycle Shared Street
- ⑧ West Harington Street
- ⑨ Willow Street
- ⑩ Taxi Stop
- ⑪ Entrance
- ⑫ Bus Interchange
- ⑬ Fence
- ⑭ N-S Linear Street Park
- ⑮ The Strand
- ⑯ Railway Station Bus Stop
- ⑰ Herries Park (Station Park)
- ⑱ Railway Platform Entrance 1
- ⑲ Railway Platform B

Harington Street

East-West Railway Station Access

Low speed shared street which offers active spaces for urban activities such as shopping, outdoor dining and play-along-the-way.
15km

Design Objectives:

- 1. Active Street (Hybrid Street Type 2)
- 2. Linear Park Street (Hybrid Street Type 3)

E-W RAILWAY STATION CONNECTION STREET: Harington St

STREET USERS

PEDESTRIANS

DOING BUSINESS

PRIVATE VEHICLE USERS

STREET CAR PARKING

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

E-W RAILWAY STATION CONNECTION STREET: Harington St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

CYCLISTS

STREET CAR PARKING

DOING BUSINESS

EATING DISTRICT

PEOPLE WITH DISABILITIES

BUSINESS PEOPLE

CHILDREN/ PARENT

ACTIVITIES

MODE OF TRANSPORT

Site Plan

Legend.	
Tauranga Civic Square	
1	Civic Square
2	Open/ Public Space
3	Civic Square Stairwell
4	Ramp and wheelchair access
5	Northern Exit to Hamilton St
6	Light Sandblast Concrete Paving
7	Enclosed Seating Area
8	Southern Exit to Wharf St
Wharf St	
9	Buildouts with trees and native planting
10	West Wharf St
11	Basalt Cobblestone Paving
12	One-Side Bike Track
13	Raised Midblock Crossing
14	Light Sandblast Concrete Paved Pathway
15	Laneway
16	Coloured Basalt Cobblestone Paving
17	Wharf St - Eating District
Willow St	
18	South Willow St
19	Dark-Gray Striped Concrete Paving
20	Shared Street - Willow St
21	Buildouts with Trees and Native Planting
22	One-Side Bike Track
23	Mid-block flush crossing with build outs
24	Stainless Steel Bollards
25	Buildouts with Trees and Native Planting
26	Reinstated Bus Stop
27	Relocated Bus Loading Zone
28	Civic Square Intersection Point
Hamilton St	
29	Hamilton St to Waterfront
30	Bike Crossing
31	Bench seat
32	Dark Sandblast Concrete Paving
33	Street Bike Park
34	Planting with seating
35	Two-Side Bike Track
36	Flush Pedestrian Crossing
37	White Painted Bike Carriageway
38	Traffic Island
39	West Hamilton St
Durham St	
40	Existing 45° Car Park
41	North Durham St
42	Reinstated kerb line
43	Raised Lawn/Garden Mounds
44	Garden Mounds Stairwell
45	Outdoor Eating Tables
46	Greenery Area
47	Western Exit to Durham St
48	Reinstated kerb line
49	Square-Shape Polished Concrete
50	Reinstated kerblines and Paving
51	South Durham St
52	Vehicle Entrance to Car Park
Masonic Park	
53	Masonic Park with Light Sandblast Concrete Paving
54	Concrete Wall Seating Transforming to Dark Greenery Paving
55	Planting with seating at ends
56	Native Trees
57	Fine Grain Space
58	Laneway

Tauranga Civic Square

Civic Square/ Durham, West Hamilton and Wharf St

N

0m10m40m

Drawing Name By: Yeseul KangScale: 1:800@A1

Site Programming

Movement

Legend.	
	Pedestrian Movement/ Play
	Heavy Pedestrian Movement
	Cycle Provision
	Entrance/ Exit Point s
	Pedestrian Path

BUS INTERCHANGE SPACE

Starting point of Inter-Regional Journey

Design Objectives:

Design Objectives:

1. Transport Interchange Street (Hybrid Street Type 5)

Regional Bus Interchange & Open Space

: Provide spaces for sustainable transport uses which include walking and cycling, taxi and regional bus.

