

Appendix A

Study Context

Appendix A Project Background and Current Situation

This section of the Inception and Scoping Report details the context in which the Wellington Public Transport Spine Study (Study or the Study) has been undertaken. The background, study area and current situation are used to characterise the Study from different but related perspectives. This context then allows the key factors to emerge, which will then feed in to the option selection and development process.

Project Background

The Study is a joint study led by Greater Wellington Regional Council (Greater Wellington) in partnership with the New Zealand Transport Agency (NZTA) and Wellington City Council (WCC).

This Study is one of the recommendations of the multi-modal Ngauranga to Airport (N2A) Corridor Plan¹⁰ adopted by the Regional Transport Committee in 2008. This study is undertaken in the context of the N2A Corridor Plan and takes account of the investigations carried out in developing that plan.

History of Public Transport in Wellington

In the mid-1870s the first railway line from Wellington to Lower Hutt was constructed. This was followed by the construction of the Kapiti railway line from Wellington via Johnsonville in the early 1880s. A deviation to bypass Johnsonville was constructed in the mid-1930s and this became the North Island Main Trunk (NIMT). The NIMT was electrified to Paekakariki in 1940 followed by the systematic electrification of the other Wellington lines in the 1940s and 1950s. In 2009 and 2010 the Wellington Regional Rail Programme saw the introduction of the Matangi Electric Multiple Units and other regional infrastructure upgrades including extending the double tracking and electrification through to Waikanae.

In August 1878, the first tram route was opened in Wellington with a service between Lambton Quay and the Basin Reserve. The trams were electrified in the early 1900s as other tram lines were added to create a network of routes to Aro Valley, Karori, Wadestown, Oriental Bay, Miramar, Seatoun, Lyall Bay, Island Bay and Brooklyn. In the late 1940s and early 1950s the tramways were converted to buses and trolley buses. Figure 6 illustrates the extent of this tramway network.

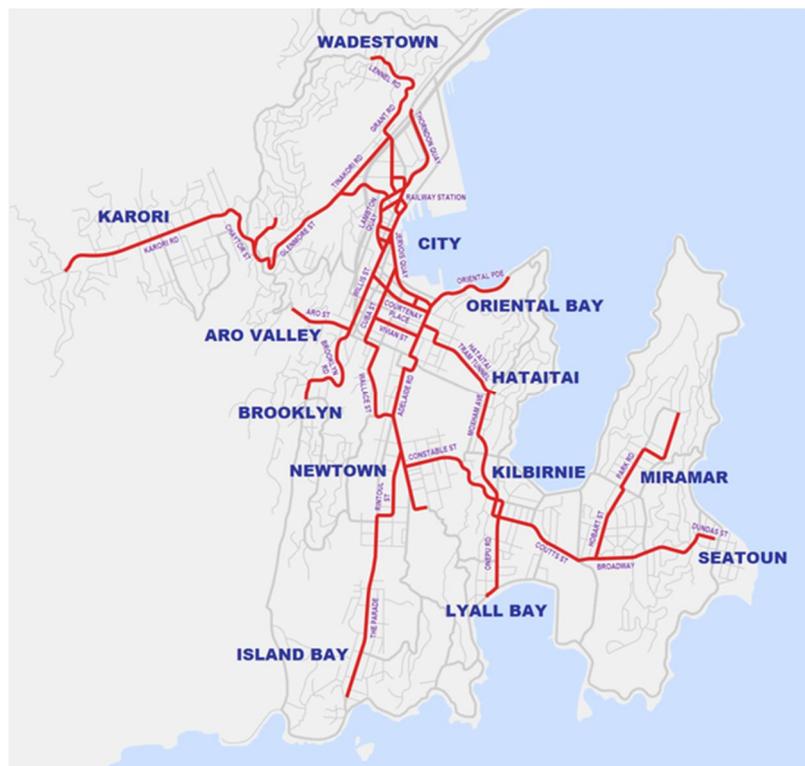


Figure 6 Map of the Wellington tramway network at its greatest extent

¹⁰ Ngauranga to Airport Corridor Plan 2008

Wellington Public Transport Studies

General

The Study team reviewed in excess of 65 reference documents as part of the project inception and scoping stage.

The purpose of the reviews was to identify relevant information including existing arrangements, dependencies, constraints, land use, and economic data and also to understand the realistic range of integrated spatial planning and public transport options. A summary table listing the documents reviewed is located in Appendix E. The key reports reviewed are summarised below.

Comprehensive Transportation Plan for Wellington, New Zealand, 1963

In 1963, the City of Wellington commissioned the *Comprehensive Transportation Plan*, which examined long-range transportation improvements, including public transport in the City of Wellington. The plan focused on the railway service for public transport improvements and also noted that better rail-bus transfer facilities were required.

The plan identified a railway extension through the central business district as the best means for improving public transport capacity. Two underground route extensions from the Wellington Railway Station were identified. The preferred route travelled under The Terrace, Manners Street and terminated at Courtney Place. A second scheme continued through to the regional hospital. It was noted that there was little economic justification to extend the railway until at least the completion of the Foothill Motorway. The plan recommended that the broad public transport problem should be re-examined after the completion of the Foothill Motorway.

Study of Public Transport Options Johnsonville-Wellington CBD Corridor

In 1993, Wellington City Council and Greater Wellington Regional Council commissioned the *Study of Public Transport Options Johnsonville-Wellington CBD Corridor*. This study focuses on the rail corridor between Johnsonville and the Wellington CBD and identifies public transport options for the northern suburbs.

The study considered four scenarios; improvements to the existing rail services, replacement of rail with on street buses, replacement of rail with a guided busway and replacement of rail with light rail possibly extended into the CBD. The study also considered other modes of transport such as monorails and trolley buses, however these were discounted. The scenarios were assessed through a rigorous evaluation framework. The framework covered; capital costs, operating costs, user cost and benefits, road users, environmental and commercial impacts.

The results were used for public consultation prior to Greater Wellington Regional Council determining future policy for services in the Johnsonville – Wellington CBD corridor. The results did not recommend a preferred option but provided a comparison of all options.

Light Rail Feasibility Study

In 1995, Wellington City Council and Greater Wellington Regional Council commissioned the *Light Rail Transit Feasibility Study*. The study considered the initial feasibility of providing a light rail system on the suburban rail network and through the CBD. The study identified a number of benefits that Light Rail Transit (LRT) could provide Wellington. The study also identified route options, planning, environmental, legislative ownership and funding issues and provided an assessment of the financial and economic viability of converting the existing network to LRT.

The study tested a range of options against the conversion of the Johnsonville rail line to LRT with it terminating at Wellington Railway Station. All options compared were deemed worthwhile. Resolution of a number of issues was however required before a final choice could be made. These issues included funding, ownership, Resource Management Act implications and detailed community consultation.

The study assumed that a LRT route through the CBD would be an extension of the existing Johnsonville Route. Three route options through the CBD were identified with two alternate route sections. All three commenced at the west of the Railway Station and terminated in Courtenay Place.

North Wellington Public Transport Study

In 2005, Wellington City Council and Greater Wellington Regional Council commissioned the *North Wellington Public Transport Study*. The study identified options for future public transport in Wellington's northern suburbs and developed a strategic framework for future investment in public transport.

The study considered four scenarios; improvements to the existing rail services, replacement of rail with on street buses, replacement of rail with a guided busway and replacement of rail with light rail possibly extended into the CBD. The scenarios were compared to a base case of replacing the English Electric Units with Ganz Mavag and minimum rail improvements. Of these scenarios, the on street bus performed the best in terms of economic performance. However due to expectations and associated risks the base case was recommended. The light rail scenario had a poor economic performance based on the requirements of the northern suburbs alone.

The scenarios were evaluated in terms of the then draft objectives in the Greater Wellington Regional Land Transport Strategy. The scenarios were checked against criteria formed from the draft objectives, including: average travel costs, travel safety, improved mobility access and network reliability, public health, sustainability and economic efficiency and affordability.

Bus Operational Review

In 2009, Greater Wellington Regional Council commissioned the Central Area Bus Operational Review. The review covered public transport on the Golden Mile between Wellington Railway Station and Kent and Cambridge Terrace. The review focussed on options for improving the efficiency and reliability of bus operations through the Wellington central area. The review identified current issues and options for improving the efficiency and reliability of bus services through the Golden Mile. Key priorities were identified for the short, medium and long term and an indicative improvement programme was recommended.

Issues identified included; poor legibility due to the split route, insufficient stop capacity, variability in bus occupancy and passenger loading inefficiencies. Measures identified to address these issues include; investigation of suburban hubs and relocation of road space in the long term, integrated ticketing and bus stop layout and design in the medium term and bus priority and schedule reviews in the short term. The review concludes that significant opportunity exists to enhance public transport operation on the Golden Mile through a mixture of infrastructure and operation interventions.

2011 Regional Public Transport Plan (RPTP)

The PTSS outcome is to be well integrated with the concepts being developed as part of the 2011 Regional Public Transport Plan (RPTP). In particular, the short listed options will integrate with the concept of a layered network approach with an identified Rapid Transit Network (RTN) as the core spine. The Study will involve investigating the feasibility of the desired long term characteristics of the RTN through this part of the network, including optimal route, modes, and interchanges/hubs. The Study will also need to take account of the RPTP network plan reproduced overleaf.

The PT Plan 2011-2021 also refers to these aspirations. Public transport has an important role in supporting the regional form, design and function aspirations of the region. These aspirations are set out in Objective 12 of the Proposed Regional Policy Statement:

"To provide a compact, well designed and sustainable regional form that has an integrated, safe and responsive transport network."

The Proposed Regional Policy Statement builds on the Wellington Regional Strategy and Regional Land Transport Strategy. It identifies the critical link between urban development and transportation in creating a compact, well designed and sustainable regional form with public transport supporting more intensive development around public transport nodes and along key public transport corridors.

Urban development that occurs alongside existing public transport corridors will provide for more efficient use of that infrastructure and will reduce the need for new infrastructure at the margins of the urban area. This, in turn, means more efficient use of existing networks and infrastructure."

The Future Network PT Plan is illustrated in Figure 7 below.

