



Wellington Public Transport Spine Project

Alternative Funding Options Study

Final Report

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environments resources futures

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1 Introduction

1.1 Objective of the Project

The objective of this project is to examine the potential of alternative funding tools to fund or part-fund the options arising from the Greater Wellington Regional Council's (GWRC) Public Transport Spine Study (PTS for short).

An important aspect of the evaluation of infrastructure investments (as set out in the Better Business Case guidelines of central government) is that any project is fundable and affordable.

The outputs of this study will be considered alongside the final results of the PTS. This will enable decision-makers to make an informed decision about the affordability of each of the short-listed options as they seek to identify a preferred option.

The study is in the form of a “desk top” appraisal of possible funding tools, given current data and information. The research on alternative funding tools has been carried out at a feasibility level. It should be noted that this study does not consider the financing of the capital expenditure involved in the PTS options; that is how much may be sourced from public versus private funders, and the extent of any central government contributions (whether they be grants or loans).

This report has been prepared by Hill Young Cooper Ltd with the assistance of Douglas Economics.

1.2 Research scope

Key tasks have included:

- Identifying the potential range of funding tools
- Establishing evaluation criteria
- Determining, broadly, the likely quantum of funding that could be raised over a period of time
- Identifying any barriers and risks.

This project has involved the following steps:

1. inception and study setup
2. finalising the key evaluation criteria for the assessment of funding tools
3. literature review, including a review of the PTS outputs, and understanding the corridor conditions and wider catchments
4. assessment of funding options including estimating total quantum of funding

5. assessing funding methods against the criteria
6. engaging with key stakeholders on workability and acceptability of funding options
7. meetings and workshop with GWRC, WCC and NZTA.
8. preparation of draft and final reports.

Two working reports were prepared during the course of the project. The Stage One working report covered appropriate assessment criteria (step 2 above). The Stage Two report covered steps 3 and 4.

Douglas Economics prepared a separate report titled: Public Transport Spine Project Modelling Funding Options. This report undertook a financial evaluation of the options and modelled the ability of some of the selected funding methods, both individually and collectively, to provide the necessary level of funding.

This final report builds on these three earlier reports. In particular, it provides consideration of the funding options against the assessment criteria, along with the summary of the stakeholder interviews. This final report also addresses feedback provided from GRWC and NZTA on the previous reports.

Section 6 provides a summary of the report's analysis of the funding options.

1.3 Study Context

1.3.1 Overview of Wellington Public Transport Spine Study

The Public Transport Spine Study is a joint study led by Greater Wellington Regional Council in partnership with the New Zealand Transport Agency (NZTA) and the Wellington City Council (WCC). The purpose of the study is to assess the feasibility of options for a high frequency and high quality public transport system through central Wellington between the Wellington Railway Station and Newtown to the south and Kilbirnie to the south east (called the Public Transport Spine or PTS for short). AECOM were engaged to prepare the main reports for the PTS.

Three short listed options were investigated in the PTS study, in addition to the 'reference case' which essentially involves the current bus services. The three options are:

- Bus priority
- Bus rapid transit (BRT)
- Light rail transit (LRT)

Table 1 contains the estimates for capex as identified in the finalised AECOM reports, for these options.

Table 1: Capex (\$millions, 2012 dollars). Source: AECOM 2013¹

Description	Bus Priority	BRT	LRT
Wellington (Central) PT Spine	16	79.8	204.8
Newtown (Southern) PT Spine	5.9	29.4	52.6
Wellington (Constable St) PT Spine	7.6		
Kilbirnie (Eastern) PT Spine	14	25.5	37.6
General Allowances, including:			
• Depots			22.6
• Tunnels			316
• Power upgrade			45
• Vehicles		28	88
• Alterations to Real Time installations		5	5
• Design fees	5	4.8	9.6
Design and Contingencies (20%)	\$9.7	\$35	\$156.3
TOTAL	\$58m	\$207m	\$938m

The above figures include allowance for new vehicles, although under current arrangements for bus operations, these are provided by the bus operator with their costs recovered by fares and subsidies. The LRT vehicles may, or may not be owed by a public agency.

The actual quantum of funding for each option will depend on the finance rate, the start date for funding and the length of funding period. In particular, the longer the funding period the lower the annual amount that needs to be funded.

Douglas Economics prepared a financial evaluation of the options. Based on this evaluation, Table 2 presents the funding requirement with a twenty year funding period for BP and BRT and a forty year period for LRT (with funding commencing in the same year as construction starts).

¹ For exact details see AECOM (2013) Wellington Public Transport Spine Study, Option Evaluation Report, Appendix E: Option Cost Methodology. The description of works carried out in each Spine section include site preparation, traffic management and road alterations, utility diversions/new services, trackworks/power, stations/ticketing and fare collection systems, road/paving/landscaping.

Table 2: Forecast Funding Requirement

FUNDING IN NOMINAL PRICES & DISCOUNTED AT NOMINAL LENDING RATE

	BP	BRT	LRT
Funding Gap PV 2013 \$m	35.1	51.5	685.6
Start Year	2014	2019	2018
Funding Years	20	20	40
Funding amount per year \$m (2013)	2.7	5.0	47

The financial evaluation compared the discounted escalated capital cost of each option with the discounted escalated benefits from (a) operating cost savings, (b) ticket revenue gain from increased patronage, (c) NZTA funding subsidy and (d) residual value from the remaining value of the investment at the end of the evaluation period.

Assumptions in the evaluation of the funding gap included:

- Cost: Cost escalation was forecast to increase the capital costs of BP by 6% to \$62 million, BRT by 30% to \$268 million and LRT by 28% to 1,197 million.
- Opex gain: The AECOM study forecast a saving in operating costs for the BRT option. BP was forecast to cost the same to operate as the Reference Case with LRT costing slightly more.
- Revenue: The impact on public transport ticket revenue was based on the AECOM patronage forecasts which were provided for 2021, 2031 and 2041. The AM peak forecasts were multiplied by 1,250 to calculate annual patronage. An average fare of \$2.65 per trip was assumed (based on the GW Long Term Plan) which was assumed to increase over time with CPI.
- Subsidy: NZTA subsidy was assumed at \$1.85 per trip (2013) based on figures in the GWRC Long Term Plan and escalated with CPI.
- Asset Value: A residual value of capital assets at the end of the evaluation period was included as a project benefit. Thus for example, the \$300 million LRT tunnel was assigned a 100 year life.

With these assumptions, BP would require \$2.7 million in funding per year (in 2013 dollars) escalated at CPI over the 20 years. For BRT the funding amount would be \$5 million. LRT would require much larger funding amounting to \$47 million per year over the forty year period (also escalated at CPI).

To place the above annual repayment requirements in perspective, currently the GWRC collects a total of \$85.3m in rates (2011/12 Long Term Plan).

2 Alternative Funding Options

The consideration of alternative ways of funding public investments is receiving significant attention as traditional methods of funding transport infrastructure come under pressure from councils, community and business groups seeking to generally restrain increases in public spending. Alternative funding tools therefore look at ways of funding projects by spreading funding across a wider range of people/activities and/or by targeting funding more closely to those who benefit from the infrastructure project.

This section reviews current funding sources and discusses possible alternatives.

2.1 Current funding sources for public transport expenditure and the search for alternatives

Capital costs for public transport services in Wellington region are funded by a mix of rates and grants from central government. The GWRC's Long Term Plan 2012-2022 identifies \$351-\$429 million in capital projects relating to public transport (not including the PTS) for the period 2012 to 2022. The GWRC expect NZTA to contribute around 50% to the financing of this investment. The GWRC's contribution will be partly funded by debt.

The operational costs for public transport in Wellington are currently funded from three main sources:

- National Land Transport Fund: approximately 50%
- Wellington regional ratepayers: approximately 25%
- Farebox recovery (i.e. fares): approximately 25%.

GRWC identify a number of pressures affecting the provision of public transport in the region, including:

- Funding and affordability pressures
- Rail network development and reliability
- Changes to fares and ticketing systems
- Changes to how public transport services are procured.

In respect of funding and affordability pressures, the Council recognises that it is a challenge to maintain current service levels and to grow patronage while meeting the requirements of the Regional Land Transport Strategy. Specifically, *"the Government Policy Statement on Transport Funding provides for only limited annual increases in public transport service expenditure (targeted at new metro rail services in Wellington and Auckland) and reduced available funding*

*for annual public transport infrastructure expenditure.*² Given this, there is an expectation from the government that services will be delivered more efficiently, reducing reliance on public funding. At the same time, the Council is under pressure from individuals and groups to increase the frequency and coverage of public transport services, especially during the off-peak travel period.

Both the Government and GWRC have invested heavily in upgrading the Region's rail network over the past 5 years.³ The extent to which the government may commit to further major capital expenditure on this region's public transport network is uncertain.

2.2 Funding Alternatives

Alternative funding schemes typically look at more effective ways of charging for road use and land value increases arising from infrastructure investments as two ways of raising additional revenue.

For example, the direct and indirect benefits of public transport investments can be reflected in land values adjacent to public transport routes. Public transport services like BRT and LRT services tend to concentrate benefits in and around transport stops: shop rents may rise; more productive jobs may be sustained by lower transport costs, while houses may become more attractive to buy due to improved accessibility. As a result, land values rise.

The AECOM scoping report on overseas examples of BRT and LRT systems suggested that land values may be up to 25% higher close to public transport stops of LRT systems, compared to properties in the wider area. This increase in land values can be used to help fund the infrastructure.

It should be noted that the increased land values may not result in new or faster growth overall across the region; rather it may be associated with the relocation of growth. Nevertheless, the clustering that does occur can mean savings in terms of other infrastructure costs and possibly improved urban efficiencies that the entire region benefits from.

The other main area of interest in alternative funding is road pricing or similar charging systems that target vehicle travel during busy times. Other examples include car parking levies and petrol taxes. Here the purpose is to manage travel demands, as well as raise revenue for public transport and other transport investments that relieve congestion.

Table 3 outlines the options that have been selected for inclusion in this project. Many of the tools selected generally work within current legislative mandates and do not seek to widen revenue streams beyond what is normally accepted as a local authority funding tool. For example, a deliberate decision was made not to investigate sources like a payroll tax, a local consumption (GST-based) tax or a bed tax. These alternatives are used overseas, but in the New Zealand context are generally seen to 'double up' with central government revenue gathering tools.

² GWRC (2011) Wellington Regional Public Transport Plan 2011 – 2021

³ \$500 million joint funding package in 2007, followed by a further \$88 million from the Government in 2012.

Table 2: Alternative funding tools to be assessed in project

Funding Tool	Description
General and Targeted rates	<p>A form of tax based on the property value collected from property owners and provided to the local city or regional council to enable it to provide a range of local government services and activities. Rates can be a general rate or 'targeted'.</p> <p>GWRC already collects a 'general rate' to fund its activities. In addition it has identified some 'targeted rates'. Targeted rates help to recover the costs more directly from those who benefit from a particular service or infrastructure e.g. Westpac Trust Stadium, transport rates.</p> <p>Legislative mandate: Yes. Local Government (Rating) Act.</p>
Development Contributions	<p>Under the Local Government Act 2002, territorial local authorities can charge fees for the extra community and network infrastructure needed as a result of development projects. These fees, known as development contributions, are often imposed as part of residential developments, non-residential development, subdivisions, and on some changes of land use.</p> <p>The money collected from development contributions pays for the cost of public infrastructure that is needed to meet the additional demand from growth, including network infrastructure such as stormwater and transport, open space reserves and community facilities.</p> <p>Legislative mandate: Yes. Local Government Act 2002.</p>
Regional Fuel Tax	<p>Regional fuel tax is a tax levied on petrol and diesel at point of sale at the regional level. Such taxes are usually used to support specific capital investment on transport roading projects.</p> <p>An amendment to the Land Transport Management Act (given royal assent on 12 June 2013) has removed the legislative mandate that formally existed to enable the collection of regional fuel taxes in New Zealand. Despite this, GWRC wished to understand the potential for such a tool.</p> <p>Legislative mandate: No.</p>
Road pricing	<p>Road users pay a charge when they cross a cordon (such as around the CBD) or use part of the regional road network during peak periods.</p> <p>The charge can be set as a means of demand management (i.e. deterring travel into congested areas or on the network during times when congestion is experienced), or it can be set as a means of raising revenue such as an alternative to fuel exercise charges and road user charges.</p> <p>No legislative mandate. Toll roads are possible, but free alternative routes have to be available.</p>

Funding Tool	Description
Car parking levies/targeted rates on car parking facilities	<p>Charges could be applied to car parking in a defined area, such as in the CBD. This could be way of a specific charge on public car parking charges, through a targeted rate imposed on private car parking operators, or a per car park charge on all car parks.</p> <p>Car Park charges can be an indirect means by which road users can be charged for the congestion costs that they impose on other road users.</p> <p>Legislative mandate: Yes. Local Government Act 2002 and/or Local Government (Rating) Act.</p>
Value capture via financial charges/taxes	<p>A one off charge could be applied to property when public transport investments are made, based on the extent to which land values rise due to the investment.</p> <p>Alternatively, or in addition, the charge could be applied when land is rezoned, or resource consents granted for development that exceed development envelopes set out on the district plan.</p> <p>It is similar to the notion of Betterment under the Local Government Act, but is wider in its application in that it can consider both:</p> <ul style="list-style-type: none"> • the improvement to land value arising from the direct investment in transport infrastructure • the indirect benefit from accompanying land use rezoning that may increase development envelopes. <p>Currently, the Local Government Act allows for councils to charge betterment, but not a general land value uplift levy.</p> <p>Legislative mandate: No.</p>
Value capture via land ownership (e.g. land banking, air rights leases)	<p>Council purchases land along the corridor, such as around key stations and interchange points, or as part of corridor widening works. Additional land is purchased ahead of development and surplus land is sold post the investment.</p> <p>In respect of air space lease, the city council already issues encroachment licences for certain structures and small buildings that encroach onto public property (for a yearly rental). An air space lease might involve more extensive incursions into the air space (e.g. buildings over a footpath above the ground floor or buildings that traverse portions of the public network corridor).</p> <p>Legislative mandate: Yes. Local Government Act</p>
Farebox recovery	<p>This option would explore the extent to which fare box charges could be increased to help recover costs. Users should experience faster travel times and improved reliability where public transport has its own right-of-way.</p> <p>Legislative Mandate: Yes. Local Government Act</p>

2.3 Public Private Partnerships

Other options such as Private Public Partnerships (PPP) have not been included in the study because they are effectively tools to make public finances "go further", rather than funding tools in their own right. They are a procurement and financing approach within which a wider range of funding/revenue tools could sit.

A Public Private Partnership approach can reduce risks for public agencies of cost overruns during construction, and remove significant cash flow demands from public accounts during construction of major projects; while they also allow for a range of pay-as-you-go and debt funding tools to be used over the lifespan of the project. There may also be a greater incentive for the private operator to ensure planned services and infrastructure better meets user demands so as to increase revenue, compared to a traditional public service procurement model.

In the case of a public transport service which will not cover all of its costs from users, the PPP model does involve service payments from council / government and this creates a liability to make regular payments over the life of the project. An aspect of alternative funding tools that is relevant for PPPs is therefore the degree of certainty over the revenue stream flowing from the funding tool.

An example of a PPP is the Gold Coast Light Rail project. The Gold Coast light rail project is the first PPP undertaken in Australia following the height of the Global Financial Crisis. Upon confirmation of the project by the Queensland Government in 2009, expressions of interest were sought from the private sector to assist in the building and operations of the light rail system. After a competitive bid process, GoldLinQ were announced as the operator of the system in May 2011. On 6 May 2011 GoldLinQ signed an 18 year \$1 billion PPP contract for Stage One of the project to design, build, finance and operate the light rail.

All three levels of government have made an investment/equity of \$949 million to the project:

- Commonwealth Government - \$365 million
- Queensland Government - \$464 million
- Gold Coast City Council - \$120 million.

The GoldLinQ website⁴ states that Government funded early construction works will prepare the corridor for construction and includes road widening, the relocation of public utilities, accommodation works such as the reinstatement of driveways, fencing and car parks and the construction of a station shell at the Gold Coast University Hospital. These early works remove a number of risks from the PPP project for the private partner.

Under the Project Agreement, the operator franchisee has agreed to design, construct, manufacture, install and commission the light rail system for the State and operate and maintain the light rail system in return for monthly service payments. This arrangement provides the government funding parties with certainty over the funding stream required to sustain the project.

⁴ (<http://goldlinq.com.au/constructing-light-rail/funding-partners/>)

3 Public Transport investment, economic drivers and evaluation criteria

Funding sources and evaluation criteria need to reflect the likely benefits of the proposed investment in public transport infrastructure, as well as the context of the region within which the project is occurring. This is in terms of both legislative mandate, but also in terms of the wider political and community acceptability.

The following section provides a brief scan of the potential benefits of public transport investments and then outlines key economic drivers in the Wellington region in terms of population, employment and financial health, as a prelude to considering evaluation criteria.

In addition, Appendix Three provides an overview of the current land use and transport environment along the corridor served by the PTS options, relative to the region as a whole, and the likely changes to the corridor as a result of the implementation of the PTS. Having a high level understanding of the benefits from the project, both for transport users and land uses, enables a consideration of which funding tools are likely to be more appropriate.