Bus Interchange Space

- 1 Regional Bus Interchange
- 2 Street Furnitures
- 3 Green Laneway
- 4 Commercial Share Zone

Hamilton Street (West)

East-West Sustainable Transport Priority Street

Design Objectives:

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)

Hamilton Street (East)

East-West Sustainable Transport Priority Street

Design Objectives:

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)

Sustainable Transport Priority Street

: Accessible street to support sustainable transport modes connecting the Bus-Interchange and Railway Platform B.

Public Transport Priority Shared Street

- 1 Bus Interchange
- 2 Footpath
- 3 Buffer Zone
- 4 Double Side Cycleway
- 5 PT Priority Shared Street
- 6 Cycle Parking
- 7 Street Furnitures
- 8 Open Street
- 9 Civic Square Entrance Point

- 1 Willow Street
- 2 Inter-Regional Bus Interchange
- 3 East Hamilton Street
- 4 Buildouts with Trees and Native Planting
- 5 Basalt Cobblestones Paving
- 6 On-Street Bike Parking
- 7 Seating Area
- 8 Taxi Loading Zone
- 9 Pedestrian Corridor To Masonic Park
- 10 Vehicle Entrance To Bus Interchange
- 11 Green Fence
- 12 Pedestrian Entrance to Bus Interchange
- 13 Hamilton to Harington Street Pedestrian Corridor
- 14 N-S Linear Street Park
- 15 Cycle Shared Street
- 16 Cycle Lane
- 17 The Strand (Waterfront Street)

Hamilton Street (East)

East-West Sustainable Transport Priority Street

East-west connected Hamilton street provides accessible spaces for sustainable transport uses which include walking and cycling, rapid rail and local bus. Supporting a variety of public transport modes along the transit-friendly designed street enhances street connectivities not only in public transport (Bus Interchange - Railway Platform B) but also pedestrian amenity (Open views to the harbour).

30km

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)

PUBLIC TRANSPORT PRIORITY SHARED STREET: Hamilton St

STREET USERS

PEDESTRIANS

DOING BUSINESS

PRIVATE VEHICLE USERS

STREET CAR PARKING

BUSINESS PEOPLE

ACCOMMODATION USERS

ACTIVITIES

MODE OF TRANSPORT

PUBLIC TRANSPORT PRIORITY SHARED STREET: Hamilton St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE/ TAXI USERS

TAKING REGIONAL TRANSIT USERS

CAR PARK BUILDING

DOING BUSINESS

EATING DISTRICT

ACCOMMODATION USERS

CYCLISTS

BICYCLE PARKING

ACTIVITIES

MODE OF TRANSPORT

Willow Street

North-South City Connection Street

Design Objectives:

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)

Willow Street

North-South City Connection Street

Design Objectives:

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)

N-S City Connection Street

- 1 Civic Square
- 2 Open Space for Transit Exchanges
- 3 Local Bus Station
- 4 Transit Priority Street
- 5 Commercial Street
- 6 Waterfront Entrance Point

- ① South Willow Street
- ② Pedestrian Only Food District
- ③ Low Speed Wharf Street
- ④ Coloured Bike Lane
- ⑤ City Commercial Street
- ⑥ Barrier Treatments/ Buffers, and Signage
- ⑦ Masonic Park
- ⑧ Flush Pedestrian Crossing
- ⑨ Civic Square / Open Plaza
- ⑩ Bus Stop
- ⑪ Loading Zone
- ⑫ Transit Priority Hamilton Street
- ⑬ Cycle Crossing Lane
- ⑭ Double Side Cycle Lane
- ⑮ West Hamilton Street
- ⑯ Civic Square Northern Entrance

Willow Street

North-South City Connection Street

Provide commercial activities such as shopping, outdoor dining and play-along-the-way. The commercial street includes 'Food District Street' and 'City Living Street'.