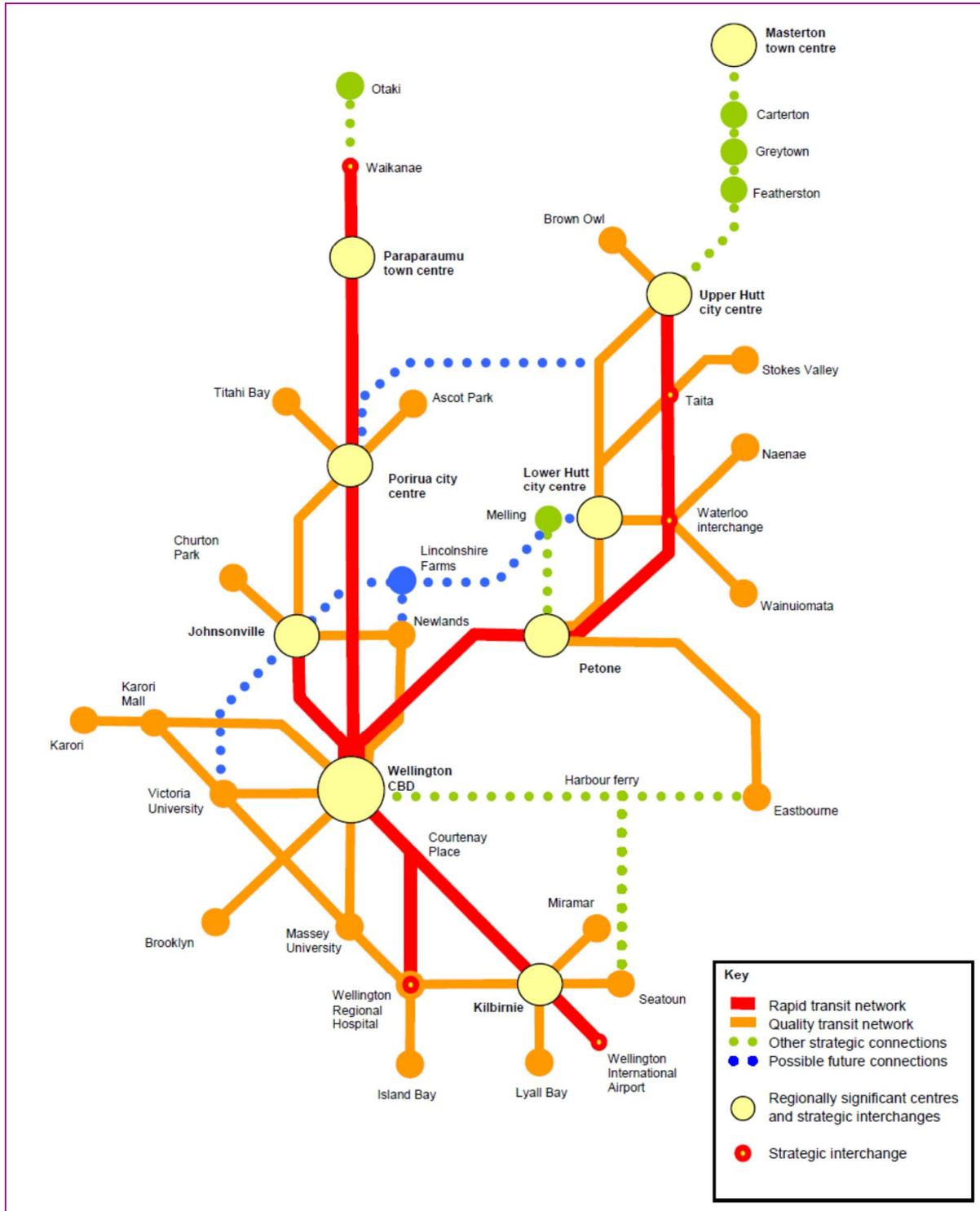


Figure 7 The Future Network Plan

Wellington City Bus Review 2011

The Study will take account of the findings of the Wellington City Bus Review (WCBR), currently being undertaken for Greater Wellington. Aspects of the WCBR that are expected to be adopted will be a key consideration in the definition of the Base Case. The study will also need to take account of a number of key regional projects that may affect travel patterns within the Study area. The Wellington RoNS will have a significant impact on the roading network. The timing of high quality PT system options will need to be considered in this context.

Land Transport Management Act 2003 and Government Policy Statement 2012

The study will be developed in the context of the Land Transport Management Act 2003 (LTMA) and the Government Policy Statement on Land Transport Funding (GPS) 2012. The LTMA requires that land transport proposals consider options and alternatives. The options will be assessed under NZTA's funding framework for Strategic Fit, Effectiveness and Efficiency.

The GPS sets out the Government's outcomes and priorities for the land transport sector. It describes:

- what the government expects to be achieved from its investment in land transport through the National Land Transport Fund;
- how it will achieve its desired outcomes through investment in certain areas known as activity classes (for example, the maintenance of State highways, road policing and walking and cycling);
- how much funding will be provided; and
- how the funding will be raised.

Regional Land Transport Strategies must take account of the GPS, and Regional Land Transport Programmes must be consistent with the GPS. This means the direction and aims of the GPS have a direct influence on the funding that is provided to regions and activities.

The GPS contains the following goals drawn from the National Infrastructure Plan that are directly relevant to the Study:

- to achieve a flexible and resilient transport system that offers greater accessibility and can respond to changing patterns in demand by maintaining and developing the capacity of the network. Improved operational management practice and the use of demand management tools especially in urban areas experiencing significant growth;
- to achieve a public transport system that is robust and effective and offers a range of user options that will attract a greater percentage of long term users; and
- to achieve a continued reduction in deaths and serious injuries that occur on the network

The following extract from the GPS is also relevant.

"Making quality investments in public transport

- Making quality investments in the area of public transport is also important. Providing public transport services and infrastructure can help manage road congestion and gives people alternatives to private car use. It can also play a significant part in linking people with employment.
- In addition, the New Zealand Energy Strategy 2011-2021 and the New Zealand Energy Efficiency and Conservation Strategy 2011-2016 highlight reliable and more cost effective public transport systems that offer benefits to attract a greater percentage of long-term users.
- There are opportunities in the main centres for public transport to make a stronger contribution to economic growth and productivity, primarily by relieving congestion and improving access to economic opportunities.
- There are also opportunities to improve the value from our public transport spend to ensure that growing sustainable public transport networks does not require increasing levels of subsidy."

Current Public Transport System

The current public transport system plays an essential role in the success of Wellington as evidenced by the relatively high mode share (17% of region wide trips in 2006 RLTS¹¹) that public transport enjoys. 36.6 million trips were made on public transport in 2010/11 (RPTP 2011). 17% of region wide trips to work are made by PT and the RLTS target is that this should rise to 21% by 2020. Wellington City residents make significantly greater use than other residents in the region, with 51% using PT at least once per week.¹² This compares with 25% average over NZ's largest 12 city areas. However the success of public transport in Wellington brings with it challenges both in the present and in the future. The RLTS target is that mode share will grow to 21%¹³ of all trips with an increase from 17 million peak period trips per annum in 2009/10 to 23 million per annum by 2020.

¹¹ Source: Wellington RLTS 2010-2040 (p31)

¹² Ian Wallis 2007 PT Usage and User Perceptions Overview – internal Greater Wellington document

¹³ Source: Wellington RLTS 2010-2040 (p31)

At peak times, current Metlink Bus Schedules (metlink.co.nz) show approximately 120 buses per hour in each direction are scheduled along the Golden Mile from the Railway Station to Courtenay Place. Bus queues form in Willis Street and buses often have to wait for two or more phases of the traffic lights to pass through the fifteen signalised intersections and pedestrian crossings. This can lead to frustration for bus users as well as delays for pedestrians wishing to cross safely at intersections. A number of buses run empty which can add to peak time bus congestion.

There have been safety issues associated with the high frequency of buses and the high number of pedestrians in the CBD which will need to be considered in any future upgrades to the public transport system. Further detail on accident numbers and locations are given in Figure 11: Road Transportation and Crashes. Since the introduction of the combined bus route along Manners Street in 2010 there have been a number of accidents involving pedestrians unfamiliar with the new layout. Safety audits and investigations into the cause of the accidents have been carried out and safety mitigation measures are currently being considered. A new pedestrian crossing has been proposed at Chews Lane to address pedestrian safety concerns at that location.

WCC has identified that the growth spine from Johnsonville to the Airport is critical to future economic growth within the city¹⁴. A key component of the Study is to compare how different public transport options will contribute to WCC's objective of strengthening WCC's urban growth spine. High quality public transport has been identified as an important factor in ensuring the growth spine can support and will attract the densities desired in the city's growth strategy.

Other references to the growth spine are given below:

The Wellington RLTS refers to "Wellington City Council's Growth Spine concept to encourage transit-oriented intensification of employment and housing along a key spine between Johnsonville and Wellington International Airport."

The Wellington Regional strategy notes "Transport outcomes identified in this Strategy will play a significant part in facilitating the growth sought by the WRS. For example, new transport corridors, such as the Grenada to Gracefield link road and Johnsonville to Airport growth spine, will be key drivers for economic growth by improving connectivity between economic centres."

The growth spine is consistent with the Proposed Regional Policy Statement regional form, design and function aspirations.

There is a wealth of information available in more than 55 documents that have been considered in compiling the Project Inception and Scoping Report. This information has been augmented by traffic modelling using the Wellington Transport strategy Model (WTSM), GIS mapping and meetings with Greater Wellington, WCC and the NZTA. This has aided in understanding the current situation and refining the method of approach to the Study (Section 3.0).

The Current Situation

This Section summarises the current land use, socio-economic, environmental and transport characteristics and how these characteristics may impact on the future growth and infrastructure planning for the public transport spine corridor.

The following maps are presented to support the text in this section.

- Figure 8: Land Use;
- Figure 9: Demographic and Socio-economic;
- Figure 10: Environmental Constraints;
- Figure 11: Road Transportation and Crashes;
- Figure 12: Public Transport; and
- Figure 13: Active Transport.