3.1 Public Transport Investments Benefits

Public transport investments may involve the following benefits:

- Improved convenience for public transport users – better reliability, more frequent services and possibly being able to reduce the number of cars in a household
- Improved accessibility for non-drivers – reducing social isolation, improving access to education, work and health opportunities for elderly, youth and people with disabilities that prevent them from driving
- Improved public health – reducing health care costs from more walking associated with public transport users and reduced air pollution, as well as fewer accidents from fewer cars on the road
- Improved urban environments (i.e. better amenity) – making the city a more attractive place to work and live
- Reduced road congestion – benefits to road users including businesses
- Green house gas emission reductions – benefiting future generations
- Reduced road and car parking construction and maintenance costs – saving ratepayer and road user charges, as well as enabling more choices for private landowners as to how to use land (e.g. less need for valuable space being taken up by car parking).

In addition to these direct benefits are wider economic benefits that can arise from investments in transport (whether they are road or public transport). These benefits may include:

- Agglomeration of businesses and resulting higher productivity, reflected in higher wages and increased profits for businesses
- Improved access to labour and customers for businesses, increasing competition between firms, as well as improving efficiencies.

These benefits are not distributed evenly. Some people receive more of a benefit than others, while benefits also vary over space and time.

In terms of locational benefits:

- Regional benefits to an economy will flow from improved transport efficiencies overall and possible agglomeration benefits if the project assists with business intensification and clustering. These benefits could be captured in part by regional petrol taxes or regional rates, for example.
- Local benefits could come from businesses and activities along the route having reduced transport costs and increased access to customers and a larger labour shed. This could be reflected in higher land values, and over time, more intensive development. These could be captured by way of targeted rates, land value uplift taxes and the like.

These benefits vary between passenger transport modes. For example light rail-based systems tend to see land use benefits clumped around stations (i.e. within 800m), whereas bus systems tend to see land use benefits more widely (and therefore thinly) spread across suburbs.

In terms of who benefits, potential beneficiaries can be broken down into the following groups:

- Public transport users
- Motorists
- Taxpayers
- Landowners
- Businesses
- Residents.

In the case of the Wellington PTS, benefits are concentrated in the area of public transport users. Highway users (other road users) see disbenefits. Table 3 sets out results from the economic evaluation of the PTS options undertaken by AECOM, presented in net present value, using a 30 year time period and an 8% discount rate.

Table 3: Summary of Benefits: NPV \$m

Assessment	Bus priority	BRT	LRT
Public transport user benefits	\$34.7m	\$95.5m	\$56.0m
Highway (dis) benefits	-\$18.2m	-\$23.6m	-\$31.6m
Wider economic benefits	\$4.1m	\$18.0m	\$6.1m
PV Benefits	\$20.6m	\$89.9m	\$30.5m

These benefits are less than the costs of the schemes, particularly for LRT. Table 4 sets out the costs.

Table 4: Summary of costs

Assessment	Bus priority	BRT	LRT
Capital and operating costs	\$46.4m	\$126.6m	\$679.6m
Car parking costs saved	-\$10.2m	-\$22.7m	-\$8.4m
PV costs	\$36.2m	\$103.9m	\$671.2m

Benefit to cost ratios are in the order of 0.05 for the LRT option (i.e. for every dollar spent, there is a 5 cent benefit). For the BRT, BCR ratios are 0.87 to 1.5. This suggests that for the BRT option there is more of an argument that those who benefit should contribute, but for the LRT option, funding is likely to have been mostly sourced from a regional or national level, as beneficiaries cannot be expected to cope with the very high costs relative to benefits.

For all of the cases, 25% of the benefits are assumed to derive from the wider economic benefits (e.g. improved business agglomeration), and as a result, these benefits will be experienced by businesses and landowners in the CBD, as well as households generally in the region if the scheme leads to enhanced productivity for the labour force, and as a result, improved salaries and wages. However, from the perspective of the regional economy, as the overall benefit/cost ratios are negative, any benefits get off-set by increased charges / taxes needed to cover the cost of the project, should it proceed.

For public transport user benefits, the 30 year NPV benefit of \$95m for BRT equals around \$8.5m per year in 2013 dollars, or about \$110 per rateable property in Wellington City, if Wellington City is assumed to see most of the benefits of this PTS option.

3.2 Public Acceptability

Balanced with consideration of benefits, is the public acceptability of funding sources. Funding of infrastructure from public sources is not “open ended” and most public funding involves a trade off between competing outcomes. At one level, public funding implies less money in people’s, households and businesses pockets - money that might be spent on activities that, overall, generate a greater economic return. At another level, public money could be spent on other public goods, like better education (central government) or more open spaces (council).

Public acceptability often comes down to whether an additional charge is reasonable. Is it affordable? During times of economic expansion, with growth and rising incomes and profits, new funding sources are likely to be more acceptable than during times of slow or no growth and static household and business incomes.

In considering the likely degree of public acceptability for funding future additional public transport investments in Wellington, it is useful to consider the population and economic climate in Wellington City and the wider region.

The region currently experiences modest levels of growth. The following table shows population growth, as estimated by Statistics New Zealand over the period 2006 to 2012, for the region and Wellington City.

Table 5: Resident population

Area	2006	2012	Change	% Change, 2006-12
Wellington City	187,700	202,200	14,500	7.7%
Wellington Region	466,300	490,100	23,800	5.1%
Wellington City as proportion of Region	40%	41%	60%	

Wellington City is growing faster than the region as a whole, but the growth rate is not large.

By 2031, Statistics New Zealand population projections (Subnational population projections assumptions, 2006 –2031 October 2012 update) place the region's population at 539,700. Wellington city's population will be 237,600 under a medium growth scenario, or an increase of 35,000. Wellington city's own projections estimate a population of 230,614⁵ by 2031.

In other words, in terms of a 2031 time horizon, growth will increase the size of the region's population by about 10%. In terms of the beneficiaries of transport investments, the current population will be the largest recipient. In addition, the city and region cannot "bank" on a large future population to help fund substantial infrastructure investments.

Turning to employment, employment figures collected by Statistics New Zealand indicate the impact of the global financial crises and the resulting slowdown in growth experienced since 2006.

Table 6: Employment in Wellington Region

	2001	2006	2012	Change 2001 to 2012	% Change
Wellington Region – number of people employed	209,050	233,420	235,460	26,410	12.5%

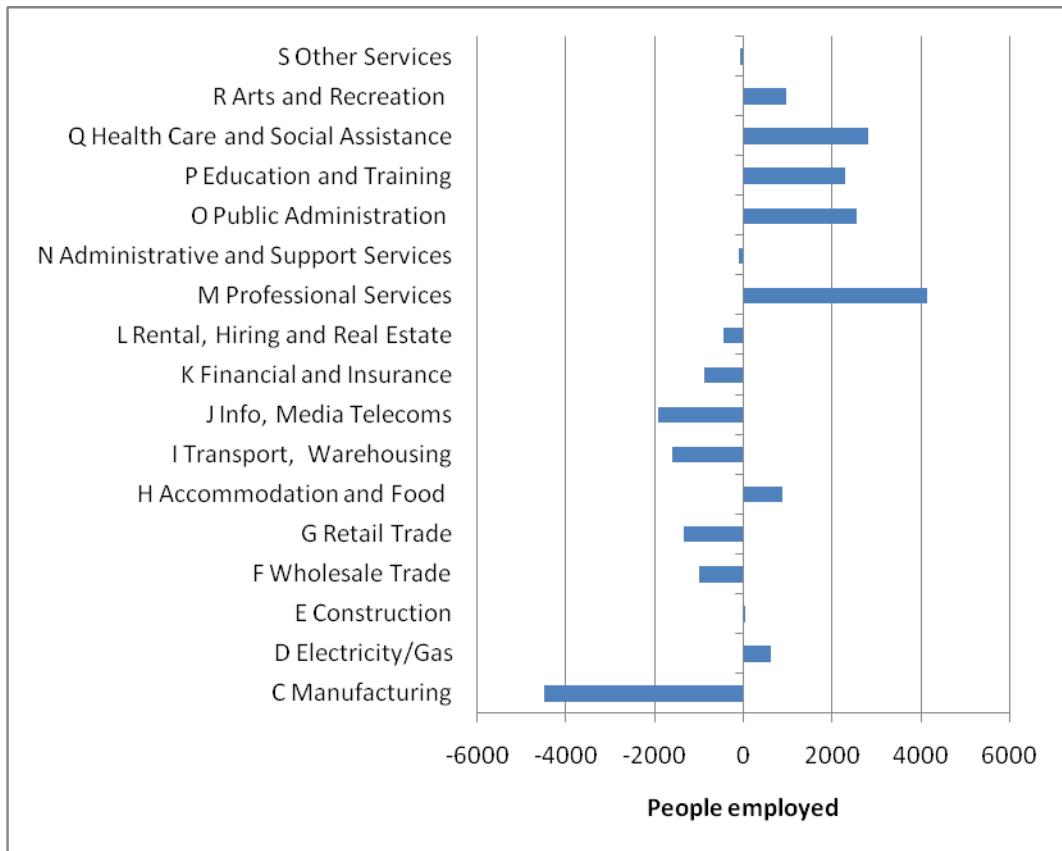
Most of the growth in employment between 2001 and 2012 occurred between 2001 and 2006. Since 2006, growth has been much slower. Slower economic growth raises issues of greater resistance to business costs increases (such as car parking charges), while it reduces the extent to which transport investments may generate desirable land use changes.

In terms of the location of that employment growth, a substantial proportion occurred in the CBD and the area immediately to the north. Some growth did occur in the corridors that will be directly affected by the PTS options. Overall Wellington City's share of regional employment has increased from 58% in 2001 to almost 60% in 2012.

In terms of the sectors that have grown since 2006, Figure 1 shows the change in the number of people employed by ANZSIC category, for the region. A substantial number of jobs were added in the professional and technical services, the public sector, as well as the other service sectors. These sectors are employment sectors that are particularly likely to benefit from improved public transport services.

⁵ Forecast i.d (2011).

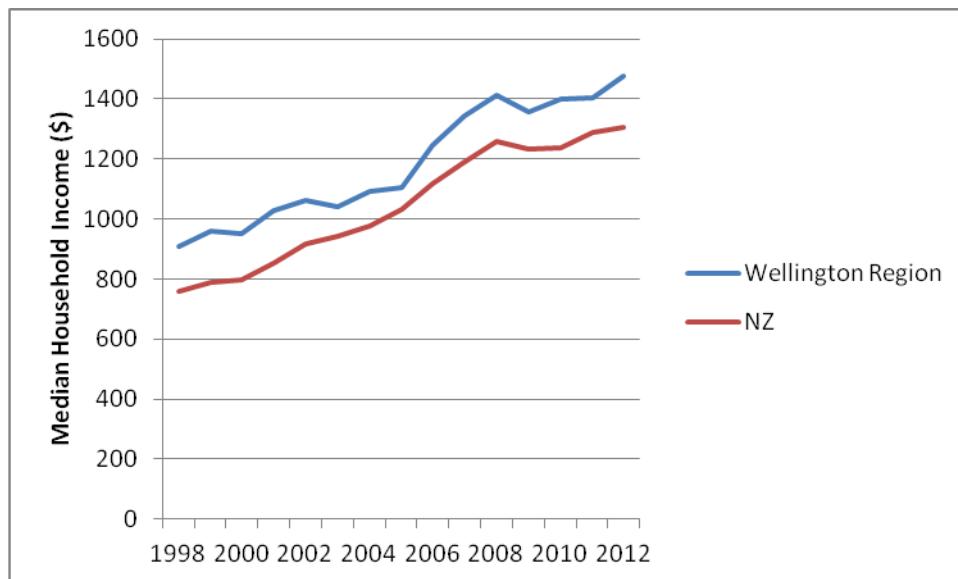
Figure 1: Change in Employment by Industry sector 2006 - 2012



As a result of these changes in employment composition, regional GDP per capita has increased with Statistics New Zealand recording a 10% growth in per capita GDP between 2007 and 2010, compared to a national increase of 7%.

Turning to households, median weekly household incomes in the Wellington region as recorded by Statistics New Zealand are higher than the national median. After a dip in 2008/2009, incomes have started to rise again (see Figure 2).

Figure 2: Median weekly household income: Wellington Region



It should be noted that the median income figures hide much variability at the local level.

In terms of transport costs paid by households, households in the Wellington region expend a bit more than households in other metro centres - \$152 per week in Wellington as opposed to \$148 in Auckland, in 2010 (see Figure 3). As a percentage of total household expenditure, Statistics New Zealand Household Economic Statistics show Wellington region households spend 12% of their normal household weekly expenditure on transport, compared to 13% for the nation as a whole. This is due to the higher median incomes.

The increase in household expenditure on transport in the Wellington region between 2007 and 2010 shown in Figure 3 can be broken down into three sub components, as recorded by Statistics New Zealand (see Table 7). Passenger transport services costs have increased as well as private transport costs.

Figure 3: Weekly spending on transport 2007 and 2010, by Region.



Table 7: Weekly household expenditure on transport - Wellington Region

Item	2007	2010	Change
Purchase of vehicles	\$41.4	\$41	\$-0.4
Private transport supplies and services	\$59.9	\$69.8	\$9.9
Passenger transport services	\$29.5	\$41.1	\$11.6
Total	\$130.8	\$151.9	\$21.1

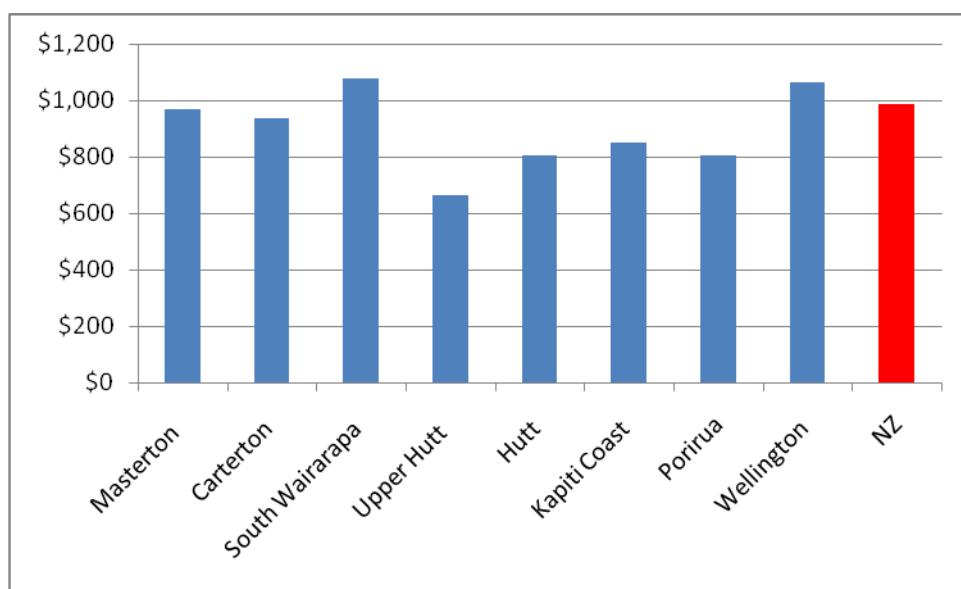
In comparison, Auckland households spent \$27 a week on public transport, but a similar amount on private transport (\$71) per week, in 2010.

The higher incidence of public transport related costs in Wellington suggest some potential resistance to increased transport related charges. On the other hand, the lower percentage of total household expenditure on transport suggests that there is some room for “movement” (provided that some other area of household expenditure is able to be reduced). The other possible method of funding within current spending envelopes is to look at tools that shift spending within the transport category, such as less spending on private transport leaving more money for public transport (for example households being able to get by with one car rather than two).

3.2.1 Rates burden

The cities and districts in the Wellington region gain most of their income from rates (around 60 to 70%). Wellington city has a relatively high level of rates income per capita reflecting in part the large commercial base in Wellington, compared to the number of residents.

Figure 4: Rates take per capita, 2011, Wellington region cities and districts



Household Economic Survey data for 2007 and 2010 shows weekly expenditure by households in the Wellington region on rates and related expenditure being similar to Auckland, but more than Canterbury (see Figure 5).

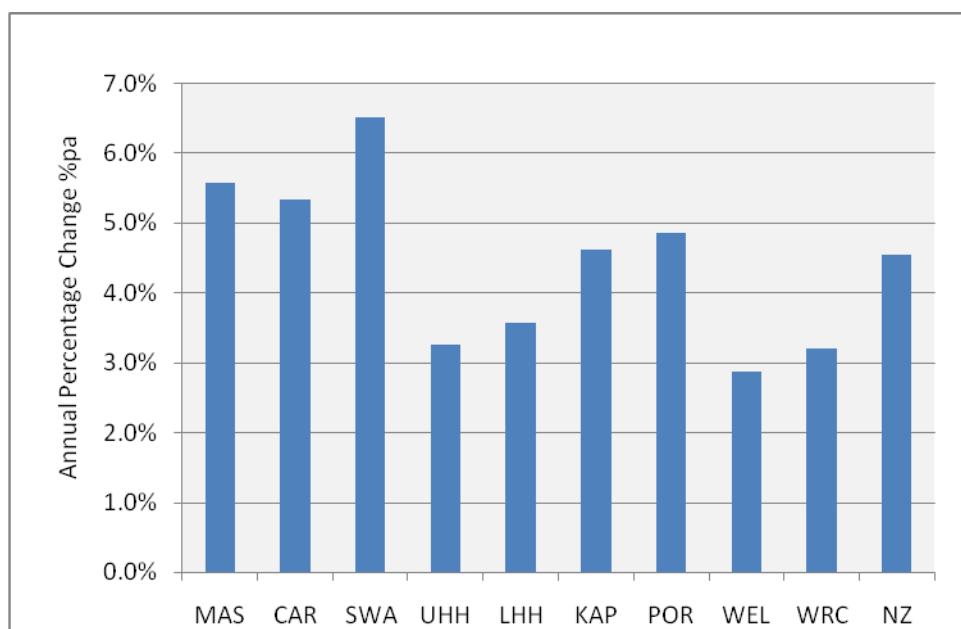
Across New Zealand as a whole, in 2010, households reporting expenditure on rates (i.e. not households renting properties) saw 2.7% of their weekly expenditure go on rates. If the same percentage applied in the Wellington region (where the figure in 2010 was 2.3%), then households would spend an additional \$220 a year on rates.