15km

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)

N-S CITY CONNECTION STREET: Willow St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

TAKING LOCAL TRANSIT USERS

DOING BUSINESS

STREET CAR PARKING

BUSINESS PEOPLE

PEOPLE WITH DISABILITIES

STUDENTS

CHILDREN/ PARENT

ACTIVITIES

MODE OF TRANSPORT

N-S CITY CONNECTION STREET: Willow St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

TAKING LOCAL TRANSIT USERS

CHILDREN/ PARENT

DOING BUSINESS

EATING DISTRICT

PEOPLE WITH DISABILITIES

CYCLISTS

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

Wharf Street West

East-West Pedestrian Priority Street

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)
3. Commercial Street (Hybrid Street Type 4)

Sustainable Transport Priority Street (West Wharf St)
& Food District Street (East Wharf St)
: Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

Pedestrian-Priority Spaces

- ① Frontage Zone
- ② Clear Path
- ③ Street Furniture Zone
- ④ Cycleway
- ⑤ Buffer Zone
- ⑥ Public Transit Corridor

Wharf Street West

East-West Pedestrian Priority Street

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)
3. Commercial Street (Hybrid Street Type 4)

Sustainable Transport Priority Street (West Wharf St)
 & Food District Street (East Wharf St)
 : Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

- ① South Willow Street
- ② Delivery Truck Loading Zone
- ③ Public Bicycle Racks
- ④ Pedestrian-Only Central Clearway
- ⑤ Dining Precinct
- ⑥ Garden Bed
- ⑦ Commercial Zone
- ⑧ Previous Vehicle Access

- ⑨ Civic, Cultural and Commercial Hub
- ⑩ Street Furnitures
- ⑪ Poles With Art Works
- ⑫ LED Catenary Lighting System
- ⑬ Salvaged Clay Pavers
- ⑭ Stainless Steel Bollards
- ⑮ City Centre To Tauranga Harbour
- ⑯ The Strand

Wharf Street East

Pedestrian Only Food District

Sustainable Transport Priority Street (West Wharf St) & Food District Street (East Wharf St):

1. Offering a central clearway which is uniquely combined with art, culture and cuisine.
2. Provide a safe pedestrian connection from city centre to Tauranga harbour.
3. New lighting system, native planting, seats, and bike racks create a vibrant place day and night to support urban activities.

0km

Design Objectives:

1. Street Focused on Sustainable Transport Modes (Hybrid Street Type 1)
2. Active Street (Hybrid Street Type 2)
3. Commercial Street (Hybrid Street Type 4)

CIVIC HEART STREET: Wharf St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

DOING BUSINESS

TAKING REGIONAL
TRANSIT USERS

STREET CAR PARKING

EATING DISTRICT

ACTIVITIES

MODE OF TRANSPORT

CIVIC HEART STREET: Wharf St

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

STREET CAR PARKING

STUDENTS

DOING BUSINESS

EATING DISTRICT

ACCOMMODATION USERS

CYCLISTS

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

Durham Street

Civic Heart Street

Design Objectives:

1. Active Street (Hybrid Street Type 2)
2. Linear Park Street (Hybrid Street Type 3)

Pedestrian Only Linear Park Street
: Creating an accessible street park connecting proposed Hotel area, Civic Square and Waterfront.

- ① South Durham Street
- ② Wharf Street to Waterfront
- ③ Wharf Street to Cameron Road
- ④ Reinstated Kerbline and Paving
- ⑤ Street Furnitures
- ⑥ Outdoor Eating Tables
- ⑦ (Proposed) Hotel Area
- ⑧ Pedestrian Path

- ⑨ Kerbline
- ⑩ Civic Square Western Entrance
- ⑪ Raised Lawn/Garden Mounds
- ⑫ Wall Seatings
- ⑬ Rounded Cycle Rack
- ⑭ Hamilton Street to Cameron Road
- ⑮ North Durham Street
- ⑯ Hamilton Street

Durham Street

Civic Heart Street

Creating an accessible street park connecting proposed Hotel area, Civic Square and Waterfront. A pedestrian-only connected linear park creates an safe and accessible street plaza to offer urban activities such as walking and cycling, play-along-the-way, picnic and rest between the Northern part of Durham street, proposed Civic Square and Tauranga Waterfront.