¹⁴ Source: Wellington Regional Strategy 2007 (p37)

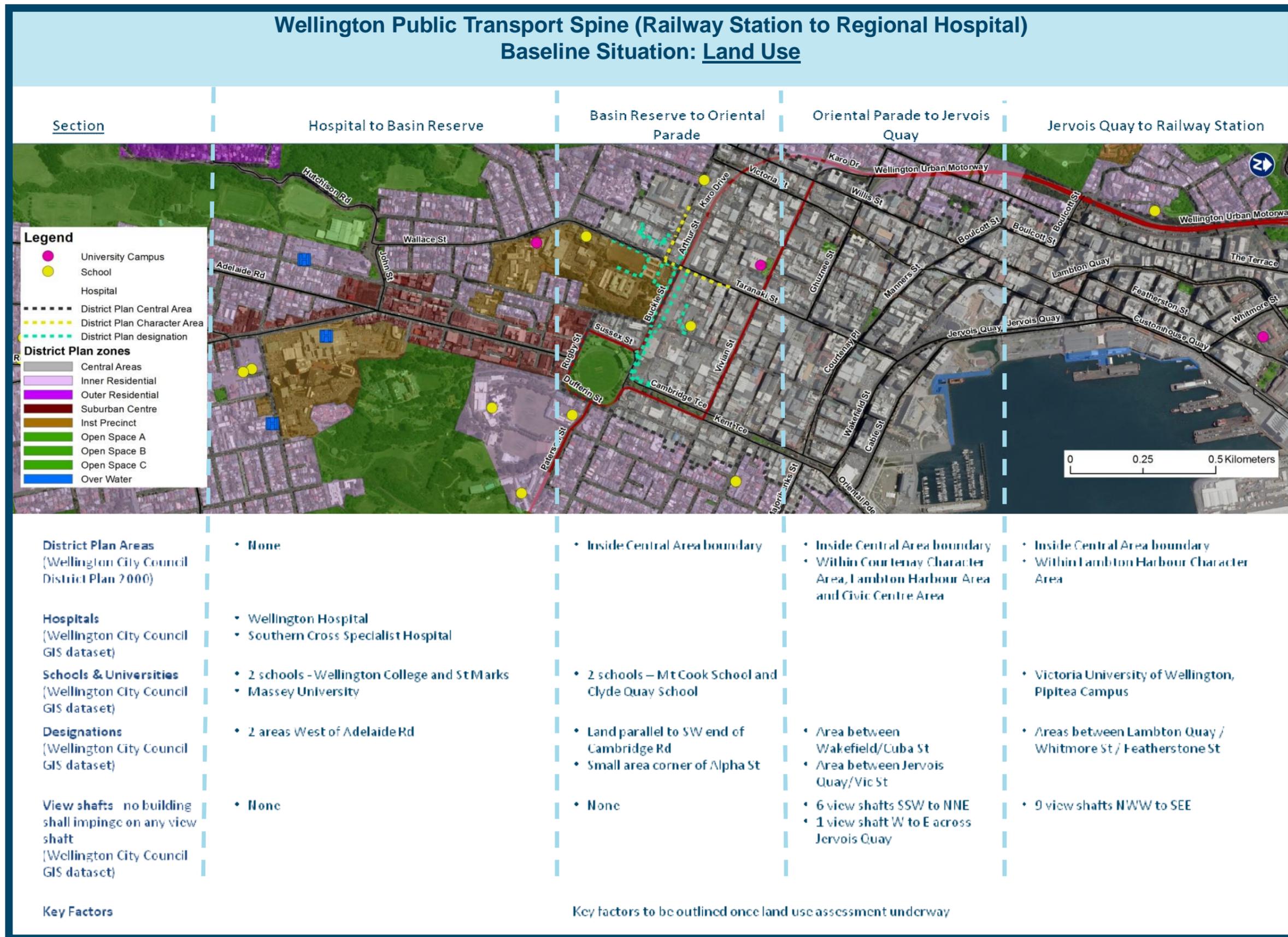


Figure 8 Existing Conditions, Land Use

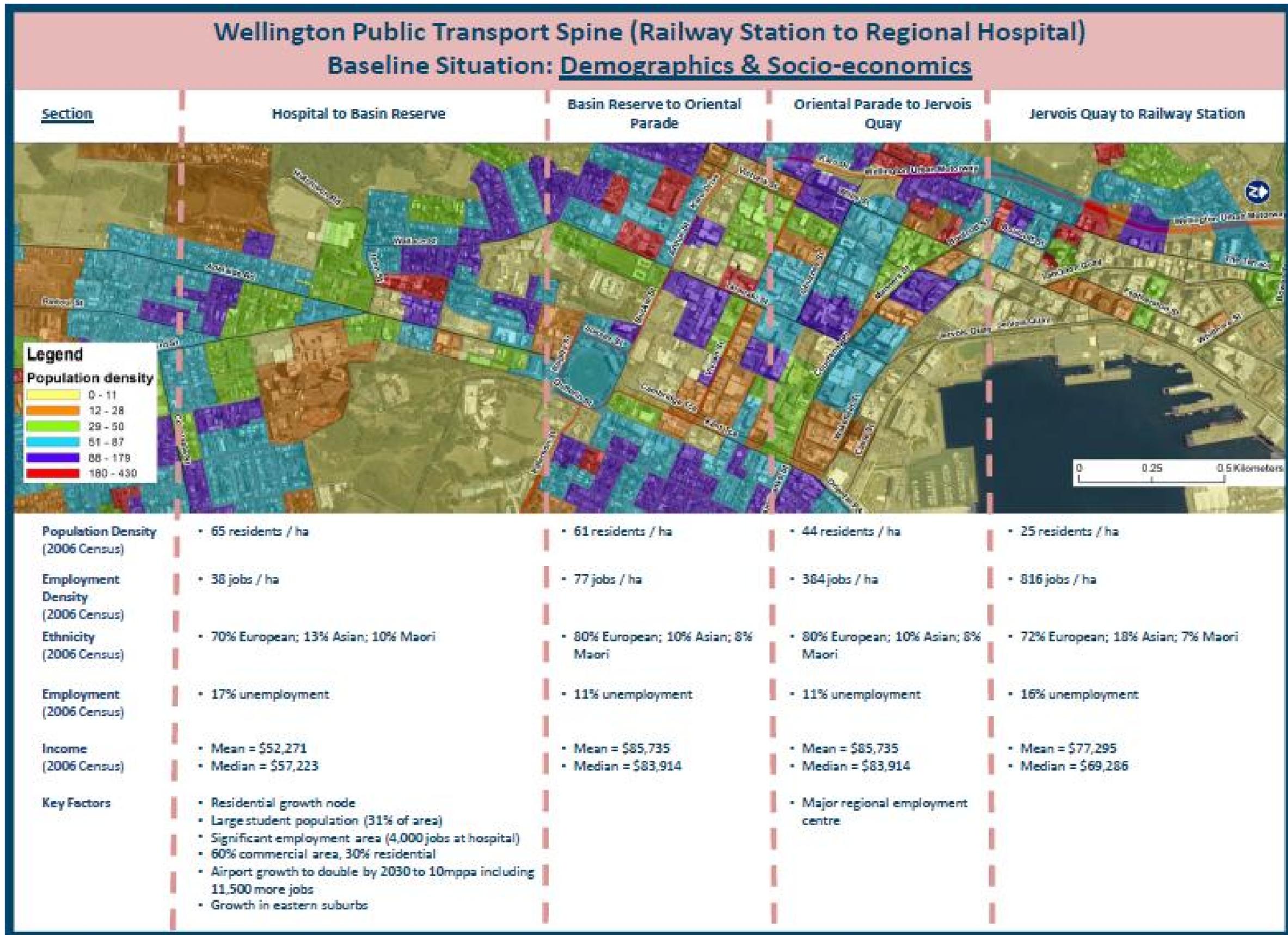


Figure 9 Existing Conditions, Demographic and socio-economic

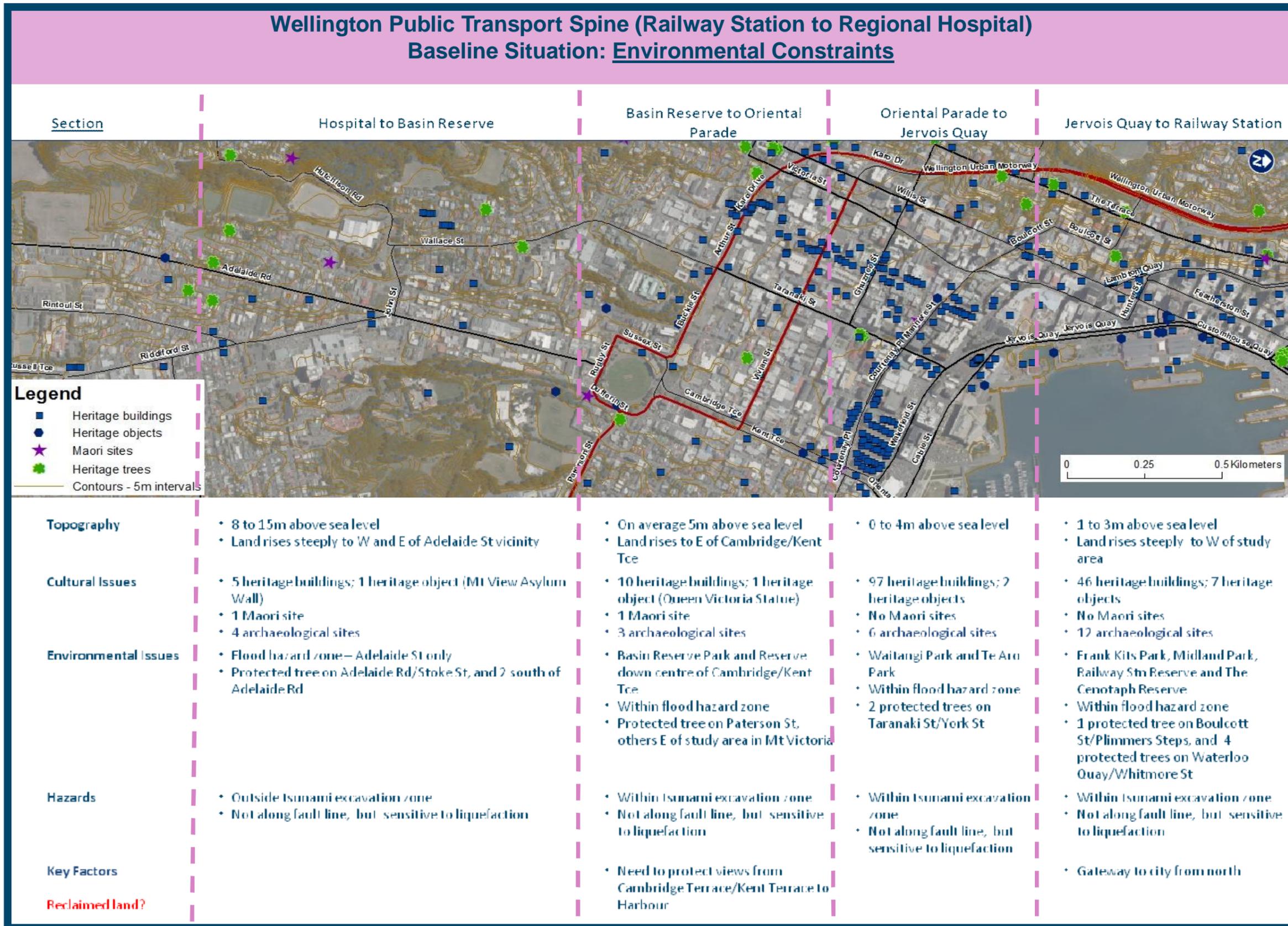


Figure 10 Existing Conditions, Environmental

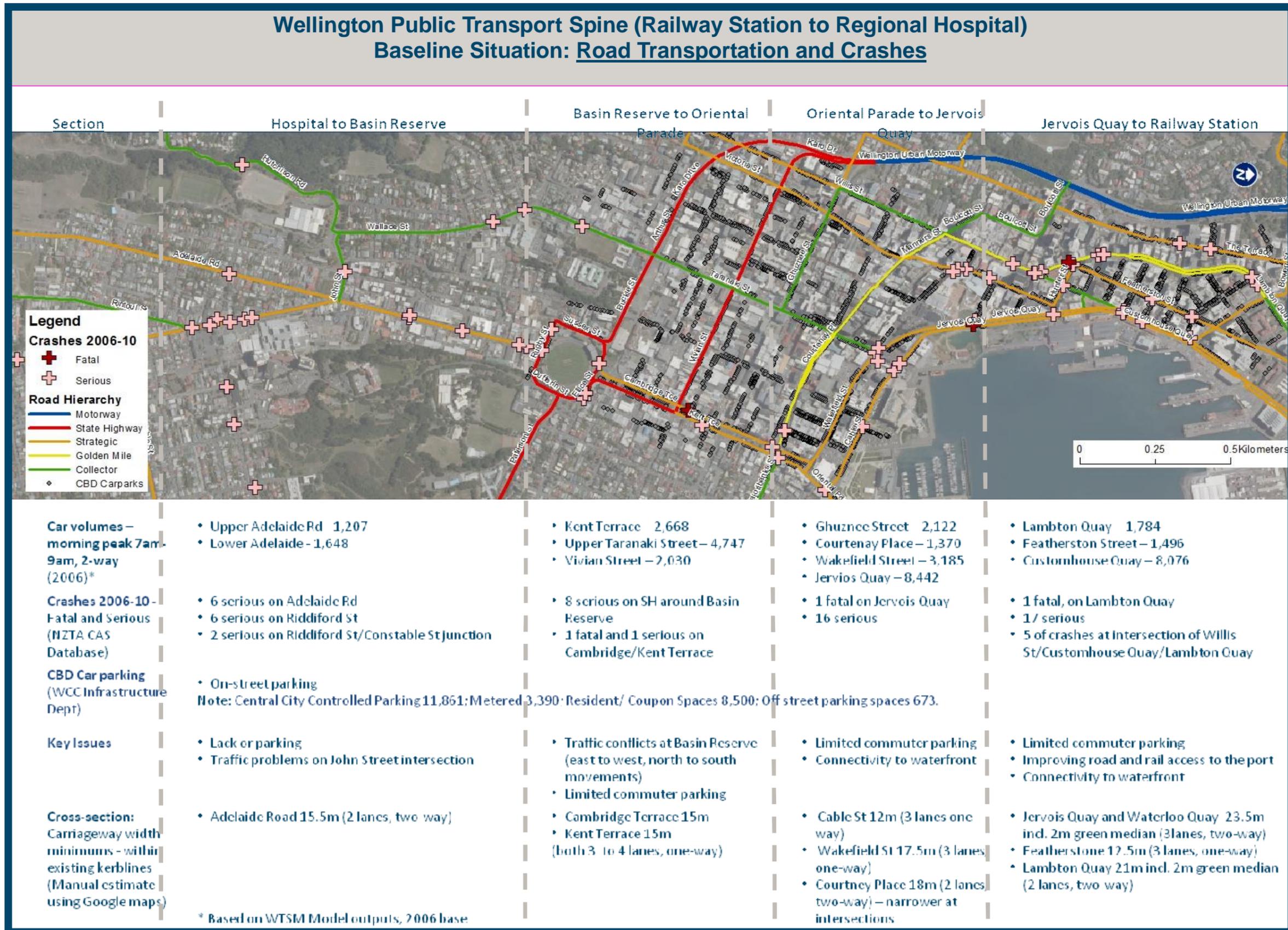


Figure 11 Existing Conditions, Transport

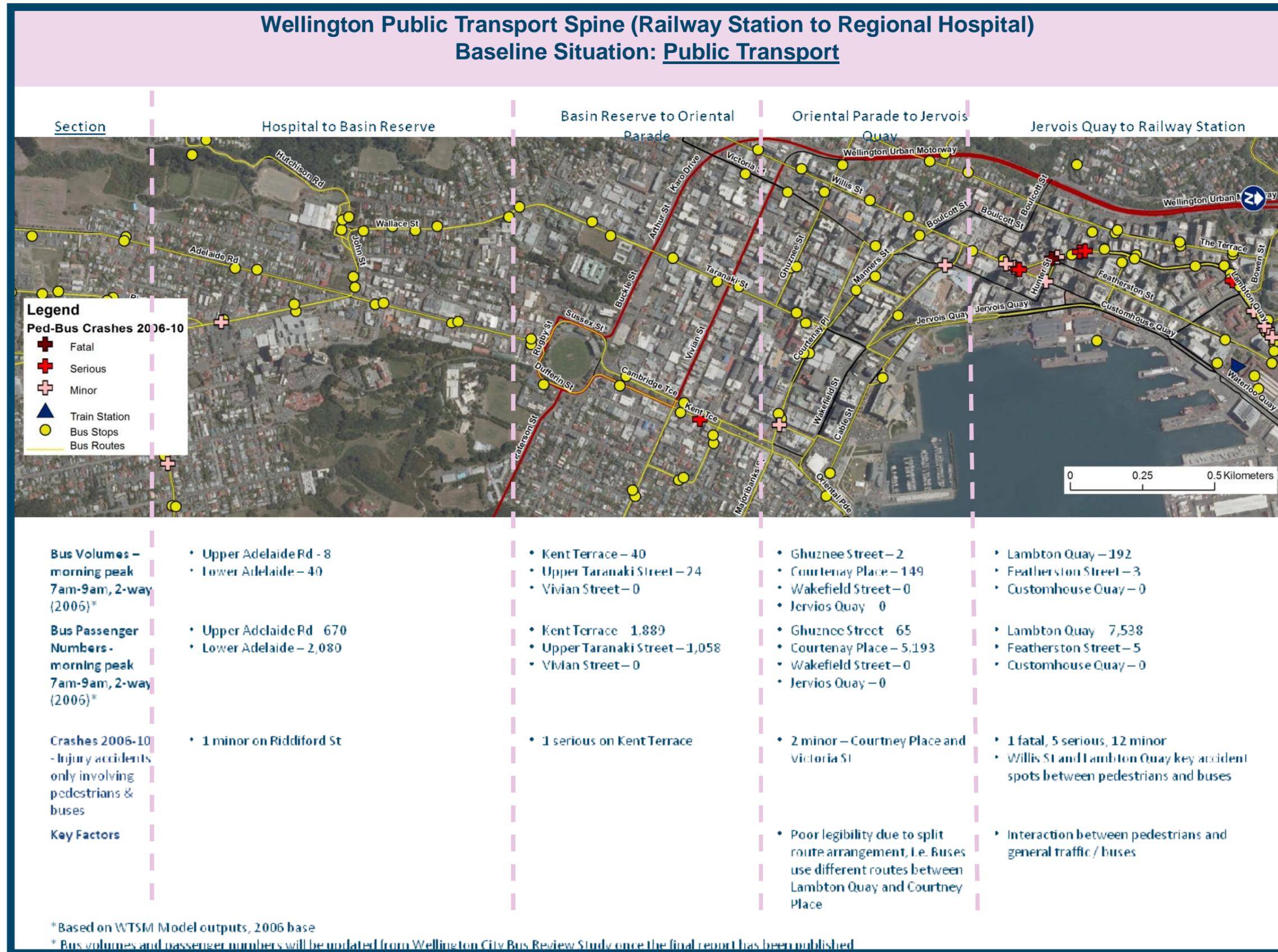


Figure 12 Existing Conditions, Public Transport

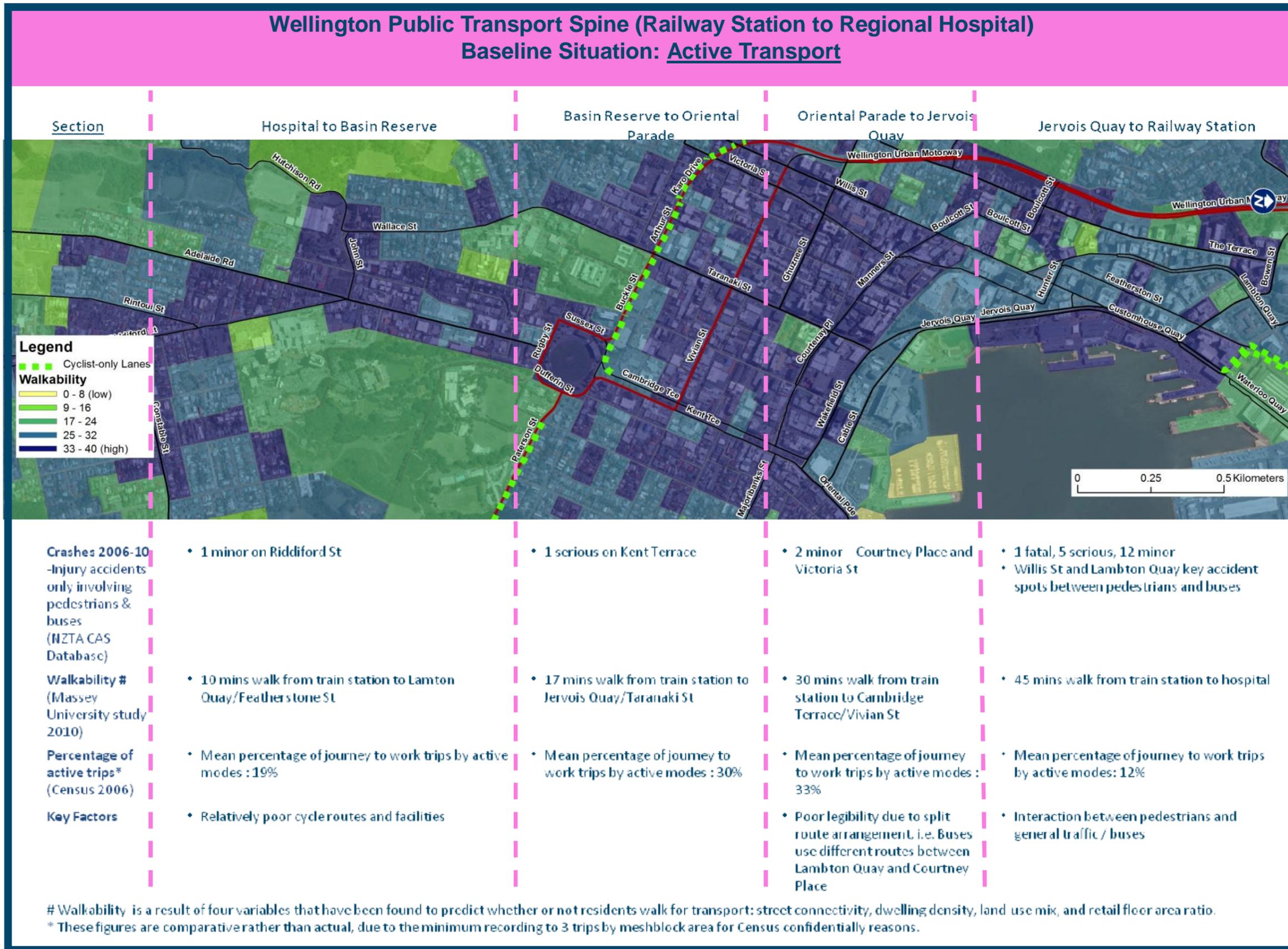


Figure 13 Existing Conditions: Active Transport

Appendix B

Extracts from Background Documents Used to Develop the Study Vision

Appendix B Extracts from Background Documents Used to Develop the Study Vision

Wellington Regional Strategy 2007

The 2007 Wellington Regional strategy sets out the vision for Wellington as follows:

In 2025 the Wellington region's competitive advantage will be based around its capital status, global links and local geography. The two main corridors running the length of the area will create a feeling of free movement and intimacy in the region. You'll never feel far from the bush, the sea, work or home. A thriving entrepreneurial spirit of new ideas will be encouraged and drive the economy. People will live in safe, clean communities that celebrate the coming together of different cultures. Everyone will enjoy access to sport and active leisure, environmentally friendly outdoors and to thriving, cosmopolitan arts and entertainment.

Proposed Regional Policy Statement 2009

"Integration of land use and transportation

A lack of integration between land use and the region's transportation network can create patterns of development that increase the need for travel, the length of journeys and reliance on private motor vehicles, resulting in:

- (a) increased emissions to air from a variety of pollutants, including greenhouse gases
- (b) increased use of energy and reliance on non-renewable resources
- (c) reduced opportunities for alternate means of travel (such as walking and cycling) and increased costs associated with upgrading roads
- (d) increased road congestion leading to restricted movement of goods and services to, from and within the region, and compromising the efficient operation of the transport network.

Objective 21

A compact, well designed and sustainable regional form that has an integrated, safe and responsive transport network that includes the following relevant to the PT Spine:

- (a) a viable and vibrant regional central business district in Wellington city;
- (b) an increased range and diversity of activities in and around the regionally significant centres²;
- (d) urban development in existing urban areas
- (h) integrated land use and transportation; and
- (j) efficient use of existing infrastructure (including transport network infrastructure)."

Regional Land Transport Strategy 2010-2040

The Strategy's vision is:

To deliver an integrated land transport network that supports the region's people and prosperity in a way that is economically, environmentally and socially sustainable.

The following detailed aspirations support this vision.

- The regional transport network will provide a high level of access, reliability and safety for both passengers and freight travelling within and through the region to support economic development and improve productivity.
- The regional transport network will be developed in a way which recognises the vital national role of Wellington as the capital city and the region's geographical position at the northern side of Cook Strait.