Figure 5: Weekly household expenditure on rates and related services, by region, 2007 and 2010.



While the incidence of rates may be small relative to overall household budgets, rates have been increasing faster than the CPI for some cities and districts in the region. Wellington city and Wellington region have recorded annual average increases below the national average (see Figure 6).

Figure 6: Annual average increase in rates, 1993 to 2011



MAS = Masterton District; CAR = Carterton District ; SWA = South Wairarapa; UHH = Upper Hutt; LHH = Hutt City; KAP = Kapiti Coast District; WEL = Wellington City; WRC = Wellington Region.

The slower economic growth experienced over the past 5 years is impacting upon the ability of councils to fund infrastructure, as well as other costs pressures. As noted in the GWRC's 2011 Long Term Plan:

In preparing this plan over the past year, we have taken into account the tough domestic and international economic environment. The global financial outlook is certainly not great at present and here in New Zealand we have the added impact of the Canterbury earthquakes. With this comes a significant increase in insurance costs. Also with the earthquakes we have a heightened awareness of the need to future-proof our own regional infrastructure. We are also acutely aware of the community's need for us to keep rates increases to a minimum. Over the life of this 10-year plan we have committed to maintaining an average increase in the cost of existing services to within the rate of inflation.

The council's financial strategy also notes a new requirement to include prudent financial limits within which the council must operate and how council will manage its finances. The strategy includes a limit for rates increases and the planned debt level for Greater Wellington over the next 10 years:

- Greater Wellington's net debt is projected to increase from \$115 million in 2011/12 to \$275 million over the life of this Long-Term Plan, but will still be well within sustainable and prudent limits.
- For existing services the average rates increases will be limited to the BERL Local Government Cost Index (this estimates an average cost increase of 3% per annum over the 10 years). For new or additional services the average rates increase will be limited to 5.5% per annum.

3.3 Stakeholder Views

In addition to the above general considerations, interviews were held with key informants to gain their view of whether the various tools are acceptable. The main points raised in these interviews are set out in Appendix Four.

Interviews were conducted with:

- Wellington Branch Property Council – Ian Cassels
- Wellington Chamber of Commerce - John Milford and Jeremy Harding
- New Zealand Retailers Association – Barry Hellberg
- Newtown Business Group – David Wilcock and Martin Hanley
- Kilbirnie Business Group – Bruce Welsh.

The stakeholders had a strong representation of retailers, and this is to be expected as they usually form the core of any local business group.

While appreciative of the potential benefits of the PTS options, concerns tended to focus on the day-to-day impact of any increased costs of running small businesses, accessing business areas/car parking or discouragement of development due to higher council charges. This is

particularly in the context of competition from malls and other retail developments not in the Wellington City area, as well the potential for office-type activities to relocate to lower cost areas on the edge of the urban area.

Relevant comments from these interviews are used in the assessment of each tool.

3.4 Establishing Evaluation Criteria

Each funding tool needs to be assessed against an agreed set of evaluation criteria. The project brief included some criteria, while other criteria were included as part of the proposal to undertake the project. The literature review identified some other sources of evaluation criteria.

To reach a decision on which criteria should be adopted for this study, legislative mandates were reviewed, along with other work that has considered principles of taxation and local authority financing of infrastructure.

This material is set out in Appendix Two. From this material, a proposed set of funding criteria was developed and provided to GWRC in the Stage One report.

Following feedback on the proposed criteria, the following criteria have been adopted:

- **Strategic Fit** - how does the funding tool work in with the regional and local councils strategic outcomes for the area? This aligns with the Local Government Act requirement to consider community outcomes.
- **Acceptability/Feasibility** – this covers legal precedence as well as public understanding and acceptability. This includes notions of transparency and accountability.
- **Effectiveness** – the ability to raise revenue relative to costs, including the potential for leakage/avoidance and the extent to which the revenue source is stable, predictable. Also covers the cost of collecting the revenue. This includes costs to setup and administer the levy or charge, including compliance costs on the people or activities being levied
- **Efficiency** – does the tool result in more or less efficient allocation of resources across the economy, taking into account how the tool may influence the use of resources like roads and land? Desirable/undesirable spin-off effects are also relevant under this criteria
- **Equity** – distributional incidence both in spatial and income terms.
- **Affordability** – the extent to which the option is affordable, i.e. the cost of it compared with what people are willing to pay.

4 Funding Tools

This section reviews the selected funding tools from two perspectives:

- The quantum of funding that may be able to be sourced
- Consideration of the funding tool against the evaluation criteria.

For each funding tool, the concept of the tool is introduced and overseas and local examples are set out prior to considering how that might be applied to Wellington.

Funding tools that seek additional revenue from rates are considered first, then transport users, followed by land uses.

The discussion of each tool includes an assessment of it against the evaluation criteria.

The consideration of the funding tools is partly based on the review of the transport and land use benefits of the options, as set out in Appendix Three. It has also been informed by the feedback received from the series of stakeholder meetings held. An overview of the key issues identified in those stakeholder meetings is set out in the meeting summaries (see Appendix Four).

The quantum of funding possible has been based, in the first instance, on the basis of reasonableness and affordability.

For the purposes of this study, the area served by the PTS has been broken down into two main areas:

- The immediate PTS corridor; and
- The catchments of the bus services that will use the corridor, or feed into the LRT system that will run along the corridor.

Thus, the corridor covers the areas adjacent to the PTS, while the catchments cover the outlying eastern and southern suburbs.

The corridor represents a narrow area either side of the spine. It is assumed that most of the corridor is approximately 800m wide either side of the road carriageway that will contain the PT spine. This reflects a walk of around 10 minutes to access the PTS.

The corridor and catchment sub areas have then both been further subdivided into two:

- The inner corridor covering the area north of the Basin Reserve (effectively the central business area), and the outer corridor covering Newtown, Hataitai and Kilbirnie.
- The catchment area has been divided between its southern and eastern sections, reflecting topography and the areas which feed into the respective arms of the PTS.

Further details are set out in Appendix Four.

4.1 General and targeted rates

4.1.1 Tool Description

A form of tax based on the property value collected from property owners and provided to the local city or regional council to enable it to provide a range of local government services and activities. Rates can be a 'general' rate or a 'targeted' rate.

In considering rating-based options, there is no empirical evidence as to when rates become unsustainable. There has been a general call over recent years for rates increases to be slowed, and to be more in-line with inflation. It can be expected that as rates increase, then some property owners may become unable to pay and seek assistance (such as deferment until sale of property). In other cases, they may leave the city or district to an area with lower rates.

This section discusses three variances on the rating option, specifically:

- Annual Levy - Wellington City only
- Targeted Transport Rate - GWRC area
- Area-based Targeted Rate. - Wellington City only.

4.1.2 Responsible organisation

Greater Wellington Regional Council is responsible for setting its budget and identifying the rates requirement accordingly. It relies on data from the respective TLAs in its region to provide rating information about each property.

In its Revenue and Financing Policy (Long Term Plan 2012-22), GWRC explains that its uses general rates to fund activities that reflect "public good" with a broader, whole of society benefit. Examples of general rates include resource management, biodiversity management, pest management and flood protection activities. Also included in the general rate is an activity listed as 'Regional transport planning and programmes'. That activity area is focused on fulfilling statutory planning requirements and advocacy programmes. It does not include activities that require capital expenditure on the public transport network.

In setting the general rate, the council apportions required revenue across the whole region on an (equalised) capital value basis⁶. Greater Wellington does not charge general rates on a differential basis. General rates are budgeted to provide \$27,468,000 for the 2012/13 financial year.

General rates are distinct from targeted rates, which are intended to recover costs of particular activities that benefit particular groups. The council has adopted a differential basis for setting targeted rates. The council has adopted a number of targeted rates, including:

- Transport rate

⁶ Equalised value takes into account different valuation dates.

- River management rate
- Stadium purposes rate
- Bovine Tb vector control rate
- Regional possum/predator control rate
- Wairarapa scheme rate (river management, catchment and drainage)
- Wellington Regional Strategy (WRS) rate
- Warm Greater Wellington Home Insulation rate.

The transport rate, discussed more below, is in the order of \$47m per year.

The council's overall approach to rating is to:

- Spread the incidence of rates fairly over the region
- Provide a consistent approach to different categories of ratepayer across the region
- Ensure that all ratepayers contribute as fairly as possible to fund Greater Wellington services
- Provide Greater Wellington with the income it needs to achieve its objectives and carry out its activities, in accordance with community needs and expectations.

4.1.3 Legislative Mandate

Section 103(2) of the Local Government Act 2002 sets out the range of funding mechanisms that local authorities can use to fund their activities. The Local Government (Rating) Act 2002 details the type of rates that can be collected (including general and targeted rates) and the processes local authorities must follow in setting rates.

4.1.4 Quantum of potential funding - Annual Levy

The focus of an annual levy would be Wellington city, reflecting the fact that people and businesses in the city are the main recipients of the PTS benefits.

The total capital value of property in Wellington city on which rates are levied is recorded by GWRC as \$47 billion, of which residential property accounted for 80% and commercial property 20%. There are 75,000 properties that pay rates. An option would be to use Wellington city's general rating formula and increase rates accordingly. However this approach would place a significant amount of the additional rate on commercial properties, not necessarily reflecting benefits. Currently commercial properties pay over 40% of rates, yet comprise 20% of total rateable value.

An alternative would be to impose a uniform annual levy on all rateable properties within Wellington city. This would be a flat levy, not related to property value or location. Such a levy would not reflect any principles of ability to pay but would recognise in a very simplistic way, the extent of main benefit of the PT spine project as being contained within the city and spread between different activities.

Its justification would be as a “simple-to-apply” funding tool to help fund infrastructure projects that are likely to have city-wide benefits. Revenue could be used to assist the funding of other transport projects, not just the PT spine project. It could be applied for a set period of time, e.g. 20 years.

4.1.5 Examples

Stage One of the Gold Coast light rail project is jointly funded by Gold Coast City Council, the Queensland Government and the Australian Government.

As part of this funding package, the Gold Coast City Council introduced a uniform “transport levy”. The council has recently agreed to increase this levy by \$17.50. This will take the total levy to \$111 per property, generating \$37 million annually for the council. The transport levy is used to expand transport services in remote areas, expand community transport and trial a ferry service, as well as contributing to the cost of the rapid transit project (e.g. \$24m goes towards funding Stage 1 of the Gold Coast Rapid Transit light rail project).

4.1.6 Potential Revenue

Table 8 sets out the revenue that might be gained from a \$50, \$100 and \$200 annual levy, levied on all rateable properties within Wellington city. Currently, residential ratepayers in the city pay an average of \$1,900 dollars.

The mid figure of \$100 per property is used as this is considered to be reasonable figure. It is also about half of the additional amount of money that households in the city would pay, if they paid the national average per household expenditure on rates, on a percentage basis. That is, nationally households spend about 2.7% of their income on rates and related expenditure. In Wellington, if that same percentage applied, households would spend around \$200 more per year than they currently do. The \$100 per annum is also equal to the estimated annual public transport benefit of the PT spine BRT option. The \$50 and \$200 are options around this midpoint.

Table 8: Revenue from annual levy on Wellington city ratepayers (\$m)

	\$50 annual levy	\$100	\$200
Annual revenue based on 75,000 ratepayers	\$ 3.75m	\$ 7.5m	\$ 15m

A levy charged just within Wellington city recognises that most, but not all of the benefit is seen within the city. The data on travel time in Appendix Four suggests that only 5 to 10% of travel time benefits is experienced by those living outside the city.

4.1.7 Quantum of potential funding - Targeted Transport Rate

GWRC Existing Transport Targeted Rate

The transport targeted rate funds Greater Wellington’s net expenditure (after deducting fares and Central Government contributions) for the region’s public transport services, including public transport operations, infrastructure and marketing activities.

The transport rate for the 2012/13 year is budgeted to be \$47,512,000 out of a total pool of targeted rates of \$61,536,000 representing 77% of all targeted rates. For a typical Wellington city

ratepayer, this targeted rate works out to a cost of \$142 per year (based on an average valued residential property of \$511,044).

Table 9 sets out a simple calculation if the current targeted rate was increased by 10% to 40%. A 20% increase would raise a similar revenue stream as a \$100 annual levy on all Wellington city ratepayers.

Table 9: Revenue from increases in existing transport targeted rate

Increase	Annual Revenue
10%	\$ 4,751,178
20%	\$ 9,502,356
30%	\$ 14,253,534
40%	\$ 19,004,712

Using the formula set out in the Regional Council's LTP, the additional revenue would be distributed around the region as set out in Table 10.

The bulk of the increase would be experienced in Wellington city, with 60% of the additional revenue falling within the commercial and residential sectors.

Table 10: Effect on different cities/ districts of increase in targeted rate

	10%	20%	30%	40%
Wellington City				
Downtown	\$ 1,818,473	\$ 3,636,946	\$ 5,455,419	\$ 7,273,892
Urban	\$ 1,062,932	\$ 2,125,864	\$ 3,188,796	\$ 4,251,728
Rural	\$ 3,802	\$ 7,604	\$ 11,405	\$ 15,207
Lower Hutt				
Urban	\$ 826,132	\$ 1,652,265	\$ 2,478,397	\$ 3,304,530
Rural	\$ 3,498	\$ 6,996	\$ 10,494	\$ 13,992
Upper Hutt				
Urban	\$ 306,089	\$ 612,177	\$ 918,266	\$ 1,224,355
Rural	\$ 9,305	\$ 18,610	\$ 27,915	\$ 37,220
Porirua				
Urban	\$ 424,610	\$ 849,219	\$ 1,273,829	\$ 1,698,438
Rural	\$ 7,976	\$ 15,952	\$ 23,928	\$ 31,904
Kapiti Coast				
Urban	\$ 208,555	\$ 417,110	\$ 625,665	\$ 834,220
Rural	\$ 10,247	\$ 20,494	\$ 30,740	\$ 40,987
Masterton District				
Urban	\$ 20,106	\$ 40,213	\$ 60,319	\$ 80,425
Rural	\$ 5,905	\$ 11,810	\$ 17,714	\$ 23,619
Carterton				
Urban	\$ 9,178	\$ 18,357	\$ 27,535	\$ 36,713
Rural	\$ 5,526	\$ 11,052	\$ 16,578	\$ 22,104
South Wairarapa				
Urban	\$ 17,694	\$ 35,387	\$ 53,081	\$ 70,774

	10%	20%	30%	40%
Rural	\$ 11,151	\$ 22,301	\$ 33,452	\$ 44,602
Total	\$ 4,751,178	\$ 9,502,356	\$ 14,253,534	\$ 19,004,712

Table 11 sets out the impact on Wellington city ratepayers. Under the GWRC transport rate formula, Wellington city urban (non CBD) ratepayers would see, as an example of the effect of the above formula, a 20% lift in the transport targeted rate resulting in a \$28.48 increase in the average annual transport rate.

Table 11: Increase in transport targeted rate for Wellington city residential ratepayers

	Current	10% additional	20%	30%	40%
Total Residential component	\$ 10,629,319	\$ 11,692,251	\$ 12,755,183	\$ 13,818,115	\$ 14,881,047
Per Assessment	\$ 142.38	\$ 156.62	\$ 170.86	\$ 185.09	\$ 199.33
Additional		\$ 14.24	\$ 28.48	\$ 42.71	\$ 56.95

Currently under the regional rate, 25% of the rates sought are borne by the CBD, with other revenue based on the levels of service enjoyed by the different cities and districts. The result is that about 60% of the rate is sourced from Wellington city and 40% from elsewhere.

The analysis of travel time data suggests that the rest of the region experiences only a small direct benefit from the PT spine project, with faster travel times within the CBD and the ability to transfer to more efficient services linking into areas south of the CBD, such as Newtown. About 5% to 10% of the benefits are experienced by people who live outside Wellington city.

The use of the current targeted rate would therefore place a higher proportion of costs on non Wellington city residents, compared to assumed benefits. On the other side of the coin, in the future other regional transport projects may benefit other areas more than Wellington city.

4.1.8 Quantum of potential funding - Area-based Targeted Rate

Rather than use the current transport targeted rate or a city-wide annual levy, an area-based targeted rate could be applied to the area most likely to benefit from the PT spine project, being the PTS corridor and catchment (i.e. southern and eastern suburbs).