0km

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)

GREEN STREET PARK: Durham Street

STREET USERS

PEDESTRIANS

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

GREEN STREET PARK: Durham Street

STREET USERS

PEDESTRIANS

PEOPLE WITH DISABILITIES

CHILDREN/ PARENT

STUDENTS

DOING BUSINESS

EATING DISTRICT

ACCOMMODATION USERS

CYCLISTS

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

Site Plan

Legend.	
Masonic Park	
1	Civic Square
2	Stainless Steel Bollards
3	Mid-block flush crossing with build outs
4	Native Trees
5	Planting with seating at ends
6	Masonic Park with Light Sandblast Concrete Paving
7	Laneway
8	Fine Grain Space
9	Concrete Wall Seating Transforming to Dark Greenery Paving
10	Raised Lawn/Garden Mounds
11	Entrance Point to Masonic Park
12	Buildouts with Trees and Native Planting
13	Stainless Steel Bollards
14	Mid-block flush crossing with Railway Level Crossing
15	Railway Park Entrance
16	Railway Platform B Entrance Point
17	Vegetation Fence
18	Rail Corridor
19	Vegetation Fence
20	Dark-Gray Striped Concrete Paving
Herries Park	
21	Concrete Wall Seating
22	Railway Canopy
23	Existing trees and planting
24	Flush Pedestrian Crossing
25	Vegetation Fencing
26	Planting with seating at ends
27	Light Sandblast Concrete Paving
28	Aluminium Fencing
29	Railway Park
30	Salvaged Clay Pavers
31	Entry / Exit
Tauranga Waterfront	
32	Timber Fencing
33	Green Space
34	Reinstated kerb line
35	Waterfront Car Park
36	Vegetation Buffer
37	Previous Pedestrian Level Crossing Connection Point
38	Tauranga Seafront
39	Playground
40	Outdoor Eating Tables
41	Recreational Pier
42	Open Space
43	Tidal Stair
44	Grassed Area
45	Public Toilet
46	Concrete seawall and rip rap
47	Pedestrian Level Crossings
48	Railway Extension
49	Waterfront Corridor
50	Car Park Entrance
The Strand	
51	Loading Zone
52	Greenery Space with Aluminium Fencing
53	The Strand - Dark Sandblast Concrete Paving
54	Commercial Area
Hamilton St/ Willow St/ Wharf St	
55	Hamilton St - Basalt Cobblestones Paving
56	Pedestrian Path - Light Sandblast Concrete Paving
57	Coloured Bike Lane
58	Shared Street - Willow St
59	West Wharf St - Basalt Cobblestone Paving
60	Stainless Steel Bollards
61	Wharf St - Eating District

Masonic Park to Waterfront

Masonic Park/ Herries Park/ Tauranga Waterfront/ The Strand/ Hamilton St, Willow St and Wharf St

Site Programming

Movement

Legend.	
	Pedestrian Movement/ Play
	Heavy Pedestrian Movement
	Cycle Provision
	Entrance/ Exit Point s
	Pedestrian Path

CIVIC SQUARE TO WATERFRONT

Civic Square to Waterfront

Design Objectives:

Design Objectives:

1. Active Street (Hybrid Street Type 2)
2. Linear Park Street (Hybrid Street Type 3)

Civic Square Plaza

- : 1. Provide a pedestrian-only connection from Civic square to Tauranga waterfront area.
2. Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

- ① Pedestrian Only Linear Park Street
- ② Civic Square Western Entrance
- ③ Civic Square Stairwell
- ④ Southern Exit to Wharf Street
- ⑤ Open/Public Space
- ⑥ Ramp and Wheelchair Access
- ⑦ Civic Square Eastern Entrance
- ⑧ Flush Pedestrian Crossing with build outs
- ⑨ Masonic Park to Waterfront
- ⑩ Willow Street
- ⑪ Cycle Crossing Lane
- ⑫ Northern Exit to Hamilton Street
- ⑬ Double Side Cycle Lane
- ⑭ Hamilton Street

CIVIC SQUARE TO WATERFRONT

Civic Square to Waterfront

Civic Square/ Centre Plaza establishes a pedestrian-only connection from Civic square to Tauranga waterfront area and it offers a range of activities distinctive from the retail and commercial city centre.
0km

Design Objectives:

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)

CIVIC SQUARE TO WATERFRONT

Civic Square to Waterfront

Design Objectives:

1. Active Street (Hybrid Street Type 2)
2. Linear Park Street (Hybrid Street Type 3)

Civic Square Plaza

- : 1. Provide a pedestrian-only connection from Civic square to Tauranga waterfront area.
2. Offering urban activities including walking and cycling, play-along-the-way, picnic and rest.