- Access to and between key destinations such as Wellington City CBD and other regional centres, CentrePort, Airport and Wellington Regional Hospital will be quick, easy, reliable and safe.
- Effective safety measures, behaviour change campaigns and other interventions will help to ensure that no one is killed or seriously injured when travelling within or through the region.
- In urban areas there will be viable alternatives to travel by private car for most trips.
- People will generally walk or cycle for short and medium length trips.
- Public transport will provide an excellent option for an increasing number of people, particularly at peak times along key commuter corridors. Public transport trip times and comfort will compete reliably and favourably with private cars for a majority of commuter trips.
- The public transport system will effectively connect people with key destinations.
- All public transport services will be fully accessible, including physical access, access to information and simple streamlined ticketing.
- People will need to travel less because they have access to excellent telecommunications, local job opportunities and live closer to their main destinations for work and play.
- More vehicles will run on renewable fuels that are non-polluting.
- People's travel choices will recognise the risk and impact of climate change and diminishing non-renewable resources.
- Traffic congestion will be managed at levels that balance the need for access against the ability to fully provide for peak demands due to community impacts and cost constraints.

Wellington Towards 2040: Smart Capital –the strategic vision for Wellington City

Wellington City Council's long term strategy "Towards 2040 : Smart Green Wellington" sets out its vision for a smart green city in the following diagram:



Vision: Toward 2040: A Smart Capital sees Wellington as a connected city, with easy access to regional, national and global networks. Connections will be physical, allowing for ease of movement of people and goods; virtual, in the form of world-class ICT infrastructure; and social, enabling people to connect with each other and their communities.

Goals for a connected city

- Supporting effective and efficient infrastructure: Understand our future infrastructure needs, continue to improve the city's public transport and pedestrian/cycling infrastructure and develop a sustainable funding model.
- City-to-city connections, nationally and internationally: A collaborative approach to inter-city relationships based on developing connections, rather than competing, and understand Wellington's unique role in national and international networks.
- City and regional connections that drive economic growth and innovation: An environment that encourages collaboration over competition, and industry strategies that identify the links between research, development, production, and commercialisation.
- International connections to support market access and knowledge exchange: Use Wellington's arts and events successes to increase our profile internationally, and work with our national institutions, embassies and consulates to connect to markets and knowledge.

Efficient Infrastructure