Table 12 lists the current capital values for these areas and their share of the total capital value for Wellington city as a whole.

Table 12: Area-based targeted rate

Area	Capital Value	Share of total
Inner Corridor	\$13,161,567,114	24%
Rest of Corridor	\$7,877,501,250	15%
East Catchment	\$5,619,407,000	10%
South Catchment	\$2,823,830,400	5%
Rest of City	\$24,554,563,001	45%
Total	\$54,036,868,765	100%

In contrast to the above distribution, Table 13 provides one estimate of potential benefits of the PTS, based on the information set out in Appendix Four on transport outcomes. It is assumed that the central city and corridor see the greatest benefit. The rate would be distributed as follows, if \$7.5 or \$15m was sought annually:

Table 13: Possible share of benefit - area-based targeted rate

Area	Share of benefit	\$7,500,000	\$ 15,000,000	Cents in the dollar (\$7.5M)	Cents in the dollar (\$15m)
Inner Corridor	50%	\$3,750,000	\$ 7,500,000	0.00028	0.00057
Rest of Corridor	25%	\$1,875,000	\$ 3,750,000	0.00024	0.00048
East Catchment	16%	\$1,200,000	\$ 2,400,000	0.00021	0.00043
South Catchment	9%	\$675,000	\$ 1,350,000	0.00024	0.00048
Total	100%	\$7,500,000	\$15,000,000		

Table 14 provides the calculation of the additional rate per property.

Table 14: Area-based rate, average additional rate per property

Area	Average CV	Rate per property (\$7.5M)	Rate per property (\$15M)
Inner Corridor	\$ 1,035,447	\$ 295	\$ 590
Rest of Corridor	\$ 750,167	\$ 179	\$ 357
East Catchment	\$ 642,659	\$ 137	\$ 274
South Catchment	\$ 527,720	\$ 126	\$ 252
Rest of City	\$ 566,949	\$ 0	\$ 0

The area-based targeted rate is levied on a smaller population than the regional transport rate, and as a result the amount gathered may not be as large as the other rating methods due to the need to recognise people's expected benefit and ability to pay.

To provide enough revenue to finance the BRT option (approximately \$5m per year):

- An flat, annual levy on all rateable properties in Wellington city of \$70
- The regional transport targeted rate would need to increase by around 12%, or perhaps \$15 per residential property in Wellington city
- An area-based targeted rate could be imposed on the corridor and catchment, ranging from \$80 to \$200 per property.

4.1.9 Assessment against Evaluation Criteria

Table 15: Targeted rates (flat transport levy, increase of targeted regional rate, targeted rate in PT Spine corridor)

Criteria	Assessment
Strategic Fit	An area-based rate may be seen to be counter to moves to promote more housing and businesses along the PTS corridor.
Acceptability/Feasibility	General rates generally viewed as an accepted method of financing as the costs can be spread across a wider population base, reducing the direct impact on any one household. However, substantial increases likely to be resisted by ratepayers. Targeted rates raise issues of benefit versus burden.
Effectiveness	Highly effective. Revenue source is reasonable stable. Existing mechanisms in place to collect rates, so no additional costs of administration.
Efficiency	An area-based targeted rather than general rate better aligns the investment with those who may benefit from the investment in improved infrastructure.
Equity	For each of the sub-options, it could be argued that a notable proportion of the wider Wellington region would not benefit on a daily basis from the PT spine, so should not have to contribute. Lower income households and those on fixed incomes may struggle to pay. It is noted that Newtown in particular has a high proportion of social housing. Higher rents as a result of increased rate may force such families to relocate further away to avoid additional charges.
Affordability	Rates increases are likely to be challenged as not being affordable for low income / fixed income households

4.1.10 Potential Risks and Implications

Significant rates increases are generally seen to be problematical in today's economic climate.

If rates are to be used to help fund the PTS, then a mix of general and targeted-based rating approaches are likely to be needed.

4.2 Raising Fare Box

4.2.1 Tool Description

This option explores the extent to which public transport fares could be increased to help recover costs.

The BRT option increases patronage, and as a result, incomes from fares will increase somewhat. 700 extra trips are estimated across the network in the morning peak. At an average of \$2.10 per trip (reflecting most additional trips are by bus), this equals an extra annual income

of around \$2m a year. The LRT option sees no increase in passenger numbers. Increased revenue from additional patronage is taken into account in the financial evaluation set out in section 1.3.1.

Presently, fares are set on a "network-wide" basis. As a result one option is to raise fares for all trips across the entire network. The other option is to raise fares just for the enhanced services that will use the PTS. This may reflect a greater willingness of users of the PTS to pay for trips that are faster, more reliable and possibly on more comfortable vehicles. An example of people's willingness to pay for higher quality services is the air port flyer.

It is noted that there is general pressure from NZTA for at least 50% of public transport costs to be met by users, and as a result fares may need to rise no matter what option is selected.

4.2.2 Responsible organisation

Greater Wellington Regional Council.

4.2.3 Legislative Mandate

The Land Transport Management Act.

4.2.4 Quantum of potential funding

Presently, the region collects in the order of \$90m annually from 35 million public transport users across the bus and rail network, or an average of \$2.50 per trip.

A rise in fares is generally accompanied by a reduction in use. For example for the PTS study, using the GWRC passenger transport model, the regional council estimated that a 30% increase in fares may result in a 5% decrease in public transport trips, whilst a 30% decrease results in a 6% increase in trips.

This response is less than what other studies and guides anticipate. NZTA in their Economic Evaluation Model state that short run elasticities are in the order of -0.25. Todd Litman reports that the price elasticity of transit ridership with respect to fares is usually -0.2 to -0.5 in the short run (first year), and increases to -0.6 to -0.9 over the long run (five to ten years) (Litman 2004b; McCollom and Pratt 2004; Wardman and Shires 2011). This suggests that a 10% fare increase typically increases revenue by 5-8% over the short run and 1-4% over the long-run.

As a result of this elasticity, Litman suggests that raising fares does increase revenue, but revenue gains tend to decline over time. This is particularly due to discretionary users (e.g. off peak users, youth, elderly) changing travel patterns as a result of the higher prices. Commuters during peak period are likely to be more willing to pay the higher charges as they have fewer alternatives.

4.2.5 Network wide fare increases

Desk top modelling of revenue based on a 10% and 30% increase in average fares for all trips across the network, and assuming a 3 percent reduction in patronage of peak trips and 5 percent decrease in inter peak trips for every 10% rise in fares, suggests that revenue might increase to \$95 to \$102M – a \$5 to \$13 million increase. Patronage drops to 31m riders under a 30% increase, indicating negative effects in terms of increased congestion. See Table 16.

Table 16: Estimated revenue from fare increases

Fare increase	Patronage	Average fare \$	Revenue \$M	Increase in annual revenue (\$M)
2011	35,103,544	\$ 2.54	\$ 89.3	
10%	33,710,729	\$ 2.80	\$ 94.4	\$ 5.10m
30%	30,925,098	\$ 3.31	\$ 102.5	\$ 13.20m

A 10% rise in fares would therefore fund the BRT option.

The GWRC expect fares to increase by 3% annually to reflect inflation and general increase in operating costs. Between 2011 and 2031, public transport patronage across the network is expected to grow by 16%, to 40.7m passengers. Revenue will grow to \$187million. Based on the same assumptions as above, Table 17 sets out estimates of revenue by 2031, taking into account a 10% or 30% increase in fares.

Table 17: Estimates of revenue for fare increases by 2031

	Base	10%	30%
Passengers	40,720,111	39,104,445	35,873,113
Annual Revenue \$M	\$ 187.09	\$ 197.73	\$214.62
Average fare \$	4.59	\$5.06	\$5.98
Increase in revenue over base		106%	115%

By 2031, additional revenue under a 10% fare increase would have risen to \$10m annually, up from \$5million in 2011, while a 30% increase sees \$27.5m additional revenue.

Table 18: Additional revenue, by 2031

	10% (\$5.06)	30% (\$5.98)
Additional annual revenue, by 2031, over anticipated average fare of \$4.59	\$10.64m	\$27.53m

4.2.6 Fare Increases for PT Spine Services

The BRT service significantly reduces travel times for many users, while LRT introduces an improved "style" of service. Some people may be willing to pay for these improvements.

As an example, a normal bus ride from Kilbirnie to the CBD costs \$4.50 each way. The same trip on the airport flyer costs \$7.00 each way. The airport flyer involves a more comfortable ride, with services such as Wifi.

NZTA, in their Economic Evaluation Manual, state that people's in vehicle value of time for passengers sitting on a commuter bus is \$4.70 an hour (2002 \$ figure). If the BRT option saves about 7 minutes on average for a trip from the south and east into the CBD, then this represents a saving of around 70c per trip, or \$1.40 per day, in 2013 figures. If 50% of this saving was captured by revenue increases, then across 7,000 passengers this represents a potential increase in annual revenue of \$1.2m per year (and assuming that the increase in fares reduces patronage by about 5%).

Increasing fares for a particular service is likely to spark calls from people not willing to pay for the extra service speed and/or quality that they have no other public transport choice, there being no alternative, lower fare services for the PTS routes.

4.2.7 Assessment against Evaluation Criteria

Table 19: Fare Box Increase

Criteria	Assessment
Strategic Fit	Raising fares faster than currently planned is counter to moves to increase public transport use
Acceptability/Feasibility	<p>There is a general degree of support for the user-pays principle, but with respect to public transport, most people also understand that significant fare increases will make public transport unaffordable and are counterproductive.</p> <p>Raising fares across the board to pay for improved services in one part of the region only is likely to be seen to be unacceptable by many.</p>
Effectiveness	<p>Network wide fare increases easy to implement and already occur on a relatively frequent basis – i.e. every 1-2 years.</p> <p>Moderate fare elasticity means that fare increases lead to useful increases in fare revenue</p>
Efficiency	Fare increases decrease passenger transport use. This is in a context of fares being subsidised below their true cost so as to create an incentive for people to use PT, in turn reflecting the fact that private motorists do not face all of the costs that they impose on others. Increasing fares may therefore increase externalities caused by motorists, if more people drive.
Equity	<p>Fares generally seen as equitable because people part pay for the services they use. However increasing fares will likely mean a decreasing portion is paid by ratepayers/taxpayers which results in perception that car users 'benefit' more and public transport users are effectively 'double taxed'.</p> <p>Affects access to transport options for low-income users in the corridor.</p>
Affordability	Public transport users on low incomes / fixed incomes are likely to resist fare increases due to increased costs and limited alternatives.

4.2.8 Potential Risks and implications

Increasing fares for one service in part of the region could create a perception of unfairness and bring into question the network-wide funding approach for public transport across the region.

4.3 Petrol Price Increases

4.3.1 Tool Description

A regional fuel tax was developed by the previous (Labour-led) government as a means for the Auckland rail electrification project to be funded in a way that could be seen as regionally equitable. A regional fuel tax option was subsequently made available to all regions. The regional fuel tax could raise up to 10 cents per litre of petrol and diesel for expenditure on nominated capital projects that would not otherwise be funded.

The Auckland regional fuel tax scheme that had been approved provided for a 2 cents per litre tax from 1 July 2009, a 5 cent per litre tax from 1 July 2010 and a 9.5 cent per litre tax from 1 July 2011. Revenue from this tax would have been used to fund almost \$750 million in public transport infrastructure improvements in Auckland, \$150 million toward the cost of Penlink and to meet the financing costs of Crown borrowing for the \$500 million allocated for electrification of the Auckland passenger rail network.

The current, National-led government repealed the legislation authorising regional fuel taxes. Separately, the government has recently determined that it will increase the national fuel excise levy by 3 cents for each of the next 3 years.

4.3.2 Responsible organisation

Greater Wellington Regional Council.

4.3.3 Legislative Mandate

There is currently no legal mandate for this funding option. The government has recently amended the Land Transport Management Act to repeal the ability for regional councils to collect a regional fuel tax⁷.

Prior to these amendments, the Land Transport Management Act provided for a region to impose a regional fuel tax. The key elements of this tax were that:

*a region to obtain, by the imposition of a fuel tax for the region (known as a **regional fuel tax**), the funding that it needs to contribute to capital projects that—*

- (a) will result in a net benefit to the region; and*
- (b) are a priority for the region; and*
- (c) will not reasonably be fully funded from sources other than a regional fuel tax within the time frame desired by the region.*

The government's justification for removing this funding option was perceived high compliance cost issues; boundary effects; prices being spread across the country rather than in the area of benefit; and the effect of higher fuel prices on non-road users (e.g. farmers). The Green Party presented a minority view on this aspect of the Bill noting that:

⁷ Land Transport Management Amendment Bill 2012 given royal assent on 12 June 2013.

We note that many submitters opposed the removal of this funding tool. A regional fuel tax is a transparent and inexpensive way for regions to raise revenue. It makes sense to use fuel taxes to pay for alternatives because:

- 1) *Public transport alternatives are a cost effective way to free up the roads for those who are driving, and*
- 2) *It provides a price signal that will further encourage those at the margins to choose the more cost effective option.*

The amendment to repeal these provisions was finalised after the commissioning of this study, which specifically sought to include this option. Though the option is no longer mandated, given GWRC's continued advocacy to retain this tool, it is useful to see how it compares against other possible funding options.

4.3.4 Quantum of potential funding

In 2005 the Ministry of Transport estimated that a 5c per litre tax levied in the Wellington region would yield \$15-17.5 million annually.

The GWRC transport model contains outputs relating to litres of fuel consumed, based on assumptions about VKT, the vehicle fleet and anticipated increases in fuel prices. The table below sets out estimated litres consumed, for 2011 to 2031, for the three PTS options. There is little difference between them in terms of fuel consumption as they only have a modest impact on vehicle use across the region.

Table 20: Fuel consumption in Wellington Region (1,000 Litres)

	Ref	Bus	BRT	LRT
2011	271,869	-	-	-
2021	271,583	271,518	271,832	272,120
2031	285,612	285,541	286,050	286,609

A Regional Fuel Sales tax would be applied to all petrol sales within the region. This is different to litres consumed by vehicles in the region, as some petrol may be purchased outside the region, while some fuel will be consumed by trips that go outside the region. Nevertheless, there is likely to be some correlation.

A 2007 study for Land Transport New Zealand (Impacts of fuel price changes on New Zealand transport David Kennedy and Ian Wallis, Booz Allen Hamilton (NZ) Ltd, Wellington) calculated that a 10% (real) rise in the price of petrol will affect petrol consumption as follows:

- Petrol consumption will decrease by 1.5% within a year
- Petrol consumption will decrease by 2% after two years.

That is, short run elasticity = -0.15 and medium run elasticity = -0.20.

Taking a 2% price elasticity, and applying the current consumption based on today's fuel prices, the following revenue potential is calculated. Because the fuel price increase is only small and the elasticity of demand fairly weak, the increase in tax makes little impact on the amount of fuel consumed.

Table 21: Revenue from petrol price increases

Cents per litre	Annual Revenue \$M
1	\$ 2.7
2	\$ 5.4
3	\$ 8.1
4	\$ 10.8
5	\$ 13.5
6	\$ 16.2
7	\$ 18.9
8	\$ 21.6
9	\$ 24.2
10	\$ 26.9

Large changes in fuel prices (e.g. drop in Kiwi dollar, increasing world prices) would affect the above calculations. More fuel efficient vehicles and growth of hybrid/hydrogen powered vehicles may further affect consumption on a per capita basis.

Table 21 suggests a revenue stream of around \$13.5m per year, at a 5c increase. This does not include additional road user charges for diesel powered vehicles. A 2 to 3 cents per litre increase would fund the BRT option.

The revenue generated from the GWRC transport model data is somewhat less than the Ministry of Transport's estimate in 2005 of a \$15m to \$17m, but still comparable.

4.3.5 Assessment against Evaluation Criteria

Table 22: Regional Fuel Tax

Criteria	Assessment
Strategic Fit	Assists with travel demand management, but in a indirect way compared to other tools
Acceptability/Feasibility	Broad base funding tool that isn't targeted to those who may benefit from PT spine project. No longer a legal mandate for this option. However, reasonable level of support from stakeholders interviewed on this option. Considered reasonably fair and direct way of collecting revenue from a broad range of people if money is spent directly on public transportation projects in the region (rather than being put into central government consolidated funds).
Effectiveness	May result in avoidance (where people purchase petrol outside of the region). Increased use of fuel-efficient vehicles may lead to long term decline in fuel consumption. Administrative collection costs would need to be established.

Efficiency	Low elasticity therefore high funding leverage (i.e. demand for petrol does not drop off quickly with price rises). Does target car use but is a blunt tool that does not recognise marginal costs of car use (e.g. congestion during peak times) and imposes higher costs on non-car users of petrol.
Equity	Create significant effects on non-road users (who use fuel for business purposes) e.g., industries such as farming, forestry, fishing, manufacturing and construction.
Affordability	Small increase in fuel prices likely to be relatively affordable for most households - car users have options to combine car trips, car pool etc, walk/cycle for short trips

4.3.6 Potential Risks and implications

Petrol price increases are not currently an option, but it may become so in the future (e.g. upon change of government). However introduction, then repeal of previous empowering legislation means that the revenue source could be "turned off" at some point by central government.

Long term, with increases in fuel efficiency, greater use of electric/hybrid vehicles and higher "base" costs of petrol, then fuel consumption may fall on a per capita basis, reducing revenue streams.