- ① Civic Square Eastern Entrance
- ② Willow Street
- ③ Willow Street Bollards
- ④ Public Bicycle Racks
- ⑤ Public Seating
- ⑥ Pedestrian-Only Central Clearway
- ⑦ Civic, Cultural and Commercial Hub
- ⑧ Outdoor Restaurant Seating
- ⑨ Garden Bed
- ⑩ New tree
- ⑪ Masonic Park with Light Sandblast Concrete Paving
- ⑫ Herries Park (Station Park)
- ⑬ Railway Platform B
- ⑭ Second Entrance to Platform B
- ⑮ Railway Corridor
- ⑯ Tauranga Waterfront Carpark
- ⑰ City Centre To Tauranga Harbour
- ⑱ The Strand Commercial Street
- ⑲ Pedestrian Level Crossings
- ⑳ Vehicle Access Point

CIVIC SQUARE TO WATERFRONT

Civic Square to Waterfront

Civic Square/ Centre Plaza establishes a pedestrian-only connection from Civic square to Tauranga waterfront area and it offers a range of activities distinctive from the retail and commercial city centre.

0km

Design Objectives:

Design Objectives:

- 1.Active Street (Hybrid Street Type 2)
- 2.Linear Park Street (Hybrid Street Type 3)

CIVIC SQUARE TO WATERFRONT : Civic Square/ Masonic Park

STREET USERS

PEDESTRIANS

CAR PARKING

DOING BUSINESS

PRIVATE VEHICLE USERS

ACTIVITIES

MODE OF TRANSPORT

CIVIC SQUARE TO WATERFRONT : Civic Square/ Masonic Park

STREET USERS

PEDESTRIANS

PEOPLE WITH DISABILITIES

CHILDREN/ PARENT

STUDENTS

DOING BUSINESS

EATING DISTRICT

TAKING PUBLIC TRANSIT USERS

CYCLISTS

BUSINESS PEOPLE

ACTIVITIES

MODE OF TRANSPORT

10. Conclusion

- 10.1. A Key Transformation and Design Outcomes
- 10.2. Design Limitations and Further Study
- 10.3. Conclusion

10.1 A Key Transformation

TYPICAL STREET TYPOLOGY

BEFORE

- 1. Engineering focused street design.
- 2. Mono functional support.
- 3. Location focused design.
- 4. Low connectivity with other types of vehicle.
- 5. Limit targeted users.
- 6. Streets are based on single-use zoning and heavy automobile usage create poor environments for people.

HYBRID STREET TYPOLOGY

AFTER

- 1. Landscape architecture focused public space design.
- 2. Multi functional support.
- 3. Amenity focused design.
- 4. Connectivity with other types of vehicle and surrounded facilities.
- 5. Access for everyone.
- 6. Hybrid street which provides a wide variety of activities to promote vibrant community.

10.2 Reflections

: Limitations and Further Study

As with the majority of street typology studies, the findings of the research identifies a few limitations. Due to the scope of the site for the final design testing, there were some challenges and limitations throughout the process in the design stage; 1. Site scale, and 2. Site locations.

The project has been developed the following five design strategies for the vision of ‘Hybrid Street’: Sustainable Transport Priority Street, Active Street, Linear Park Street, Commercial Street and Transport Interchange Street on 11 existing sites or streets in Tauranga CBD area. However, those 11 Tauranga city streets did not show significant differences in their street identity, then there were some limitations to test the variety of hybrid street typologies. To better understand the implications of the results, future studies could further address in different regions on different types of streets.

10.3 Conclusion

The research, 'Hybrid Street Design' advocates a pedestrian and transit-friendly streetscape connecting the rail lines to encourage street activities on the urban and suburban fabric, and also supports other types of sustainable transport modes. A hybrid term of street typology articulates a vision and strategic approach with design criteria to advance key objectives.

A range of options/typologies were considered for achieving the objectives of creating the desired human focused street environment and transport sustainability.

To achieve the research question, existing studies and reviews of street typology needed to be dealt with to understand the basic roles of transit street's characteristics in 'Literature Review'. Through a 'Design Criteria' stage, an articulate 'Hybrid Street Typology' was defined to use in 'Design Stage'.

Having carried out that investigation, the five hybrid street typologies have been identified through the research study. The five hybrid street typologies take into account the scale, density, diversity of destinations, quality of place as well as the significance of movement by different modes.

The investigated hybrid street typology has been applied and tested into the seven different streets and four sites in Tauranga city centre where have significantly different spatial characteristics.