Formal and informal relationships at the city level are supported by the ease by which people can communicate with each other and physically move around. Wellington has good access to, and high use of, public transport. Ninety percent of the region's residents live within 400 metres of a bus stop or train station (about a five-minute walk). The city needs to continue to support and improve its public transport and pedestrian and cycling infrastructure as an efficient and sustainable way of connecting people with each other.

To ensure an effective and efficient infrastructure, Wellington will: Continue to improve the city's public transport and pedestrian/cycling infrastructure as a distinctive feature of Wellington, aligned with low-carbon goals.

Sustainable Urban Environment

Our transport infrastructure will be more sustainable with continued increases in public transport availability and quality, alongside walking and cycling alternatives.

Ngauranga to Airport Corridor Plan 2008

The Ngauranga to Airport corridor plan sets out its vision as follows:

The long term vision for this corridor described in the RLTS 2007-2016 is:

Along the Ngauranga to Wellington Airport Corridor, access to key destinations such as CentrePort, Wellington City CBD, Newtown Hospital and the International Airport will be efficient, reliable, quick and easy. Priority will be given to passenger transport through this corridor, particularly during the peak period. Passenger transport will provide a very high quality, reliable and safe service along the Wellington City growth spine and other key commuter routes. The road network will provide well for those trips which can not be made by alternative modes and will allow freight to move freely through the corridor. Traffic congestion through the corridor will be managed at levels that balance the need for access against the ability to fully provide for peak demands due to community impacts and cost constraints. Maximum use of the existing network will be achieved by removal of key bottlenecks on the road and rail networks.

Wellington Regional Public Transport Plan 2011 – 2021

The Regional Land Transport Strategy contains the vision for transport in Wellington:

To deliver an integrated land transport network that supports the region's people and prosperity in a way that is economically, environmentally and socially sustainable

Public transport specific:

- “Access to and between key destinations such as Wellington City Central Business District and other regional centres, CentrePort, Wellington International Airport and Wellington Regional Hospital will be quick, easy, reliable and safe.”
- “In urban areas there will be viable alternatives to travel by private car for most trips. People will generally walk or cycle for short and medium length trips. Pedestrian and cycling networks will be convenient, safe and pleasant to use.”
- “Public transport will provide an excellent option for an increasing number of people, particularly at peak times along key commuter corridors. Public transport trip times and comfort will compete reliably and favourably with private cars for a majority of commuter trips. The public transport system will effectively connect people with key destinations. All public transport services will be fully accessible, including physical access, access to information and simple streamlined ticketing.”
- “Traffic congestion will be managed at levels that balance the need for access against the ability to fully provide for peak demands due to community impacts and cost constraints.”

To achieve this vision and contribute to improved economic growth and productivity, we will also need to grow public transport patronage with less reliance on public subsidies.