4.4 Parking levy tool

4.4.1 Tool Description

A parking levy could be applied to car parking in a defined area, such as in the CBD.

A parking levy is a relatively straight forward, although indirect way, of charging motorists for use of congested roads. Revenues gained can be used to fund alternative transport options.

The tool does not involve the complexities of road pricing, nor the indirect, general nature of fuel tax increases. It is targeted at those who generate congestion.

The benefits of reduced demand for car parking spaces in the CBD as a result of improved public transport services is recognised in the economic appraisal of the PTS.

4.4.2 Responsible organisation

The Greater Wellington Regional Council or Wellington City Council would impose a parking levy to be charged through the rating process. This would require an initial survey of all existing private car parks in the CBD and then regular update of this.

4.4.3 Legislative Mandate

Yes. Local Government (Rating) Act. A parking levy could be imposed via the council's normal rating process, although the ability to impose an annual charge specifically on car parks would need to be confirmed.

4.4.4 Examples of other parking levies

The government of New South Wales in Australia levies some parking spaces in Sydney. The parking space levy (PSL) is one of a number of NSW government strategies to discourage car use in major commercial centres, encourage the use of public transport and improve air quality. In 2010/11 the PSL receipts were \$97.3 million.

The parking space levy is payable on any non-residential space used or set aside for a motor vehicle, including:

- Off-street commercial and office parking spaces
- Parking spaces in parking stations
- Marked and unmarked spaces
- Vacant land used for parking motor vehicles.

The parking space levy applies in two leivable districts. From 1 July 2012, rates for these districts are as follows:

- Category 1: City of Sydney and parts of the North Sydney and Milsons Point business districts. The annual levy for leivable parking spaces in category 1 districts is \$2,160.
- Category 2: Bondi Junction, Chatswood, Parramatta, St Leonards. The annual levy for leivable parking spaces in category 2 districts is \$770.

The levy is adjusted each year in line with inflation.

Some parking spaces are exempt from the PSL, for example where a space is set aside exclusively for:

- The parking of motor vehicles by persons who hold mobility parking scheme authorities
- The parking of motor vehicles by persons who reside on the premises or on adjoining premises
- The parking of motor vehicles for the purpose of loading/unloading of goods or passengers
- The parking (without charge) of any motor vehicles owned or occupied by a religious body, a public charity or benevolent institution.

In Melbourne, Victoria, a similar levy applies, called the congestion parking levy⁸. This levy is \$930 for 2013. However, subject to the passage of legislation, the congestion levy will be \$1,300 for 2014.

It is reported that the Victorian State government will take \$440 million a year from people parking their cars in the city centre, after increasing and extending the levy on car parking spaces.

⁸ Parking Price Policies – A review of the Melbourne congestion levy. Australasian Transport Research Forum 2011 Proceedings , 28 – 30 September 2011, Adelaide, Australia

SKM Wellington Region Road Pricing Study Stage 2 Report

This study investigated parking charges as a method of travel demand management (rather than revenue raising). Initial investigations (based on parking charges of \$2, \$4, \$6 and \$8 added to all home-based work trips in the AM peak traffic) showed only very minor reductions in congestion at eight key bottlenecks around the city and region. As a result that option was not pursued further from a congestion management point of view. No estimate was made of revenue.

4.4.5 Quantum of potential funding

There are multiple ways to calculate the potential quantum of funding able to be generated by parking. This study presents two methods. The first method is developed using the WTSModel which places additional charges on car trips terminating in the CBD. The second method is based on applying the charge on the actual car parks in the city and makes some assumptions around typical use to generate a funding source.

Appendix Five contains a table which sets out the known information about the number and type of car parks in the CBD area. In summary there are:

- Approximately 3,500 short stay on-street car parks
- Approximately 28,000 car parks that are privately owned and managed, either as part of individual buildings, or as parking operations.

4.4.6 Method One – WTSModel – car trips terminating in the CBD

Similar to the approach adopted for the SKM parking charge study outlined above, the WTSModel was used to model the potential revenue of a parking charge option.

Two scenarios were run. The first just targeted trips that terminated in the CBD during the AM peak. This could be said to be a congestion-based scenario. The second scenario targeted all trips that terminated in the CBD during all of the day and weekend, with non commuter trips charged at a much lower rate than commuters. This can be described as a revenue raising scenario. Table 23 sets out the details of the two scenarios.

Table 23: WTSModel-based scenario

Component	Scenario One - A - AM Peak Trips Only	Scenario One B – All trips to CBD
Parking Charge Area	Same area described in the cordon charging option	Same area described in the cordon charging option.
Charging period	AM peak only	Weekdays, 24 hours
Direction	Only AM peak trips terminating in the CBD	All car journeys terminating in the area
Vehicle classes	All vehicle classes	All vehicle classes (except HCV).

Trip purpose	All AM peak trips charges 100% of levy	Commuting trips charged 100% of levy; non-commuting purpose trips charged 15% of levy.
Charges tested	\$2, \$4, \$6	
WTSM	BRT and LRT scenarios	
Administration costs	No ongoing administration costs have been assumed with this model. Though there will be initial set up costs to change existing cost charging structures, the long term annual collection costs will be minimal. Some enforcement costs can be expected	
Other comments	Revenue is annualised	The revenues are annualised using the modelled AM, IP and PM factors.

Table 24 sets out the model results for the AM peak scenario. Revenue is in the order of \$12m to \$32m. This is based on approximately 25,000 trips paying the surcharge, for 250 days per year.

Table 24: Estimated revenue, AM peak parking charge

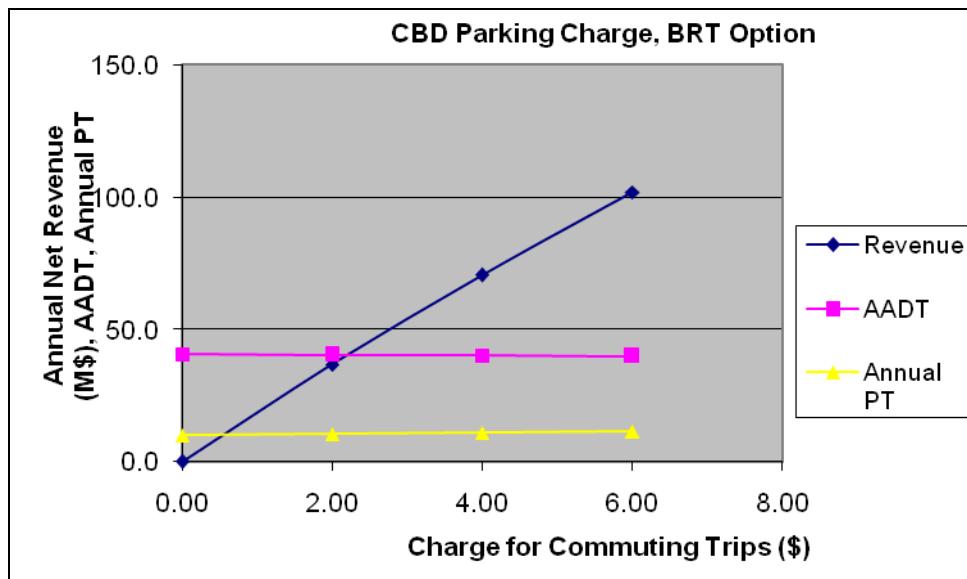
	No charge	\$2	\$4	\$6
Annual Revenue (\$m)	0.0	\$12.4m	\$23.1m	\$32.3m
AM Vehicles annual million	9.0m	8.8m	8.6m	8.3m
AM PT annual - millions	5.8m	6.2m	6.5m	6.8m

Figure 7 shows the second - all day - scenario.

A \$2 per AM and PM peak trip and 30 cents per inter peak and weekend trip generates almost \$40m annually.

The graph shows the expected revenue, as well as the number of passenger transport trips and annual average daily traffic. The graph shows no significant reduction in trips into the CBD as a result of the charge, and no significant switch from cars to passenger transport.

Figure 7: All day car parking charge



The very high revenue figures in Figure 7 are likely to be overstated. A large amount of the revenue is sourced from short term parking and, based on the stakeholder interviews, there will be stiff opposition from CBD retailers and other businesses to any hike in hourly parking rates for short stay parking.

In both scenarios there is a question mark as to whether the transport model is accurately reflecting changes in transport behaviour should the costs of vehicle trips into the CBD increase. In both scenarios car use does not appreciably reduce (for example compared to the congestion charge method discussed in the next section).

As a result of this issue, a different method of calculating revenue was tested.

4.4.7 Annual levy applied to car parks

To address the board brush approach of the transport model, and to focus the tool on commuters, this method looks more closely at the revenue which might be generated from an annual parking levy as applied in Melbourne and Sydney. The focus would be on the parking provided for workers as part of a business, and / or which is provided as a commercial operation. The levy would apply to the car park owner, rather than the car park user.

It is assumed that daily parking in the CBD costs an average of \$12. Car parking costs vary depending upon location of the car park, with parking closer to main employment areas more expensive than parking on the fringe of the CBD.

It is often stated that typical short run elasticities of the impact that parking prices have on car travel demand range between -0.1 and -0.6, with an average of -0.3. However empirical evidence is that elasticities may be on the lower side of this range. This is because car users may not always face the additional car park charge. If a \$250 or \$500 per year parking levy was imposed on central city car park owners, then it is likely that some of that extra cost will be passed onto motorists, some will be absorbed by operators / businesses and some may be compensated for by increased salaries. This cost sharing will affect the extent to which the car parking charge acts as a deterrent to travel by car.

Assuming that all of the costs are passed onto motorists by private car park operators and firms that provide car parking to staff, it can be expected that the higher charges will result in fewer vehicle trips. The following table sets out the assumptions as to potential revenue, taking into account a price elasticity of -0.2.

The charge is assumed to apply to around 20,000 car parks, less than the 28,000 private car parks recorded in council's parking survey. This is to allow for some "leakage" / exemption of car parks out of the charging net.

The annual charge is converted into an effective daily charge to allow for some under utilisation of car parks (i.e. not every car park will be used every day and therefore car park operators will have to cover this is their daily rate).

Table 25: Levy applied to car parks

Annual charge \$	\$250	\$500	\$1000
Effectively daily increase (\$), per working day	\$1.25	\$2.5	\$5
% increase over \$12	10.4%	20.8%	41.7%
decrease in parking demand (%)	-0.021	-0.042	-0.083
Daily parking demand	19,583	19,167	18,333
Annual revenue \$M	\$4.90	\$9.58	\$18.33

Under this scenario, revenues are estimated to be in the order of \$5m to \$18m per year. If less of a reduction in vehicle trip making is assumed due to cost spreading, and as the size of the CBD increases, then the number of car parks may grow, and with it potential revenue.

4.4.8 Assessment against Evaluation Criteria

The two methods present quite different findings. Part of this difference may be explained by the slight differences in the areas of parking modelled in each scenario. Even so, a conservative approach would be to rely on the findings outlined in method two, which suggests an annual quantum of funding in the range of \$5 to \$10m, this being based on a \$250 or \$500 annual charge per car park.

Table 26: Parking Levy

Criteria	Assessment
Strategic Fit	The tool aligns with intentions to manage congestion and improve the quality of the environment in the central area from fewer vehicles. However it may be seen to be counter to moves to promote the CBD as the main commercial hub for the region, if any charge is set too high.
Acceptability/Feasibility	A CBD parking levy that captures off-peak trips will be strongly resisted by CBD retailers in particular, who maintain that the current parking fees are already too high. Suburban retailers (i.e. Newtown and Kilbirnie) noted that making CBD parking more expensive would likely reinforce people's decisions to shop locally or shop even further afield in shopping areas with free parking.

Effectiveness	A car park-based levy is likely to be more effective than a levy based on the user of a car park. It will be easier to collect and be more certain. There will be some initial upfront costs to gather accurate information about number of car parks in the city and to monitor changes. Once in place, should be a stable and reliable source of funding.
Efficiency	A parking charge that raises the cost of private vehicle travel closer to marginal social cost should be efficient, but it is a fairly blunt tool, and not all costs will be passed onto the car park user when the car park itself is levied. Reduced demand for car parking spaces in the CBD should allow land/floor space used for more productive purposes (e.g. office space).
Equity	Commuters have the choice to use public transport to access CBD workplaces. A broad based parking levy may capture inner city residents (who, in theory, do not contribute to congestion). Exceptions could be granted but this will increase administrative complexity.
Affordability	A \$250 / \$500 annual levy targeted at commuter parking would be affordable with costs likely to be spread between car park operators, motorists and employers.

4.4.9 Potential Risks and implications

A car park levy will raise revenue, but will not necessarily influence travel behaviour.

There may be a risk that some central city businesses will shift to other locations to avoid the parking charge.

Recent moves to impose fringe benefit tax on car parks provided as part of an employment package met with significant opposition.

Identifying and monitoring employer provided car parks may be difficult.

4.5 Road Pricing

4.5.1 Tool Description

Road pricing is gaining attention as a method of demand management, as well as a more targeted method of raising funds for transport projects, than petrol taxes. A range of road pricing schemes can be applied - from those aimed at managing a network as whole, to those aimed at reducing demand for travel at certain times or in certain places.

4.5.2 Responsible organisation

In the event that there were a legal mandate, it is likely that the Regional Council would need to take responsibility for the administration of this funding scheme.

4.5.3 Legislative Mandate

No current legal mandate. The Land Transport Management Act provides for road tolls, but not the specific circumstances of where road pricing is applied to a particular area where there are no free alternatives.

4.5.4 Examples of road pricing

Wellington Region

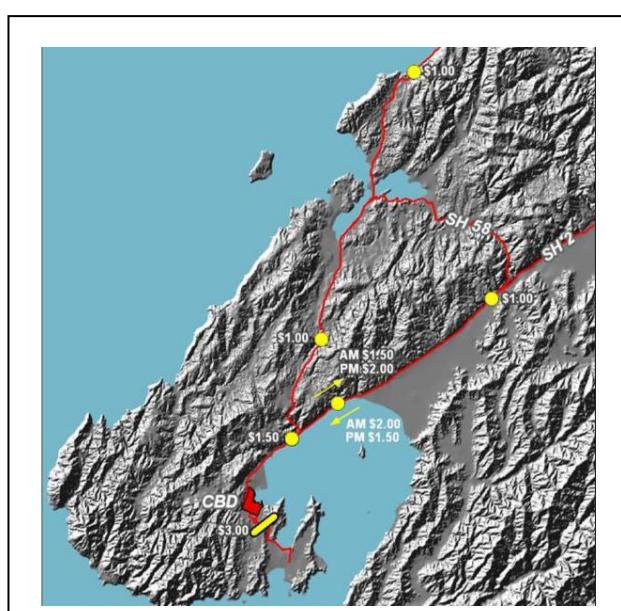
A 2007 study of road pricing in the Wellington region suggested that revenues, in the order of \$28 - \$38M per annum, were likely from tolls of between \$1 to \$4.50 across the motorway network (average payment estimated to be \$2.84). These costs did not take into account capital or financing costs. Capital costs were expected to be around \$40m.

This revenue was based on a "Y + South of CBD Screenline (YMS)" option. See Figure 8. Charges were to be paid at regular intervals across the motorway network, with modest tolls at several screenline points with counter-peak charges included on SH2 near Petone. It included charges on a southern screenline. This southern screenline is essentially the same as the southern part of the Wellington CBD cordon and runs from Oriental Bay, imposing charges on the Mt Victoria Tunnel, Adelaide Road, Taranaki Street and Brooklyn Rd.

Under the YMS scheme the majority of commuters (81%) would pay no charge because their trips do not pass through charging points. For example trips within the Paraparaumu, Upper Hutt, Porirua, Hutt or Wellington CBDs would not attract a charge.

The study found that with the YMS scheme, the most significant increases in passenger transport demand occurred on bus trips into the Wellington CBD from the southern suburbs, where over 1,000 additional trips would be generated in the morning two hour peak period.

Figure 8: 2008 "Y + South of CBD Screenline" option



The 2007 study noted a number of areas needing further investigations:

- Land use planning and regional growth effects, including reverse agglomeration (the degree to which the measures may provoke relocations, or boundary effects);
- Sector and social impact assessments: evidence on the effects that a congestion pricing scheme in Wellington would have on particular sectors and geographic areas; on employers and on people with no alternative time or mode of travel.

The 2007 Wellington study suggested the following benefits (key performance measure compared to no pricing):

- Congested VKT (VKT with V/C ratio >0.8) (AM peak) 39% reduction
- Average vehicle speed on the network (AM peak) 10% increase
- Average travel time on key routes inbound Wellington CBD (AM peak) 10% reduction
- Annual injury accidents 6% reduction.

Auckland

In 2008, the Ministry of Transport investigated road pricing in Auckland. Two different schemes were analysed - a scheme based on managing congestion in the central Isthmus area, the other focused on raising revenue, with some congestion benefits.

The congestion scheme involved a \$6 charge to cross over or move within a large central cordon area. That is, all trips that crossed the cordon, as well as all trips within the cordon, during the AM peak period, were charged. The annual net revenue in the first full year of operation was estimated to be approximately \$150 million (revenue of \$172m minus operating costs of \$19m, plus costs of \$2m for motorists installing transponders). Administration costs are therefore in the order of 12% of revenue.