The site analysis was performed in two different study areas. First, to define existing street conditions and second, establishing Tauranga street typologies.

Eleven areas (four sites and seven streets) had been designed through the developing stage with identified specific names which were 1 Public transport interchange street, 2 Waterfront precinct shared spaces, 3 East-west railway station access, 4 East-west sustainable transport priority street, 5 North-south city connection street, 6 West Wharf: Sustainable Transport Priority Street & East Wharf: Food District Street, 7 Civic heart street, 8 Civic square to waterfront street.

The project has been developed the following five design strategies for the vision of 'Hybrid Street'. Eleven designed streets show significant differences in a single detailed design but their overall spatial identity seems similar then there were some limitations to test the variety of hybrid street typologies. To better understand the implications of the results, future studies could further address on different region's streets which has significantly different landscape architectural environments and scales.

Nonetheless a few limitations, I believe 'Hybrid Functioned Street Design Study' suggests a solution to improve current issues and indicates a good strategy for supporting a government's long-term plan and furthermore, the vision of a new street design guideline.

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Figure 28. Design Strategy (2021). Victoria University. Dorothy Kang.

Figure 29. Tauranga City's Streets (2021). Victoria University. Dorothy Kang.

Figure 30. Old Tauranga Station Layout (2021). Victoria University. Dorothy Kang.

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Figure 51. Omokoroa Station Idea Sketch (2021). Victoria University. Dorothy Kang.

Figure 1. Railway Platform Configuration/ Edge Plan

Figure 2. Platform Configurations/ Dimensions

Figure 4. Integration Of Engineering And Operational Elements - Platforms

Figure 6. Rail Corridor Landscape Buffer Example 1 and 2.

Figure 5. Station Context And Urban Integration

PRECEDENT STUDIES : RAILWAY STATION DESIGNS/ LAYOUTS

KPL: KAPITI LINE

Figure 7-14. Wellington Railway Station Precedents

PRECEDENT STUDIES : RAILWAY STATION DESIGNS/ LAYOUTS
HVL: HUTT VALLEY LINE

Figure 15-18. Wellington Railway Station Precedents

TYPOLOGY STUDIES : STREET TYPES/ SPECIFICATIONS (PREVIEW - BEFORE VISUALISATION)

Figure 19-25. Typology Studies

The investigated hybrid street typology will be applied and tested on 11 different streets in Tauranga city business district areas (CBD) where have significantly different spatial characteristics to see how it advances key objectives and achieves the research visions.

DESIGN SKETCHES : TAURANGA STATION/ STREET DESIGN SKETCHES
DESIGN CONTEXT

Figure 26. Site Context

Figure 27. Existing Street Conditions

Figure 28. Design Strategy

Figure 29. Tauranga City's Streets

Figure 30. Old Tauranga Station Layout

Figure 31. Railway Extension (Possibility)

Figure 32. Railway Crossing Measures

Figure 33. Final Decisions For Train Lines

Figure 34. Railway Crossings

DESIGN SKETCHES : TAURANGA STATION/ STREET DESIGN SKETCHES
CONCEPT DESIGN

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Figure 37. Station Site B

Figure 38. Station Site A: Platform Idea

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Figure 40. Two Station's Sites

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DESIGN SKETCHES : TAURANGA STATION/ STREET DESIGN SKETCHES

CONCEPT DESIGN

Figure 44. Station Park (Herries Park)

Figure 45. Station Park Details Design

Figure 46. Station Park Connections

Figure 47. Platform Ramp Designs and Calculation

FURTHER STUDY : WESTERN BAY OF PLENTY CONTEXT STUDIES
OMOKOROA/ TE PUNA

Figure 48. Moving Forward/ BOP Long Term Plan

Figure 49. Street Typology in Omokoroa and Te Puna

Figure 50. Omokoroa Existing Street Conditions

Figure 51. Omokoroa Station Idea Sketch

SITE PLAN

Dive Crescent/ The Strand/ Masonic Park/ Herries Park/
Tauranga Waterfront/ The Strand, Harington St, Hamilton St,
Willow St, Wharf St and Durham St/ Tauranga Bus
Interchange/ Civic Square (Proposal)

0m 40m 120m

Drawing Name By : Yeseul Kang Scale: 1:800@A0