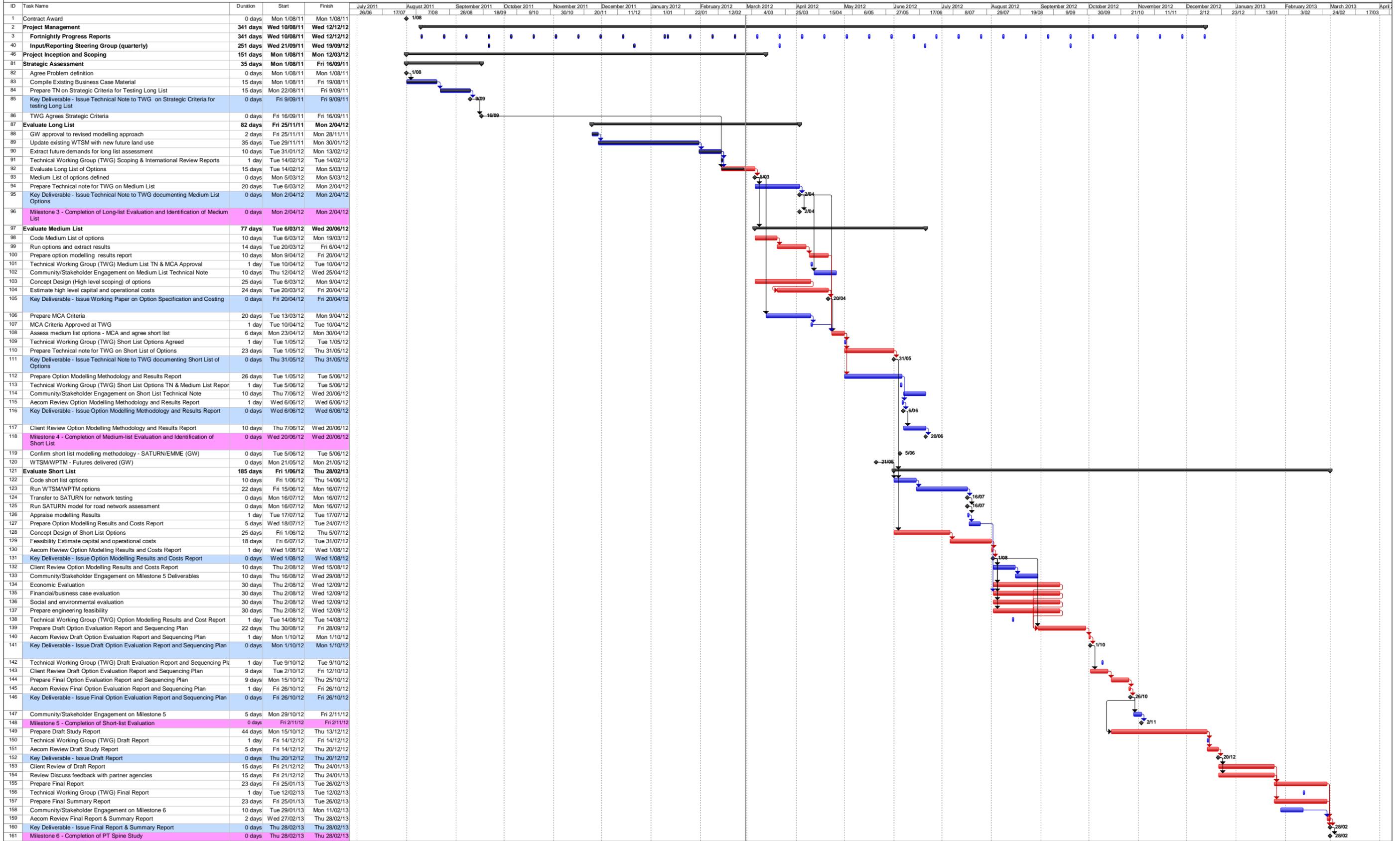
PT Leadership Forum vision, LTMA and GPS

Reference has also been made to the PT Leadership Forum vision, Land Transport Management Act 2004 and Government Policy Statement 2011.

Appendix C

Programme

Greater Wellington Regional Council Wellington Public Transport Spine Study



Appendix D

International Review List of Case Studies

Wellington Public Transport Spine Study



City	Country	Scheme type	Short Scheme Description	Similarity to Wellington Conditions
Karlsruhe	Germany	Tram	The "Karlsruhe Model" incorporates the seamless transition from an inner-city tram-trip to a regional train journey.	A relatively constrained narrow CBD with a strong public transport Spine; a suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
Freiburg	Germany	LRT	Investment in transport infrastructure in the city of Freiburg has resulted in a transformational impact on modal choice. The light rail system is the central component of the city's public transport network and makes up two thirds of the city's annual public	A relatively constrained narrow CBD with a strong public transport Spine
Bergen	Norway	LRT	Light-rail transit line between the centre of the city and the airport at Flesland (line 1)	A relatively constrained narrow CBD with a strong public transport Spine
Dublin	Ireland	LRT	Light Rail Transit (LRT) for Dublin city integrated with road traffic and often sharing space with other vehicles.	A suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
London	UK	PRT	Pod system at London's Heathrow Airport; this system now provides 900 passengers per day with a vital link from the T5 Business Car Park to the terminal	A bus based system with capacity problems, where improvements have been sought
Nantes	France	BRT	Combines the benefits of trams and buses with fully equipped, dedicated facilities built for the BusWay, which connects the centre of Nantes to Porte de Vertou. The two central lanes of a four lane, high-traffic road were converted into bus lanes	Discussed in the International Review
Lyon	France	MRT	The wider Lyon transport system is built up of the Metro, Tram, Trolleybus and Bus networks. These four pillars of public transport are integrated to create a comprehensive system that provides a greater range of services. All of these services are operated by TCL (Transport en Commun Lyonnais) allowing a single ticketing service across all four modes.	A suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
Rouen	France	BRT and LRT	Optically Guided Bus in Rouen. Designed to offer LRT quality at significantly lower cost. The LRT system comprises of a tram network of 18.2 km, including a 1.7 km section city centre route that runs underground, and 31 stops. The remainder of the network operates at street	A relatively constrained narrow CBD with a strong public transport Spine
Eindhoven	Netherlands	BRT	Advanced guided bus ('rubber tired alternative to tram') intended to deliver tram-like public transport at a very low cost. Recharging of the battery by means of electromagnetic induction; which means that the battery can be made much smaller, and thus less heavy and environmentally damaging. Concept has been exported to the French city of Douai.	Discussed in the International Review
Masdar City	United Arab Emirates	PRT	In this city, residents are expected to rely on public transport and personal rapid transit systems (PRT). The PRT system uses small pod-like vehicles to transport people from the	Discussed in the International Review
Seattle, WA	USA	Bus and LRT	The Seattle Bus Tunnel was completed in 1990, providing a high-capacity transit facility through the length of the downtown. The facility has four underground stations. The tunnel was renovated in 2007 to serve both light rail and buses, with LRT service beginning in 2009. The tunnel provides a direct connection to major rail station at south end of downtown.	A bus based system with capacity problems, where improvements have been sought; a relatively constrained narrow CBD with a strong public transport Spine
Denver, CO	USA	Bus	Denver's downtown transit strategy has two basic elements. The first was creating the 16th Street Mall, providing a strong and sustainable transit spine. The second was the incremental addition of light rail service to increase capacity, while maintaining the effectiveness of the core mall operation.	A bus based system with capacity problems, where improvements have been sought; a relatively constrained CBD with a strong public transport Spine; a suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.

Wellington Public Transport Spine Study



City	Country	Scheme type	Short Scheme Description	Similarity to Wellington Conditions
Portland, OR	USA	Bus and LRT	The initial phase of the Portland Transit Mall opened in 1978 for bus operations on two main streets in the downtown. The Mall was later extended and, in 2009, Portland Mall converted the mall into a bus and light rail mall, with a single continuous auto lane. The pavement and street furniture were upgraded and the mall now functions efficiently with bus and rail intermingled, but stopping at alternate blocks.	A bus based system with capacity problems, where improvements have been sought; a relatively constrained CBD with a strong public transport Spine
Cleveland, OH	USA	BRT	The Euclid Avenue Corridor is one of the oldest areas of Cleveland and an important transit street since the beginning of the 20th century. It remains a heavy transit corridor with peak-hour one-way bus volumes of 40 buses in the downtown area, but suffered economically in recent years. After unsuccessful efforts to develop a rail line, the city elected to develop a BRT line that opened in 2008. The BRT project dedicated two of four lanes to transit and developed a new streetscape for the entire corridor.	A bus based system with capacity problems, where improvements have been sought; a relatively constrained CBD with a strong public transport Spine
San Diego, CA	USA	LRT	San Diego's transit strategy has been based almost exclusively on the development of the San Diego Trolley (light rail) system. Over the past 30 years, the system has been incrementally expanded and is well utilized, carrying nearly 100,000 daily riders. The Bayside Line was constructed to provide a bypass line to help relieve demand on the initial downtown Trolley route.	A bus based system with capacity problems, where improvements have been sought; a relatively constrained CBD with a strong public transport Spine; a suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
Minneapolis, MN	USA	LRT	Opened in 2004, it is the first LRT line for the city, covering 19.2-kilometre. The Hiawatha Line connects several popular destinations, including downtown Minneapolis, Metrodome, Minneapolis/St. Paul International Airport, and Mall of America with a total of 19 stations. The light rail line operates with seven- to nine-minute headways during commute peak periods. Recent improvements have provided a successful new strategy for downtown bus service, similar to the Portland Mall.	A bus based system with capacity problems, where improvements have been sought; a suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
San Francisco, CA	USA	LRT	While San Francisco has multiple transit services, the extension of the Muni Metro (light rail) service to the Caltrain commuter rail station along the Embarcadero is particularly of interest. This recent project, opened in 1998, provides a direct connection to the rail station and also helped renovate the Embarcadero corridor after the 1989 earthquake.	A suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
West Virginia	USA	PRT	An extension to West Virginia University (WVU) in the 1960's resulted in the construction of a second campus 3km away from the original location. As a consequence WVU were forced to look at transport options to connect the two campuses. This led to the construction of the PRT system in the 1970's to cater to the needs of students	Discussed in the International Review
Vancouver, BC	Canada	Automated Rail Transit	Vancouver's SkyTrain, initiated in 1986, provides a high capacity, automated transit service for the downtown, which needs substantial transit capacity. The underground and elevated system avoided street conflicts, but is more costly than surface strategies. The recent Canada Line provides a new line connecting downtown with the airport.	A relatively constrained narrow CBD with a strong public transport Spine
Xiamen	China	BRT	A commuter railway station exists on the edge of the CBD, where commuters can transfer to a BRT system which uses an exclusive, elevated busway to take passengers into the CBD.	A bus based system with capacity problems, where improvements have been sought; a suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
Hong Kong	China	MTR/Tram	The CBD on Hong Kong Island is constrained by sea on one side and mountains on the other. There is both a mass transit railway (MTR) and a tram which services the strong PT spine.	Relatively constrained and/or narrow CBD with a strong PT Spine
Kagoshima	Japan	Tram	There are commuter railway stations on either end of Kagoshima's narrow CBD, which is constrained by a harbour on one side, and a strong tram spine	A suburban rail network (or metro) which terminates short of the central CBD requiring a change of mode to complete the journey