The revenue scheme involved a lower charge than the congestion scheme (\$3), but the charge applied all day. The revenue scheme produced annual net revenue of \$97m, with total revenue of \$121m and operating costs of \$22m plus \$2m transponder costs for motorists. Thus administration costs were 20% of revenue.

Capital costs for the revenue scheme were estimated to be \$57.3m and \$87.8m for the congestion costs. The capex costs for the congestion scheme are higher because they involve many more stations to record traffic movements. No assumptions were made as to how these costs were to be financed.

The recent 2013 Keep Auckland Moving discussion document looks further at road pricing. It states that:

Road pricing could generate over \$250 million annually by 2031 at an average charge of around \$2 on key parts of the road network. Charges at this level also achieve significant travel benefits.

What is proposed is a network wide charge, involving the main motorway network. Hence revenue is higher than for the Ministry's "congestion scheme" modelled in 2008.

When asked if they supported tolling of motorways as one way to reduce congestion, 64% of Aucklanders said yes. This level of support was even across different household income ranges. A charge of around \$2 in the peak period was considered to be fair (although respondents were not told how much of a congestion benefit such a toll would deliver).

Other Examples

In London, the congestion charge has been in operation for 10 years. Transport for London reports that:

- All net revenue raised by the charge (£148m in financial year 2009/10) is invested in improving transport in London
- There has been a six per cent increase in bus passengers during charging hours
- Congestion has risen back to pre-charging levels but would be much worse without the charge
- Traffic management measures to help pedestrians and other road users have been able to be instigated.

In terms of effects on business activity, Transport for London last reported on business impacts in 2008. They concluded that overall, five years after the introduction of the charge there is no general evidence of any measurable differential impact from the central London congestion charging scheme on business and economic activity, at the aggregate level, based on analysis and surveys conducted by TfL.

Application of road pricing to Stockholm, covering a 47km area of the city, has reportedly led to a "20 per cent decrease in traffic, a 10-14 per cent decrease in emissions, a 2-10 per cent improvement in air quality, a decrease in the variability of travel times and the generation of a groundswell of support (70% of residents) for the system and its positive impacts on the city". Although revenue generation was not the primary objective, the funds generated through the introduction of the system (\$US120m) go towards the development of a new bypass.

4.5.5 Quantum of potential funding

For the purposes of this report, it was decided to investigate a CBD-based cordon charge. This was because the PTS project principally benefits access to the central city area.

GWRC used the WTSR to model a cordon based charge for trips passing through a CBD cordon. Two scenarios were used to understand the range of funding that is possible for a road pricing option (Table 27). The first scenario considered the AM peak period only, the second scenario addressed all weekday trips into the CBD.

Table 27: Road pricing scenarios

	Scenario 1	Scenario 2
Location of cordon	Same cordon used in the final 2007 SKM pricing study	
Charging period	Weekday AM peak, 7am to 9am	Weekday – all day i.e., AM Peak, Interpeak (9-4pm) and PM Peak (4-6pm)
Direction	Inbound only	Inbound only
Vehicle classes	All vehicle classes will have the same	All vehicle classes will have the same

	Scenario 1	Scenario 2
	same charge; in particular HCVs will have the same charge as cars and LCVs.	charge; in particular HCVs will have the same charge as cars and LCVs.
Charges tested	\$2, \$4, \$6	AM Peak – 100% of charge Rest of day – 50% of charge i.e. \$4/\$2, \$6/\$3, and \$8/\$4.
WTSM scenario tested	BRT and LRT scenario	BRT and LRT scenario
Administration costs	\$0.70 per transaction	\$0.70 per transaction

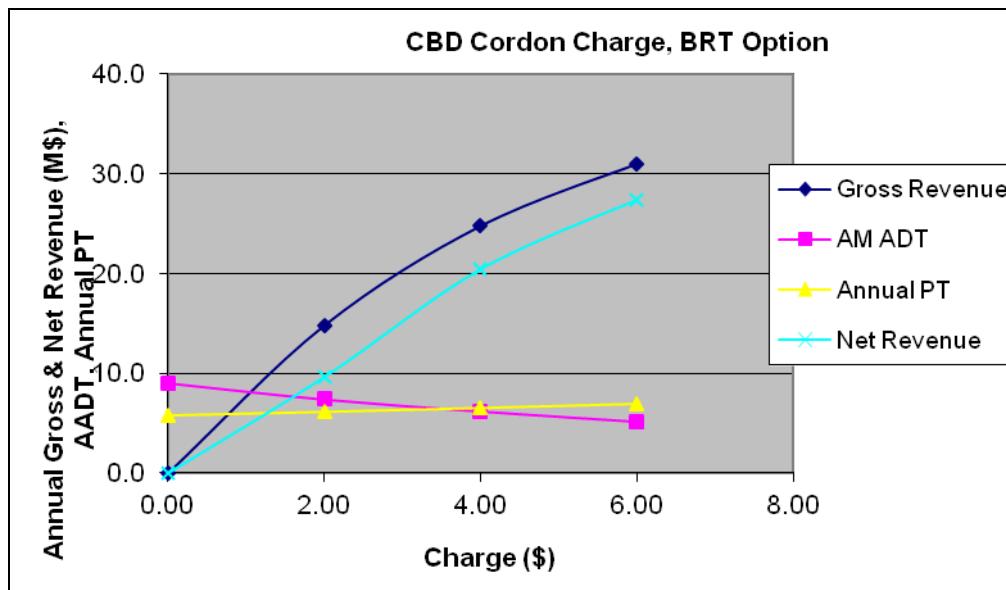
The main purpose of Scenario 1 (see Figure 9) is to capture inbound commuters; hence the charging period is limited to the AM peak and only captures commuter traffic once. It is noted that the size of the cordon potentially captures through traffic (as it includes Karo Drive). In the instance that the cordon was smaller to exclude Karo Drive then the total quantum of funding will be smaller.

There is very little difference between the BRT and LRT options. The amounts quoted below are taken from the BRT option for scenario 1.

- \$2 charge - \$9.6million/year
- \$4 - \$20.4 million/year
- \$6 - \$27.5 million/year.

Figure 7 shows how under the congestion charge, traffic levels start to fall off as the charge increases.

Figure 7: Scenario 1: AM peak cordon charge

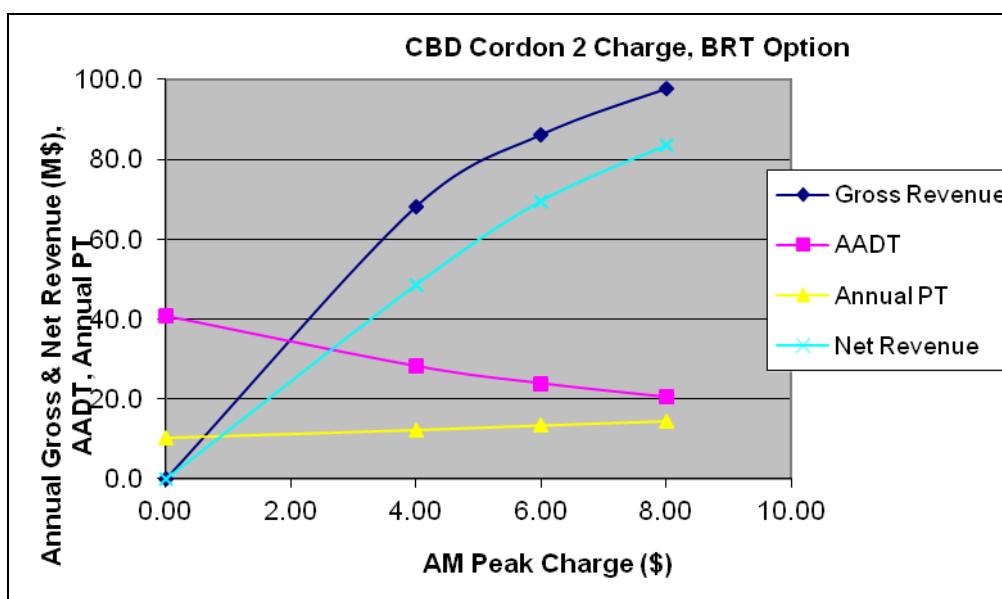


A charge of less than \$2 per AM peak trip would generate enough revenue to fund the BRT option.

Scenario 2 results in substantially more funding, showing the impact of capturing inter-peak trips, albeit at a lower rate:

- \$4/\$2 – \$48.5 million/year
- \$6/\$3 – \$69.5 million/year
- \$8/\$4 – \$83.4 million/year

Figure 10: Scenario 2: Cordon charge on inbound traffic in AM peak and 50% of AM cordon charge for all other inbound trips during rest of the day



Application of a cordon-based charge has the potential to raise significant revenues, as outlined above, but comes with a range of political and economic issues.

Generally road pricing schemes are economically positive, in that the charge reflects the additional cost that individual road users place on others when driving during busy periods. As a result of such targeted charges, those willing to pay the higher price do so (often business related, rather than commuting trips) and benefit from freer flowing traffic and quicker travel times. Those people who shift to public transport help support better quality services which in turn help to compensate for changed travel patterns.

However the above outcomes are dependent upon:

- Public transport services being in place to cope with the shift in demand. Generally Wellington has a good quality service that serves the main residential catchments, but improvements would be expected across the region, not just in the PTS catchments. Hence revenues would need to be spent across the region.

- Land uses remaining where they are and not shifting to avoid the charge. This may happen where the charge is applied to only part of a regional economy and businesses perceive the costs of the charge outweigh the benefits. Hence over time some businesses may shift, altering commuting patterns and with it congestion levels. This possibility is less in Wellington compared to more dispersed urban areas like Auckland, because of the geography of the region as well as economic make up (government sector), both of which concentrates economic activity in the central business area. However if the charge was perceived to unfairly affect sectors like the retail sector, then some relocation could be anticipated, and with it, inner city vitality.

4.5.6 Assessment against Evaluation Criteria

Table 28: Road pricing

Criteria	Assessment
Strategic Fit	Road pricing (cordon charge) should lead to improved regional outcomes in terms of a more effectively managed transport system and the economy through reduced congestion.
Acceptability/Feasibility	<p>Though 'tolling' is a commonly understood practice in NZ, the introduction of an inner city cordon such as proposed here is not common and will likely require strong political will to adopt.</p> <p>Retailers will oppose any moves to impose charges on potential customers entering CBD (especially as it acts as an additional charge on top of existing parking charges), so likely to receive greater acceptance if limited to AM Peak travel.</p> <p>Suburban businesses consider such a charge would encourage people to shop locally rather than travelling into CBD.</p> <p>Chamber of Commerce noted that they have supported the concept of tolling on motorways during peak traffic, but do not support this concept, or anything that is being used to fund public transport, rather than improvements to the road network.</p>
Effectiveness	<p>May result in traffic diversion as motorists use alternative routes to avoid the charge, shifting congestion onto smaller streets that have even less capacity to cope with higher traffic flows. Particular impacts on across town journeys.</p> <p>Relatively high administration costs compared to other transport-based options (e.g. transponders in cars, electronic recording equipment, payment and enforcement facilities).</p> <p>Will be a stable and reliable source of funding once in place.</p>
Efficiency	Road pricing is an effective means of more efficiently allocating scarce road resources than subsidising public transport or indirectly influencing travel behaviour through car parking controls. Costs should be outweighed by benefits to regional economy from reduced congestion.

Criteria	Assessment
Equity	<p>Tolls are generally considered equitable, because they charge users directly for the congestion costs they impose, but they are often criticised as unfair if they only apply to a few roadways.</p> <p>Lower income households may be unfairly penalised if PT alternatives are not adequate.</p>
Affordability	<p>An AM peak only charge is likely to be seen to be affordable at the lower end of the scale (e.g. \$2 per day).</p> <p>If road pricing adopted all day, it will disproportionately affect those people that travel across cordon boundary several times a day (e.g. suburban based business owners who travel frequently to see clients).</p>

4.5.7 Potential Risks and implications

Road pricing is seen by many as a more effective way to raise transport funds than petrol taxes or rates, as road pricing also sends a signal as to when not to use busy roads.

Currently, central government has expressed no desire to introduce road pricing.

4.6 Development contributions

4.6.1 Tool Description

Development contributions are a funding tool used by territorial local authorities to obtain (usually) monetary contributions towards the cost of providing core infrastructure for new growth.

Nationally, income from development contributions funds approximately four percent of capital expenditure nationwide. However the proportion does vary between councils, with some councils funding up to 50% of capital costs from development contributions.⁹

4.6.2 Responsible organisation

Any decision to use this tool to help off-set costs of new public transport infrastructure would need to be administered by the Wellington City Council. It can only collect development contributions for activities and services identified in its Long Term Plan.

4.6.3 Legislative Mandate

The Local Government Act 2002 enables local authorities to impose development contributions, giving local authorities a direct mechanism to fund asset costs caused by growth. Levied as money, land, or both money and land contributions may be charged on any development, such as a subdivision that generates a demand for reserves, network infrastructure (roads and transport,

⁹ Department of Internal Affairs (2013) Development Contributions Review. Wellington.

water, and wastewater and storm water collection and management), or community infrastructure (land and public amenities).

4.6.4 Overview

In determining development contributions, a local authority needs to make judgements in several areas. A local authority needs to:

- Consider whether it will impose development contributions as part of its overall revenue and financing policy. The use or non-use of development contributions as a funding source is a funding decision that needs to be considered and explained in terms of section 101(3) of the Act, which includes the equitable allocation of responsibility for funding throughout the asset's useful life, whether all or only a part of the community benefits, and the extent to which the actions or inactions of particular people have contributed to the funding need;
- Identify the expected growth within the district or city. In many instances, this has resulted in local authorities identifying different pockets of growth for different townships or locations within their boundaries;
- Determine what assets are required in full or in part because of growth. This requires it to consider the existing capacity and location of its infrastructure compared to the areas where growth is expected and increased capacity resulting from the growth will be needed;
- Define what the relevant asset costs include, for both future assets and assets that have already been completed;
- Develop an appropriate methodology for differentiating between costs caused by growth and other costs. This is especially difficult where a new asset is required and only a portion of that need is attributable to growth. The Act does not provide guidance as to whether costs should be pro-rated or apportioned on a marginal costing basis in assessing this split; and
- Calculate the contributions payable, including whether the local authority should set them by location or on a city-wide or district-wide basis.

4.6.5 Other research on development contributions

A NZTA report on Value Capture Mechanisms (NZTA 2013) provides a useful update on how development contributions are applied in New Zealand. Some key points from that report relevant to public transportation projects are included below:

- Development contributions are the predominant mechanism used to fund infrastructure required by new growth. Even so, development contributions are not used consistently between councils.
- Development contributions are easiest to apply to greenfield developments, more complicated for brownfield developments (where it is difficult to show what portion of a development is new growth rather than just capacity upgrades) and even more difficult to apply to public transportation projects.

- Noting that development contributions can only be imposed by territorial local authorities, a regional council would need to work closely with a TLA to determine how development contributions would be collected and for what. Development contributions can only be used for capital projects that are included in a TLA's Long Term Plan, which raises the question as to who the asset owner will be for various aspects of the PT network.

4.6.6 How development contributions currently applied in Wellington

Section 201(1)(a) of the Local Government Act 2002 requires council's to prepare a Policy to include, in summary form, an explanation of and justification for the way each development contribution is calculated.

In calculating their development contributions, Wellington City's Policy says that they followed the process outlined:

1. Define catchments
2. Identify 10-year capital expenditure resulting from growth. Growth is one of three components of the total 10-year capital costs budgeted in the LTCCP, the other two components being level of service improvements and renewals. These two costs must be met from funding sources other than development contributions.
3. Identify the percentage of growth related 10-year capital expenditure to be funded by development contributions
4. Identify the appropriate units of demand
5. Identify the designed capacity (in units of demand) provided for growth
6. Allocate the costs to each unit of demand for growth.

Wellington City Council development contributions policy sets out total capital expenditure of \$187,776,482 on traffic and roading, based on the Council's 2009/2019 LTP. Of this, \$18,506,776 or about 10% is identified as "growth related". Of this growth component, \$5,522,570 is funded by other sources, leaving \$12,984,206 to be funded by new development, spread across 15,236 equivalent household units. This translates into \$835 per household equivalent unit.

Thus development contributions will fund around about 7% of capital expenditure over the next 10 years.

Additional contributions can apply in specific areas. One such area is the Adelaide Road precinct where an additional \$3,856 is levied to support a variety of projects that were identified as part of the Adelaide Road Framework. The following breakdown is provided:

Table 29: Adelaide Road development contributions

Adelaide Road Project Planned capital expenditure	NZTA Subsidy Proportion relating to catchment	Proportion relating to corridor	Proportion relating to growth	EHUs	Development contribution per EHU
\$19,381,337	\$8,364,413	\$4,070,081	\$2,313,554	600	\$3,856

Growth related costs in this case are therefore assessed to be 12% of the total.

The council's policy notes that while many of the key outcomes for Adelaide Road are locally focused (such as providing for more high-quality residential growth, recognising and protecting employment opportunities while enabling a transition to suitable 'new economy' activities and strengthening the local community) there is also a strong emphasis on improving the Adelaide Road transport corridor for multiple forms of transport.

Accordingly, for the purposes of calculating development contributions, the council considered that the benefits to the local community should be the same, in aggregate, to the benefits to the wider community. The benefits to the wider growth community have been assessed on a citywide basis for two key reasons:

- There are key citywide destinations south of Adelaide Road, in particular the hospital. All of Wellington will benefit, for example, from quicker ambulance access to Wellington Hospital
- Allocating the costs on a citywide basis is consistent with the approach to other similar roading projects.

The Adelaide Road development contribution has been in place since 1 July 2009, but the effects of the global financial crisis and the nature of the highly fragmented ownership along Adelaide Road has meant that, to date, there has been little redevelopment of this area. In addition, funding for some roading projects identified for this area (as identified under the 2008 Adelaide Road Framework) has not become available and the council has been required to reduce the scope of its capital investment in this area.

As a comparison, in Auckland, the transport related contribution in the main urban catchment of the city is \$3,520 per unit of demand, and for public transport, \$1,449. The transport specific contributions are just one of a number of contributions that total between \$20,000 and \$25,000 per new home in the urban part of Auckland.

In Auckland, capital expenditure for public transport expected to be incurred to meet growth demand is estimated at \$264 million. This includes capacity to provide for demand beyond the 2012/22 long term plan period. Total amount of funding during the long-term plan period to be sought from DCs is \$155.6m.

Looking at the Council's draft LTP show how development contributions are expected to fund only a very small proportion of the cost of the city's rail expansion proposals.

Table 30: Auckland Council rail based capex

10 year expenditure / revenue	\$ (m)
Rail capex	\$4,038m
Total public transport capex	\$4,288m
growth related capex	\$ 199m
Development contributions	\$ 160m

In this case development contributions are expected to fund only about 4% of the total capital costs. This is due to the bulk of the costs being assessed as improved levels of service that benefit current and future generations, rather than growth related costs.

Tauranga City has a higher recovery rate for growth. For example, for the Papamoa area, total capital expenditure on roading is estimated at \$59,142,957, of which \$29,277,451 is to be sourced from development contributions (i.e., 50% of future capital expenditure).

4.6.7 Quantum of potential funding

For this study, a conservative estimate of the growth component of the project has been used. Based on the household estimates set out in Appendix Four, growth between 2011 and 2031 will add just over 20% to the population of the corridor and catchments, and as a result this has been adopted as an estimate of growth-related expenditure. The bulk of costs (80%) are therefore assumed to be made up of improved levels of service and infrastructure renewals.

The following assumptions have been made:

- Capital expenditure (as agreed to be taken on by WCC within their LTP) does not include costs of the vehicles (ownership of which is still to be determined).
- Timeframe is 2011-2031
- 50% of the total project costs are assumed to be sourced from other funds.
- 20% of costs are 'growth related'.
- Residential and Non-residential EHUs based on expected change in the number of households and employees in the outer corridor (between 2011 and 2031). 2.5 employees are assumed to form an EHU.

Overall, based on the above assumptions, development contributions are assumed to be able to fund about 10% of the project's total capital expenditure. This is not dissimilar to WCC's current contribution rate for transport projects in the city.

In the case of the PTS the split between growth related costs and costs associated with improved levels of service are not clear cut. The options do not significantly lift patronage levels suggesting that there are limited growth benefits, but the BRT/LRT options do provide long term capacity.

Table 31: Development contributions estimate

Step	BRT	LRT
Total capex (\$m)	\$213m	\$932m
Infrastructure related costs	\$199	\$814
Other sources of funding	50%	50%
Net amount	\$99.6m	\$406.8m
Portion Growth related	20%	20%
Growth related capex \$M	\$19.92	\$81.36
Proportion of total capex	9%	9%
EHU	9100	9100
Per EHU	\$ 2,189.01	\$ 8,940.66

This estimate results in funding of \$19m for the BRT and \$80m for the LRT. This funding will be spread over a 20 year period, dependent upon growth rates. If growth speeds up and is faster

and greater than expected, then additional revenue may be gathered, but if it is slower and not of the scale anticipated, then revenue will be lower.

4.6.8 Assessment against Evaluation Criteria

Table 32: Development Contributions

Criteria	Assessment
Strategic Fit	Fits with current WCC development contributions approach, however it could work against the objectives of the WCC Urban Development Strategy by discouraging redevelopment within the Growth Spine area.
Acceptability/Feasibility	<p>Strong resistance from stakeholders on this option. Could act to stymie new development. Already reluctance to redevelop at present in suburban town centres (given current market conditions) so this is unlikely to help encourage further development in these areas. May force small scale redevelopment in particular to 'go underground' (i.e. built without consent).</p> <p>Viewed by some as a double tax and therefore vehemently opposed.</p> <p>Development contributions targeted to the corridor could result in new investment being transferred to areas where there is no additional development contribution, resulting in development occurring in areas that may not be desirable (i.e. urban sprawl) or which do not work to support broader urban development goals (such as transit orientated development).</p> <p>Increases overall costs of development which may be passed on to purchasers and tenants (via rental agreements) affecting affordability of housing and/or business viability.</p> <p>Government review of development contributions regime may change regime as it is presently known. Uncertainty around possible future changes, combined with low level of public acceptability, and low level of funding generated makes this option less favourable.</p>
Effectiveness	Relies on good economic conditions supporting new development. Broad assumptions required to calculate development contribution may mean final revenue generated may be large. Adelaide Road Precinct development contribution is evidence that this source is unreliable, as development pressures have not been as strong as expected.
Efficiency	To the degree that new development increases demand for public transit, and that development benefits from higher quality transit service, it can be considered efficient, but if the contribution regime means that development is discouraged from locating in the corridor and goes to less beneficial areas (in city-wide terms), then inefficient allocation of resources may arise.
Equity	<p>Significant uncertainty around the extent of benefits that will occur, so question whether a targeted development contribution appropriate and fair.</p> <p>Places financial burden on new development only, rather than existing development (which would also share in any actual benefits).</p>

Criteria	Assessment
Affordability	May make new housing more unaffordable than at present, restricting the type of households that can purchase housing in areas close to public transport spine. There is a need to make housing along the PTS more accessible to all household types to ensure all social-economic groups have high levels accessibility.

4.6.9 Potential Risks and implications

Two key risks have been identified for this tool.

Firstly, the Department of Internal Affairs has issued a discussion document on possible changes to development contribution provisions of the Local Government Act (DIA, 2013). This review signals intent to overhaul the development contributions regime. The aim of the review is to address 10 key issues that have been identified with the development contributions regime. Of particular relevance to this study are the following options:

- Option 3: Explicit discounts enabled for housing of a type and location that creates less demand for services
- Option 5: Facilitating increased private provision of infrastructure through enhanced developer agreements
- Option 6. Tightening the range of infrastructure that can be funded from development contributions
- Option 8: Capping of development contributions at a set dollar amount
- Option 13: Abolition of development contributions as a financing tool.

This policy review represents a risk to the use of development contributions as a potential funding source. This is because any one of the policy options identified above could affect the ability to collect any development contributions at all for a public transport project, or at the least notably reduce the quantum of funding able to be collected.

Secondly, this tool relies on predicted growth actually occurring. Development activity in Wellington does tend to happen in cycles, and at present due to the global financial crisis, Wellington is experiencing low levels of development. Also, as noted above the Adelaide Road development contribution has been in place for a number of years, but has collected very little money due to the low level of development in that area. It is uncertain when the next substantial rise in development activity will begin.

4.7 Land Values and Value Capture

4.7.1 Tool Description

Value capture can be divided into two sub groups:

- Capture of betterment - the land value rise is directly caused by a specific action related to physical development, such as a transport investment that improves accessibility.

- Capture of the unearned increment – the land value rise is not linked to a specific infrastructure action, but rather to general changes in policy, such as land use rezoning or issuing of resource consent which increase the development potential of the land, or reduces the development potential of competitors.

This value increase may be “recaptured” by a number of direct and indirect means. Direct means include a one off levy recouping part of the increase over a set period of time, such as upon sale, or upon rezoning or development that has the effect of raising land values.

Indirect means may involve development agreements, or the application of planning gain (as used in the UK). Council involvement in the land development process, such as via land banking is a further option. Tax increment financing is also recognised as an indirect means of recouping increased value. It is a technique common in America.

In designing any value capture mechanism, it is important to ensure that the recapture of land value is not at such a rate that it becomes a disincentive to development. In other words, it should only be levied once land values have risen, for example, and redevelopment is underway. The main issue with land value uplift is the difficulties of relating investment in infrastructure to a rise in land values, given other factors affecting land values in play at the same time (demand, general economic conditions, development financing etc), and the uncertainty if the value uplift will eventuate, if payment is delayed. For example the project may commence at a time of economic growth, but be completed when there is an economic recession, and land values have gone down, rather than up as a result.

Key assumptions relate to:

- Area of ‘direct benefit’ needs to be identified
- Identify expected rates of uplift based on land use trends in the area
- Identify proportion of value uplift that will be publicly acceptable as being ‘taxed’
- Determine when and how the uplift is to be recaptured.

For the purposes of this report, a conservative estimate of land value uplift has been taken. This reflects the limited overall regional transport benefits of the PT Spine project, as well as the modest growth levels within the region, as well as the corridor.

4.7.2 Responsible organisation

The Greater Wellington Regional Council would set the land value capture ‘rate’.

4.7.3 Legislative mandate

None.

4.7.4 Examples of value capture

There is a growing body of literature that cites the correlation between increased property prices and improved public transport systems. However this relationship is not clear cut.

Both negative and positive results have been attributed to transit provision, with some studies giving statistically significant evidence of residential property price increases of up to 25 percent (as cited in Grimes, A. and Young, C. 2010).

Appendix Six lists out a range of studies on public transport investment and land values. This table was presented in the 2008 evaluation of the Gold Coast Light Rail scheme.

The AECOM 2012 report for the PTS project detailing the international review of public transport systems noted these correlations, and cited the following examples:

- Brisbane South East Busway: Up to 20% gain in property values near busway. Property values in areas within 6 miles of station grew two to three times faster than those at greater distances. Higher increase in median home values around busway than other suburban areas.
- Beijing's Southern Axis BRT, opened in 2004: estimated value uplift 10-25% of land near the corridor. For residential property, an average increase of 2.3% occurred between 2004 and 2009 within the 500m radius of the BRT.
- Bogota, Colombia: estimated value uplift of between 6.8% and 9.3% for every five minutes of walking time to the BRT station.

As a result of their review, AECOM concluded that:

- 'Bus on street': little attraction of new development investment as a result of this form of public transport service
- BRT: property prices rise by up to 20% when compared to surrounding suburbs
- LRT (and mass rapid transit): property price increases up to 25%.

Further, in a NZTA report on value capture mechanisms (NZTA 2013), the authors referred to studies in North America that have shown a strong relationship between the impact on land value and public transport investment. The impact ranges from a 5–10% increase on residential values, to a 13–30% increase on commercial properties within close proximity to the infrastructure.

In relation to impacts on suburbs of different socio-economic make up, a study of Tyne and Wear (UK) showed that in the poorer areas of that city, savings in public transport accessibility of one minute gave a bigger percentage change to house prices (up to 6 percent, as compared to the global average of 1.2 percent), than compared to wealthier suburbs. This reflects the way in which public transport accessibility is likely to be more important to households with lower incomes, especially where car ownership is relatively low.

The one New Zealand study that has looked at property price responses to investment in public transport is a study of the Western rail line in Auckland, called: "Anticipatory Effects of Rail Upgrades: Auckland's Western Line". Arthur Grimes & Chris Young, Motu Working Paper 10-11, Motu Economic and Public Policy Research, September 2010".

This study analysed whether houses near western line stations showed any positive announcement effect when the western line upgrades and New Lynn redevelopment were announced in mid-2005. In order to estimate whether such an effect occurred, the study controlled all other factors affecting house prices. The finding of the analysis was that property values rose \$605 million to \$667 million upon announcement in 2005 of the upgrades (using 2004 values). These benefits are broadly comparable to the costs ascribed to the Western line upgrades pertaining to Waitakere City (including the New Lynn projects costs).

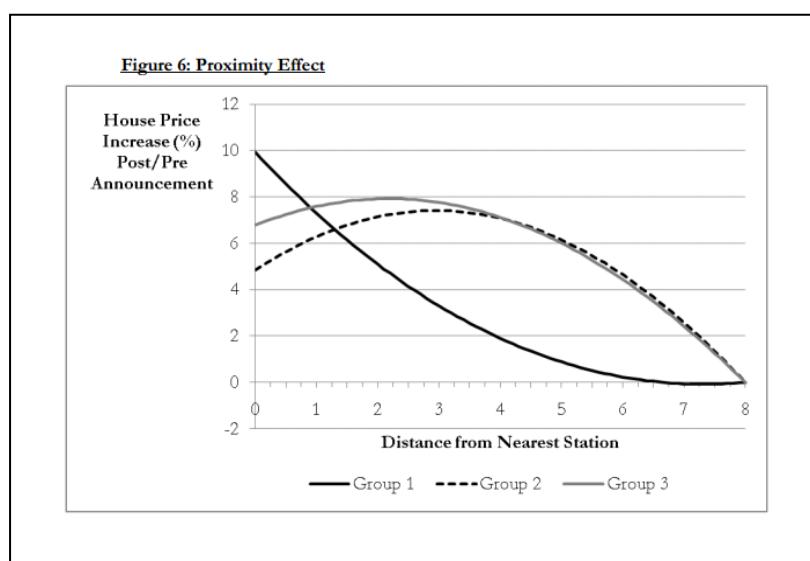
The magnitudes of the rises were sensitive to which station the houses were located nearest. Houses more distant from the rail track also rose, but by decreasing amounts up to a distance of around 8 kilometres from the station, at which point no rise was apparent.

The study noted that residents in houses within a kilometre or so of the station may anticipate a benefit directly by walking to a station that will offer an improved service once double tracking is complete in late 2010. However they may also suffer from increased train noise and from negative effects of increased station patronage. Residents beyond this distance may benefit in multiple ways. First, they may drive to the station and then utilise a “park and ride” facility and thence commute by train. Second, they may take other public transport (bus) to a station and then catch the train. Third, they may anticipate reduced congestion on major roads as others switch to the train and so have enhanced transport connectivity even if they never catch a train. The latter group may be amongst those living further from a train station (up to eight kilometres distant) who nevertheless benefit from the rail upgrades.

For the study, eight stations within Waitakere City that are affected by the upgrades were selected. The report notes that given their geographical locations, they form three relatively distinct groups. The New Lynn, Fruitvale Rd and Glen Eden stations form one group; the Sunnyvale, Henderson and Sturges Rd stations form another group; and Ranui and Swanson stations form the third group. The first group of stations is closest to the city centre and the urban redevelopment at New Lynn, while the second is slightly further out and based around the town centre of Henderson; the third group includes the stations most distant from the Auckland CBD.

Figure 11 from the study shows the relationship of property value increases and distance from the station, for the three different station groups. In the New Lynn group, values where higher closest to the stations, reflecting, the commercial zonings in place and the recent “transit-orientated” development enabled by that zoning, with property price increases of 10% close to the line. In the other two cases, the highest increase is approximately 1 to 2kms from the rail corridor, where an 8% rise was found to occur.

Figure 11: Relationship of property values to distance from station



All of the studies on land use and transport note that due to differences in the ‘background’ circumstances supporting public transportation projects, the link with land values is not clear-cut. Some general principles, however, have been recognised that are relevant:

- Improvements to transport accessibility: The literature indicates that public transport projects which are substantial in scale and which significantly improve transport accessibility, relative to other areas, have a positive impact on local property values. Impacts are more easily identified for tram and metro investments than for bus investments and most of the research has concentrated on urban rail systems.
- Commercial land users: Corridors with a large component of commercial uses tend to see positive movements in land values more so than residentially focused areas. This is because businesses are more likely to pay a premium for the increased accessibility. Depending on the investment, residential impacts could extend to 1,000m, whilst those for commercial developments are likely to be concentrated in a 400m radius
- Growth opportunities: transport projects cannot (by themselves) turn around an area in decline, however they can help to speed up the pace at which areas are developing, provided that there are development opportunities available and supportive land use policies in place.

4.7.5 BRT versus LRT

It is noted that LRT (and mass rapid transit systems in general) are more likely to result in property price increases compared with conventional bus systems, as there is more certainty around LRT routes as it is a fixed system and not able to be changed as easily as conventional bus systems. BRT responses are more variable.

LRT benefits tend to be concentrated close to the actual transit corridor (within 400m to 800m walking distance). In contrast bus-based rapid transit benefits tend to get more widely spread, reflecting the ability of bus services to exit the rapid transit network and enter the local street network.

The Brisbane South East Busway is often cited as an example where property prices near the busway gained 20%. This busway was opened in 2000. A report on bus rapid transit systems (TCRP Report 90) listed the following property-related data. The TCRP report says it is sourced from the Real Estate Institute of Queensland, but no further details on timeframes, sample sizes or other parameters are available.

Table 33: Effect of Brisbane Busway on Property Values

Station	Property within 5 to 10km of the Busway	Suburb	Increase beyond 10km of Busway
Holland Park West	+20.86%	Holland Park	+6.23%
Upper Mount Gravatt	+8.29%	Mount Gravatt East	+4.76%
Eight Mile Plain	+3.93%		+1.56%

The data from Brisbane shows how land value uplift is variable between stations, meaning local conditions are very important in determining responses. Between the three stations, the average uplift is 10%.