Wellington Public Transport Spine Study



City	Country	Scheme type	Short Scheme Description	Similarity to Wellington Conditions
Singapore	Singapore	MRT	There are currently six lines, the North South, East West and NorthEast lines, Bukit Panjang, Sengkang (East), and Sengkang (West). The long-term plan is to have 540 km of passenger railway by 2020 via the completion of planned or current new lines	A relatively constrained narrow CBD with a strong public transport Spine
Mumbai	India	Metro	Mumbai had major road capacity problems affecting bus performance in the city. They considered BRT, and the settled on a metro system, which is currently under construction.	A suburban rail line (metro) which stops short at one end of a CBD, which requires journeys to be undertaken by another mode.
Gold Coast	Australia	LRT	The Gold Coast Rail network does not run into the CBD. A light rail network is under construction in order to connect the suburban rail network to the CBD. The case study will explore the reasons and rationale of moving from a bus based system to LRT	A bus based system with capacity problems, where improvements have been sought.
Melbourne	Australia	Tram	Many workers commute to the office precinct on St Kilda Road by taking the train to Flinders St Station and then transferring on to the strong tram spine which runs from Swanston Street down St Kilda road to reach their destination.	Discussed in the International Review
Brisbane	Australia	BRT	The South East Busway is a dedicated bus rapid transit corridor which runs from Eight Mile Plains to Brisbane's CBD, a distance of 16.5 kilometres.	Discussed in the International Review
Adelaide	Australia	BRT	The O-Bahn sits somewhere between light rail and traditional bus services, operating buses along a 12km stretch of guided tracks. The O-Bahn connects the north-eastern suburbs of Adelaide to the city centre and terminates at its northern extent at the Westfield Tea Tree Plaza shopping centre.	A relatively constrained narrow CBD with a strong public transport Spine
Auckland	New Zealand	BRT	The Northern Busway opened in 2008 and is the country's first dedicated busway connecting the North Shore with the CBD. Built adjacent to State Highway One (SH1) it is a physically separated corridor.	A bus based system with capacity problems, where improvements have been sought.

Appendix E

Summary Table of Documents Reviewed

ID Number	Title/Details	Issued / Published	Relevance	Document Summary	Conclusions & Spine Study Inputs
1	Comprehensive Transportation Plan for Wellington NZ 1963	1963 Aug	TM	Recomends long range transportation improvements from 1963 onwards.	Background information with no inputs relevant to the Spine Study.
2	The Commuter, The Car and Metropolitan Wellington, Laurence Evans	1972	n/a	A 1970 case history of government decision-making in the face of transport innovation, urban growth and change.	Background information with no inputs directly relevant to the Spine Study.
3	Wellington Urban Motorway Concepts and Inception 1958-1960's	1975	n/a	Wellington urban motorway history of concepts and events that lead to construction of urban	Background information with no inputs relevant to the Spine Study.
4	Terrace Tunnel to Mount Victoria, R.W.Burrell	1980	TM	Investigates options for extending the urban motorway from Ghuznee Street to Mount Victoria.	Background information with no inputs directly relevant to the Spine Study.
5	Wellington-Johnsonville Railway Line, Cost Effectiveness Study, GWRC, 1984, B, C & Co, G, P & Partners	1984 Aug	BC	Provides the Wellington Regional Council with economic evidence and practical arguments for or against the retention of Johnsonville railway.	Additional costs to run buses over trains from Johnsonville into city, therefore recommends trains to remain. Discusses bus routes into the CBD.
6	Report of the Urban Rail Review Committee and Appendices, 1985	1985 Dec	BC	Describes operations and funding of NZ rail services, examines cost and revenue structure, efficiency and cost effectiveness of urban rail passenger services in 1985, prepared for MoT. Includes base case economic assumptions, comparison of bus/rail cost data, survey of users,	Recommends a range service and funding improvements. Largely out dated in early 1990s. Note it recommends to replace Johnsonville Line with buses.
7	Urban Rail Review Committee Report, Technical Appendix V1, 1985	1985 Dec	BC	Supporting information/analysis to operations and Funding of NZ rail services in 1985 report.	
8	Urban Rail Review Committee Report, Technical Appendix V2, 1985	1985 Dec	BC	Supporting information/analysis to operations and Funding of NZ rail services in 1985 report.	
9	Urban Rail Review Committee Report, Technical Appendix V3, 1985	1985 Dec	BC	Supporting information/analysis to operations and Funding of NZ rail services in 1985 report.	
10	Commentary on the Report of the Urban Rail Review Committee, 1986, McGregor Murray Allan & Co	1986 Feb	TM	Commentary on the urban rail review committee report focusing on the justification on different levels of subsidies. Discusses general subsidy issues, specific issues outdated.	Background information, specific conclusions outdated.
11	PT options Johnsonville-Wellington CBD Corridor, Technical Appendices, GWRC, 1993, Travers Morgan	1993 Aug	BC, IR, TM	Study of PT to northern suburbs focussing on rail corridor. Options considered were evaluated within a framework considering various impacts.	Recommends that GWRC determine a medium-term strategy for PT in this area. This was done with the North Wellington PT Study (2006).
12	PT options Johnsonville-Wellington CBD Corridor, Executive Summary, GWRC, 1993, Travers Morgan	1994 Aug	BC, IR, TM	Study of PT to northern suburbs focussing on rail corridor. Options considered were evaluated within a framework considering various impacts.	Recommends that GWRC determine a medium-term strategy for PT in this area. This was done with the North Wellington PT Study (2006).
13	PT options Johnsonville-Wellington CBD Corridor, Main Report, GWRC, 1993, Travers Morgan	1995 Aug	BC, IR, TM	Study of PT to northern suburbs focussing on rail corridor. Options considered were evaluated within a framework considering various impacts.	Recommends that GWRC determine a medium-term strategy for PT in this area. This was done with the North Wellington PT Study (2006).
14	Wellington City Bus Park and Ride Program, Draft Report, GWRC, 1994, Travers Morgan	1994 Aug	TM	Describes existing P+R identifies issues and evaluates alternatives.	Background information for consideration within Spine Study.
15	Park and Ride Program Development: Hutt Valley Corridor, 1994, GWRC, Travers Morgan	1994 sep	TM	Describes existing P+R identifies issues and evaluates alternatives.	Background information for consideration within Spine Study.
16	Park and Ride Program Development: Hutt Valley Corridor - Appraisal of existing Facilities and identification of issues and options (Draft 3), 1994, GWRC, Travers Morgan	1994 Sep	TM	Describes existing P+R identifies issues and evaluates alternatives.	Background information for consideration within Spine Study.
17	Park and Ride Program Development: Johnsonville, Paraparaumu, and Wairarapa Rail Lines, Wellington Bus Schemes, Inception Report, 1994, Travers Morgan	1994 Sep	TM	Describes existing P+R identifies issues and evaluates alternatives.	Background information for consideration within Spine Study.
18	Light Rail Transit Feasibility Study, Executive Summary, 1995, WCC, Works, MVA	1995 Jul	BC, TM	LRT options & corridors, Design & environmental considerations, BC including Do Minimum and consultation.	LRT could provide a number of significant economic, traffic, and environmental benefits to Wellington. Extending LRT into Wellington centre is worth while. Rotes identified included in long list options.
19	Light Rail Transit Feasibility Study, Working Papers Notes & Background Information WCC, GWRC, 1995	1996 Jul	BC, TM	LRT options & corridors, Design & environmental considerations, BC including Do Minimum and consultation.	LRT could provide a number of significant economic, traffic, and environmental benefits to Wellington. Extending LRT into Wellington centre is worth while. Rotes identified included in long list options.
20	Light Rail Transit Feasibility Study, Report, WCC, GWRC, 1995	1997 Jul	BC, TM	LRT options & corridors, Design & environmental considerations, BC including Do Minimum and consultation.	LRT could provide a number of significant economic, traffic, and environmental benefits to Wellington. Extending LRT into Wellington centre is worth while. Rotes identified included in long list options.
21	Wellington Rail and the Sustainable Vision - Putting US experience in a Kiwi Context 2003 Brent Efford	2003	IR	Discusses Wellington Rail in a global context.	Background reading for information.
22	Public Spaces and Public Life Study, GEHL Architects, 2004	2004 Oct	LU, TM	Study which identifies Wellington's use of public spaces in the central city. Identifies various planning information between Courtney place and railway station, including: LU, parking, pedestrian movements, walking links and road hierarchy.	The report makes a range recommendations for urban design future planning.
23	WCC Transport Strategy, 2006	2006 Jul	TM	The strategy sets out a map for the future development of Wellington City's transport system.	Identifies the need for seamless passenger transport system along the growth spine and bus priority on all main arterial routes and through the CBD.
24	Wellington City Urban Development Strategy, 2006	2006 Jul	LU	The strategy sets out the long term direction and priorities for urban development in line with the Regional Strategy.	Identifies key outcomes for the long term direction of urban development.
25	North Wellington Transport Study: Scenarios Report, GWRC, SKM	2006 Nov	BC, LU, TM	Summary current/future PT and land use in North Wellington and into the CBD. Identifies 4 future scenarios for a Johnsonville PT link into the CBD. Lists evaluation criteria for each of the PT scenarios and compares to base case.	Base case was minimum train improvements. No scenarios gained a BCR greater than 1, with conclusion that best economic performance would be the preferred scenario.
26	North Wellington Transport Study: Technical Evaluation Report, 2006, GWRC, SKM	2007 Nov	BC, LU, TM	Summary current/future PT and land use in North Wellington and into the CBD. Identifies 4 future scenarios for a Johnsonville PT link into the CBD. Lists evaluation criteria for each of the PT scenarios and compares to base case.	Base case was minimum train improvements. No scenarios gained a BCR greater than 1, with conclusion that best economic performance would be the preferred scenario.
27	North Wellington Transport Study: Scenarios Technical Appendices, 2006, GWRC, SKM	2008 Nov	BC, LU, TM	Summary current/future PT and land use in North Wellington and into the CBD. Identifies 4 future scenarios for a Johnsonville PT link into the CBD. Lists evaluation criteria for each of the PT scenarios and compares to base case.	Base case was minimum train improvements. No scenarios gained a BCR greater than 1, with conclusion that best economic performance would be the preferred scenario.
28	Ngauranga to Airport Strategic Study Technical Report 1: Description of Options	2007 Apr	BC, TM	Reviews previous studies and describes options. Provides descriptions of a range of transport options and sub options for the corridor. Reviews previous studies, identifies the current movements and mode share along the spine as well as growth predictions.	Identifies key issues for a range of transport options and considerations.
29	WCC Bus Priority Plan, 2007	2007 Apr	TM	Investigates and discusses how bus priority can improve mode share and traffic congestion.	Identifies proposed locations where bus priority can be used within the Spine Study corridor.
30	Ngauranga to Wellington Airport Corridor Consultation Document, GWRC, 2007	2007 Dec	TM	Ngauranga to Wellington Airport Corridor plan consultation document which outlines options/issues considered in Ngauranga to Airport study.	Refer to Ngauranga to Wellington Airport Corridor plan.
31	Ngauranga to Airport Strategic Study Technical Report 2: Option Packages	2007 Jul	BC, TM	Defines a range of transport options for the corridor. Identifies achievements and impacts of each option.	Identifies achievements and impacts of each option. Overall need for provision of a transport spine identified.
32	Wellington Regional Strategy, 2007	2007 Jun	n/a	Overview document; Wellington Regional Strategy identifies key focus areas to make Wellington "internationally competitive". Provides overview of opportunities that exist to lift the regions economic performance.	Provides overview of opportunities that exist to lift the regions economic performance.
33	WCC Parking Policy, 2007-2009	2007 Sep	TM	Describes the WCC parking policy for Wellington City's centres and how this is to be implemented.	Background information for consideration within Spine Study.
34	WCC Bus Priority Plan Update and Trialling Taxi Use of Bus Lanes, 2008	2008 Apr	TM	Details the one year trial that will allow taxis to use certain bus lanes.	Background information for consideration within Spine Study.
35	Ngauranga to Airport Stage 3 Consultation	2008 Aug	C	Final report on submission analysis of draft corridor plan.	Refer to Ngauranga to Wellington Airport Corridor plan. Lists concerns of all key stakeholders.
36	Wellington City Council Centres Policy, 2008	2008 Aug	LU, TM	Defines town centres, their roles and the Council objectives and policies. Identifies main objectives to give guidance to the development and management of Wellington City's centres.	Policy that gives context to the Spine Study.

37	Ngauranga to Wellington Airport Modelling, GWRC, 2008	2008 May	TM	Modelling report of individual road and PT schemes and packages for the Ngauranga to Airport study. Lists and defines modelled project assumptions.	Identifies the need to undertake the Wellington public Transport Spine Study and provides context.
38	Ngauranga to Airport Strategic Study Technical Report 3: Recommended Strategy	2008 May	BC, TM	Proposes solutions of previous options identified. Defines a range of transport options for the corridor. Explores how various options can be integrated into a transport solution.	Summarises proposed projects along the length of the corridor.
39	Johnsonville Town Centre Plan, WCC, 2008	2008 Nov	LU	Town Centre Plan for Johnsonville.	Plan that gives context to the Spine Study.
40	Adelaide Road - Planning for the future, WCC, 2008	2008 Nov	TM	Document identifies opportunities for future growth and development and outlines a long-term vision and key outcomes.	Identifies key uses of Adelaide Road and key future outcomes. Identifies possible future dedicated PT lanes.
41	Ngauranga to Wellington Airport Corridor Plan, GWRC, 2008	2008 Oct	BC, LU, TM	Ngauranga to Wellington Airport Corridor plan summary. Lists and defines improvement projects to be undertaken within the corridor in line with the RLTS.	Defines a number of packages for improvements to the transport network within the Ngauranga to Wellington Airport Corridor to be undertaken within 10 years; the spine study being one.
42	Strengthening and Restoring the Golden Mile - Bus Priority Report and Appendices, WCC, 2008	2008 Oct	TM	Reviews of the Golden Mile bus priority measures.	For consideration within Spine Study.
43	Wellington Regional Rail Plan, GWRC, 2010-2035	2009 Jul	BC, TM	Regional Rail Plan which provides for the long term development of the regions rail network. Identifies the current rail situation and identifies developed scenarios including base case (works completed to	Identifies several future develop scenarios. Each scenario has been evaluated with results defined.
44	Restoring the Golden Mile (Report 4), WCC, 2009	2009 Jun	TM	Describes themes/issues arising from public consultation of the Golden Mile restoration.	Background information for consideration within Spine Study.
45	WCC Central City Apartment Dwellers Survey Results, 2009	2009 Mar	LU	Central City Apartment Survey results.	Survey results give context to the Spine Study.
46	Central Area Bus Operational Review, OPUS, 2009	2009 Nov	BC, TM	Identifies options and recommends ways of improving bus efficiency and reliability through the Wellington Central Area. Identifies current operational constraints, bus stop locations, ticketing, forecast growth and route improvements.	Lists areas for improvement, bus patronage, travel times and operations. Identifies future population, land use and passenger numbers. Design criteria identified for Golden Mile.
47	WCC Kilbirnie Town Centre Revitalisation Plan, 2010	2010 Aug	LU	Town Centre Revitalisation Plan.	Plan that gives context to the Spine Study.
48	Wellington City Council Bus Lanes Monitoring Surveys, 2010	2010 Aug	TM	Describes bus lane surveys undertaken and analysis's results across several sites including before/after.	Survey evidence shows generally continued benefits are provided by bus lanes at the sites surveyed.
49	Wellington Bus Review - Initial Public Consultation Findings, GWRC, 2010	2010 Dec	C	Survey questions and results as part of an area wide PT service review. Not focused on the Spine	Background information for consideration within Spine Study.
50	The Master Plan, Wellington International Airport, 2010	2010 Jan	TM	The master plan looks ahead for the next 20 years and provides a view of potential development and investment opportunities.	Identifies a commitment to improving public transport access and transport links to and from the airport.
51	Wellington Regional Public Transport Plan 2010 - Discussion Document	2010 Mar	TM	Discussion document to facilitate feedback from stakeholders in order to prepare a PT Plan.	Refer to Wellington Regional Public Transport Plan 2010.
52	Manners Mall Bus Stops Evaluation Report, Opus, 2010	2010 Mar	TM	Evaluates the effect of moving the Dixon Street bus stop.	Background information for consideration within Spine Study.
53	Annual Monitoring Report on the Regional Land Transport Strategy - 2009-2010	2010 Oct	LU, TM	Reports progress in implementing the RLTS from a wide range of indicators including Passenger Transport and Land Use.	Little progress towards the RLTS passenger transport outcomes was made in 2009/2010. Perception of public transport has decreased over last few years. Limited measures are available to identify whether any improvement in the regions land use and transport integration has been made.
54	Wellington Regional Land Transport Strategy, 2010-2040	2010 Sep	BC, IR, TM	Specifies how GWRC plan to deliver an integrated land transport network in line with the LTMA and NZTS and GPS. Defines/lists objectives, regional pressures and issues to implement a regional transport network. Includes additional road safety, walking, cycling, TDM and freight plans.	Identifies objectives, regional pressures and issues to implement a regional transport network.
55	Wellington City Bus Review - Draft Report, GWRC, 2011	2011 Aug	BC, TM	Reviews existing conditions and context and identifies areas for improvement and focus such as travel time, transfers, ticketing and service options.	The bus review identifies many areas that need to be considered within the Spine Study, such as integrated ticketing, service goals, travel time and transport supply indicators.
56	Wellington Transport Models - Data Collection Sampling Methodology & Selected Routes - Memos	2011 Aug	TM	Discusses what bus surveys are to be undertaken as part of the modelling.	Background information for consideration within Spine Study.
57	Regional Land Transport Strategy Modelling Report, GWRC, 2011	2011 Jul	TM	Report detailing the modelling undertaken to inform the RLTS 2010-2041. Details influences on transport demand and details modelling work undertaken to understand what external influences affect transport system performance.	Identifies how future growth, car travel costs and land use density affects public transport trips, PT mode share and congestion and identifies strategic options summary.
58	Wellington Regional Public Transport Plan, 2011-2021	2011 Nov	BC, IR, TM	Specifies how GWRC will give effect to the public transport components of the RLTS. Defines/lists objectives and GWRC policy to implement the public transport components of the RLTS.	Defines/lists objectives and projects that are identified as being integral to delivering an integrated public transport network. Including future network plan and roles of a rapid and quality transit network.
59	WCC Toward 2040: Smart Green Wellington, 2011	2011 Jun	BC, LU,	Wellington City plan 2010 -2040.	Wellington city future plans that will be used as inputs into the Spine Study.
60	Wellington City Bus Review Focus Groups with the Publicm GWRC, 2011	2011 Jun	C	Focus group results as part of an area wide PT service review. Not focused on the Spine corridor.	Background information for consideration within Spine Study.
61	WCC Wellington 2040, Central City Framework, Spatial Structure Plan, 2011	2011 Jun	LU	Wellington City plan 2010 -2040.	Wellington city future plans that will be used as inputs into the Spine Study.
62	WCC Wellington 2040, City Centre Movement Infrastructure Analysis Report, 2011	2011 Jun	BC, LU,	Wellington City plan 2010 -2040.	Wellington city future plans that will be used as inputs into the Spine Study.
63	WCC Wellington 2040, How Green Infrastructure Could Unfold in the Future,2011	2011 Jun	BC, LU,	Wellington City plan 2010 -2040.	Wellington city future plans that will be used as inputs into the Spine Study.
64	Wellington Transport Models Draft Model Design Report, OPUS, 2011	2011 Sep	LU, TM	Describes WISW/WPTM model team approach. Models use common transit lines. Models will be update with current information, land use/employment changes. WPTM to have 780 zone structure. Will consider crowding, park and ride transfer trips. Light rail to be considered within a new assignment model	Bus/rail/vehicle surveys to be undertaken to cover patronage etc. Future year networks will be created for 2021, 2031 and 2041 and include projects agreed with GWRC.
65	Wider Economic Impacts of Transport Investments in New Zealand, NZTA, 2011 Research Report 448	2011 Sep	BC	NZTA research project aimed at developing a methodology for assessing the wider economic impacts of proposed transport projects.	Background information for consideration within Spine Study.

Key

BC	Business case
LU	Land Use
TM	Transport Mode
IR	International Review
C	Consultation