The data also shows how uplift from a busway can be wide spread, extending well beyond the immediate corridor. In the case of Brisbane, this may reflect the fact that the busway follows a motorway, and as a result properties close to the motorway may suffer a penalty for their proximity to that facility.

There is also some evidence that the scale of public investment also influences land use responses, with one view being that “the bigger the project” the more likely it was that a council would back up that investment in actions that support it, such as not upgrading competing transport routes and restricting land use opportunities elsewhere so as to encourage growth to locate in the area served by the new investment. As busway systems involve less capital and involve more flexible transport networks (competing services do not have to use busways) compared to LRT systems, then land use responses to BRT systems may also be more limited due to perceptions.

4.7.6 Quantum of potential funding

Table 34 below shows the total land value for the inner corridor (i.e. the core CBD area), the rest of the corridor, and the eastern and southern catchments of the PT spine, as held by GWRC. Note this data is for valuation purposes and does not represent market value.

Table 34: Total land value for identified areas in the study area

Area	Total no. of properties	Total LV	Share of total
Inner Corridor	12711	\$ 5,512,956,507	42%
Outer Corridor	10501	\$ 3,548,026,750	27%
East Catchment	8744	\$ 2,738,942,000	21%
South Catchment	5351	\$ 1,250,701,900	10%
Total	37307	\$ 13,050,627,157	100%

Table 35 takes the land values in Table 34 and makes an assumption as to how much is commercial and how much is residential. This is necessary, as the GWRC does not hold data on the use of properties, only by location.

Table 35: Estimated commercial / residential split

	Commercial	Residential	Commercial	Residential
Inner Corridor	80%	20%	\$ 4,410,365,206	\$ 1,102,591,301
Rest of Corridor	30%	70%	\$ 1,064,408,025	\$ 2,483,618,725
East Catchment	10%	90%	\$ 273,894,200	\$ 2,465,047,800
South Catchment	10%	90%	\$ 125,070,190	\$ 1,125,631,710

For the purposes of developing a scenario as to what may be possible in terms of uplift, Table 36 then sets out the assumptions as to possible land value uplift, for the two different options. The percentage uplift has been reduced from that reported in the literature above. This reflects the

particular circumstances of the corridor and catchments, as well as the wider regional economy. Relevant points are:

- The PTS options see modest increases in transport accessibility. For example, from Newton, travel times by BRT / LRT drop by around 7 minutes, a 30% reduction compared to the current situation. In effect, Newtown will have the transport accessibility to the CBD currently enjoyed by the Adelaide Road area
- Regional economic growth rates are subdued at the moment, and so there is less pressure overall for development and redevelopment
- Out of the CBD and the Adelaide Road areas, redevelopment opportunities are constrained by character, amenity and heritage issues.

The estimates presented in Table 36 represent a scenario, in that no detailed estimate of land value uplift has been undertaken. Any assessment prior to the project being undertaken can only rely upon the examples cited in the literature. Useful pointers are:

- The study of transport investments along the Western Rail Line in Auckland provides one useful local guide as to what may happen, in that property values rose by 6 to 8%, reflecting (possibly by coincidence), the rough estimate of the cost of the project.
- The data on house prices in the Wellington city area in Appendix Four suggests that for every 1km houses are closer to the CBD, then prices rise on average by \$15,000, or about 3%. In theory, travel time savings should be capitalised into house prices, as less money spent in travel means more money can be spent on the mortgage/rent.

For the BRT option, it is assumed that the main benefit is felt in the outer lying suburbs, while for the LRT option, benefits are more concentrated along the corridor itself, with more of a benefit to commercial activities along the route.

Under the BRT option, values in the catchment are assumed to increase by 5% more than they otherwise would. Coupled with the outer lying suburbs being desirable living environments, it is reasonable to assume an increase of up to 5%, well below other cited evidence (such as Brisbane which recorded increases of up to 20% along the busway). For the corridor, a more modest 3% increase has been assumed, given that the BRT effectively represents an improved level of service, rather than a significant step up in passenger transport accessibility.

For LRT, a much greater emphasis is placed on commercial rather than residential land value uplift. In particular the corridor from Newtown into the CBD may experience a lift in accessibility and profile with LRT. The core CBD area is not likely to see a major lift, as land values in this area will already be heavily influenced by the region's passenger transport system. However, the southern part of the central area will be better connected to the rest of the CBD and the regional passenger transport network with LRT in place, and this may be the spur for some relocation of activities from the core CBD into the fringe areas, as well as attracting new business activities looking for accessible premises, but not involving the high rents of the CBD area. As a result of a small percentage increase has been assumed (2.5%) over a large base, although in effect this increase would likely be concentrated in a specific sector (e.g. Te Aro valley).

The uplift in the corridor is also likely to reflect the "image" change associated with LRT, as well as the potential for local environmental improvements that seek to build on reductions in traffic volumes.

Table 36: Assumed land value uplift - BRT versus LRT

	Commercial	Residential
BRT		
Inner Corridor	0%	0%
Rest of Corridor	0%	5%
East Catchment	0%	3%
South Catchment	0%	3%
Total		
LRT		
	Commercial	Residential
Inner Corridor	2.5%	0%
Rest of Corridor	5%	3%
East Catchment	0%	0%
South Catchment	0%	0%

Applying the above percentage increases to the land values in Table 34 results in the figures set out in Table 37.

Table 37: Land value uplift \$M

Area	Commercial	Residential	Total
BRT			
Inner Corridor			
Rest of Corridor		\$124m	\$124m
East Catchment		\$73m	\$73m
South Catchment		\$33m	\$33m
Total			\$231m
LRT			
	Commercial	Residential	
Inner Corridor	\$110m		\$110m
Rest of Corridor	\$53m	\$74m	\$127m
East Catchment			
South Catchment			
Total			\$237m

The \$240m uplift under the BRT option roughly matches the expected transport benefits (\$8m per year, for 30 years). It is also close to the estimated cost of \$200m.

The LRT uplift exceeds the expected overall transport benefits of this option and is much less than the estimated cost. The amount of uplift is similar to the BRT, but the weight is towards the commercial sector, rather than the residential sector.

The next assumption is to determine what a reasonable recapture rate would be; that is how much of the land value uplift could reasonably be recouped. Too high a recapture rate, and the

incentive for landowners to redevelop their sites will diminish, and rather than be a catalyst for redevelopment, the PT spine would instead be an area of disinvestment.

Table 38 sets out a 20%, 33% and 50% recapture rate, assuming that 80% of properties would be “caught” in the uplift recapture net. The 80% figure recognises that some properties will not sell within a reasonable timeframe and therefore not be subject to a one off charge on increased value.

Table 38: Potential revenue, based on different recapture rates

Option	20%	33%	50%
BRT	\$37m	\$61m	\$92m
LRT	\$38m	\$62m	\$95m

If the uplift is recouped over a 10 year period, for example upon first sale of property after the project has been commissioned, then assuming an even spread of sales, the following annual revenue streams can be estimated (see Table 39).

Table 39: Possible annual revenue

Option	20%	33%	50%
	\$3.5m	\$6m	\$9m

Under the LRT option, more of this increase is sourced from the commercial sector than under the BRT option.

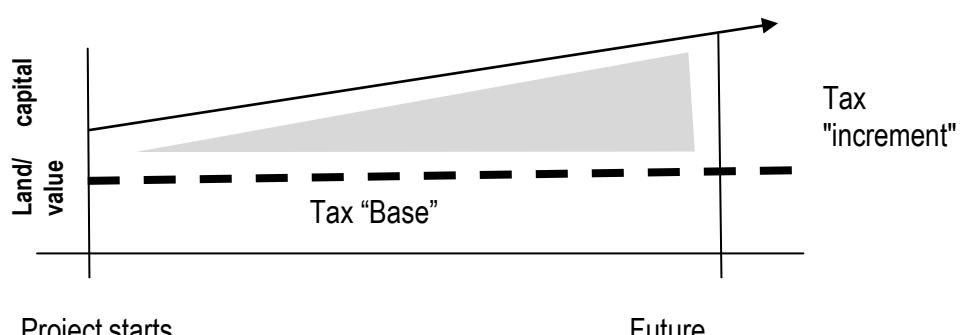
A recapture rate around the 20% to 33% mark is more realistic than 50%.

There is no certainty that the above revenue will be recouped. Property prices might decline over the period due to wider economic factors, such as a prolonged economic down turn. Property sales may be deferred or not occur if property owners perceive the uplift tax to be unfair and/or unreasonable.

4.7.7 Rates Increment

Instead of a one-off charge, a targeted rate could be set to capture part of the value increase. For example if it is assumed that the project will lead to increases in capital values, then the increase in capital value for a particular area could be identified and the additional rates revenue from this increase set aside to help fund the infrastructure that is the cause of the uplift. This is called tax increment financing in America. Figure 12 shows how this tool can be conceptualised.

Figure 12: Conceptualisation of tax increment financing



It is normal practice in New Zealand for the rate in the dollar to be lowered as rateable values overall increase. That is, councils funding requirement are set and as rateable values increase, then rather raise more revenue, the rate per dollar is reduced so the same amount of funding is obtained from the larger combined total rateable value. This is on a city-wide basis. Relative increases in one suburb compared to another result in variations across the city or region.

In the case of tax increment financing, for a defined area, the rate in the dollar is not reduced, with the rates income growing as the areas rateable value increases. It is common in America for tax increment financing to be applied to "declared projects", that is a specific area often subject to urban decay is defined, and the additional revenues from rising values are ring fenced to help pay off loans raised to pay for capital investment in the area. Such funding arrangements are not without risk - values may not rise as predicted, while the ring fenced income is not available to fund other services and activities in the area.

Taking the above example of the LRT option, if the increase in land values is translated into increases in capital values (based on the current ratio of land value to capital value of around 2.2), then total capital values in the corridor may rise by more than \$716m than they otherwise would, over a period of time. If that \$716m increase was subject to the current regional transport and general rate, then there is an associated revenue stream. This revenue would build up over time, as land and capital values increase up to the new level.

The principle of tax increment financing is that this increment in rates income is set aside and used to fund the infrastructure upgrades in the area. The increment financing could be kept in place for a period of time, such as 15 or 20 years, after which it is removed.

While there is no explicit legal mandate for tax increment financing in New Zealand, an area-based targeted rate could be constructed which has the same outcome.

Table 40 sets out the calculation of increases in capital value, based on the land value increase assumptions set out in the section above. This increase in capital values implies that the land value increase spurs redevelopment in the corridor area. This is an uncertain assumption. Demand for new dwellings is obviously an important factor, while in the commercial sector increased rents for shops and offices would need to be experienced to spur redevelopment. As discussed, the LRT option is likely to have more of a simulative effect than the BRT option in this regard.

Table 40: Possible increase in capital values under BRT option

Area	Current	Increase	New Total	Capital Value
Inner Corridor	\$5,512,956,507	\$110,259,130	\$5,623,215,637	\$13,424,798,456
Rest of Corridor	\$3,548,026,750	\$204,011,538	\$3,752,038,288	\$8,330,457,572
East Catchment	\$2,738,942,000		\$2,738,942,000	\$5,619,407,000
South Catchment	\$1,250,701,900		\$1,250,701,900	\$2,823,830,400
Rest of city	\$10,750,830,001		\$10,750,830,001	\$24,554,563,001
Total	\$23,801,457,158		\$24,115,727,826	\$54,753,056,429

Table 41 takes the above increases in capital value and sets out the difference as to current CV levels. The time period over which these increases may occur is unknown. Table 42 then applies

the current combined regional general and regional transport rate to this increase, and from this, the expected additional annual revenue.

Table 41: Possible change in capital value

Sector	Current CV (\$m)	Projected CV (\$m)	Change (\$m)
Inner Corridor	\$13,162	\$13,425	\$263
Rest of Corridor	\$7,878	\$8,330	\$453
East Catchment	\$5,619	\$5,619	\$0
South Catchment	\$2,824	\$2,824	\$0
Rest of city	\$24,555	\$24,555	\$0
Total	\$54,037	\$54,753	\$716

Table 42: Possible additional rates income

	Change in rateable value (\$M)	Rate (cents in the dollar)	Annual Revenue
Inner Corridor	\$263 million	0.26522	\$ 698,100
Outer Corridor	\$452 million	0.05653	\$ 256,100

4.7.8 Assessment against evaluation criteria

Table 43: Land Value Capture

Criteria	Assessment
Strategic Fit	May be seen as counter to Wellington City's policy approach to increase development intensity and mix along the PTS corridor.
Acceptability/Feasibility	No legal mandate. Notable reluctance from business stakeholders. Viewed as a 'double tax'. Retailers uncertain that land values will increase as a result of public transport improvements. Increased land values will increase business costs (i.e. rent) but not certain business income will increase accordingly.
Effectiveness	Revenue very uncertain and will only be able to be determined post construction and operation of the PTS. Revenue from one-off charge is likely to be very lumpy (vary from year to year) depending upon extent of property sales activity Significant resources are likely to have to be put into establishing process / criteria to determine extent of uplift May discourage some transit-oriented development.
Efficiency	A land value based tax is generally seen to be an efficient way of recognising betterment arising from public investment and actions, and more efficient than, for example, impost on additional income arising from increased values. In addition, by constraining development opportunities, zoning creates a scarcity

	effect, raising land values. Some of this increase can be recaptured to enable public improvement in an area.
Equity	Reasonably equitable as any tax imposed on property owners should reflect increased values arising from public actions. However, may make housing developments along transport corridor less affordable, affecting transport accessibility for lower-income people.
Affordability	Depends on how the tax is structured and development conditions. It captures value from developers and property owners, but some of the tax may be passed on to residents, and it can reduce housing affordability in transit-oriented developments, which is regressive. To be affordable, value recapture would need to be tied to first sale of property after a set date, e.g. after the PTS being in operation for 3 to 5 years.

4.7.9 Potential risks and implications

Value capture, while theoretically sound, presents a major methodological hurdle in terms of being able to distinguish between the different drivers of value increase.

Being a new tool, any method to determine value increase will be strongly debated.

Any value capture tax would be applied post commissioning of the PTS. There is potential for land values to decrease, or not increase at all if the wider regional economy stagnates. This makes any revenue stream uncertain.

4.7.10 Recapture through land development / air rights

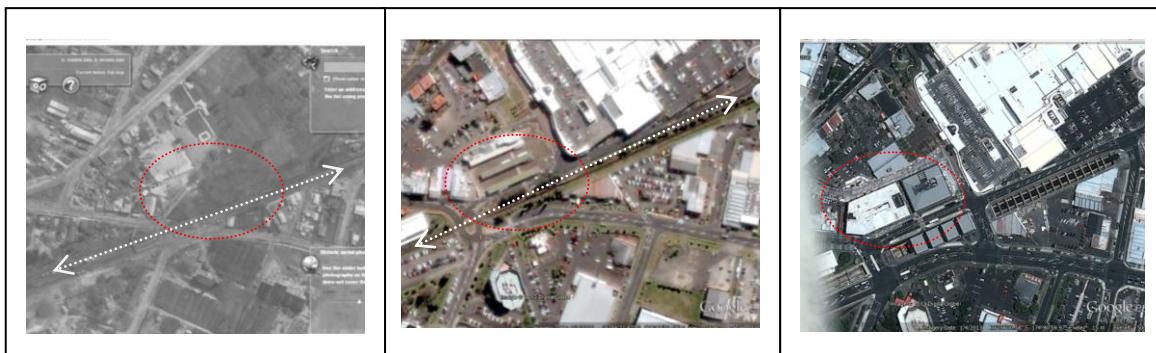
The above example involves some form of tax on a property in the catchment. Other alternatives to capture increased land values involve council involvement in the redevelopment process, such as purchasing land ahead of development and reaping the benefits of revaluation through ownership, or sale/lease of a public asset, like an air space lease above the corridor

Land development

In some circumstances, the council could be justified in purchasing land as part of the project, for example in and around the main interchange points for the LRT system. This may be to accommodate the space needed for off-street bus and LRT interchange. It may also accommodate park and ride facilities for example. Other land purchases may be required to stable LRT vehicles.

These land purchases may open up opportunities for development. An example of this is in New Lynn, west Auckland. The former Auckland Regional Authority (forerunner to the Auckland Regional Council) purchased land beside the New Lynn train station as a bus interchange point. The date of this is uncertain, but would have been in the 1970s. By the 2000s, the land had been transferred to NZ Bus and a redevelopment plan proposed which involved a structured car park and apartment development on top. Meanwhile, bus interchange occurs on street in a new road configuration around the train station.

Figure 13: New Lynn development phases



These three aerial photos show the development of New Lynn over a 50 year period. The first is from 1959, when the land beside the rail station was undeveloped. The second is from the mid 1990s. The bus interchange beside the rail line is circled, and New Lynn Mall is seen to the right. By 2012, the surface level bus interchange has been replaced by a structured car parking building and commercial development. A multi level apartment development is now proposed for the area above the car park, as shown in the publicity material in Figure 14.

Figure 14: Proposed New Lynn TOD development



While in this particular case, ownership of the land shifted from the public to the private sector, there is no reason why the same principle could not be applied to land along the corridor that is owned and held by the council. However what the example does display is the potentially long time periods involved and for council to be prepared to accept the risk and returns involved.

4.7.11 Air Space / Ground Leases

In major interchange points where council controls the facility, the council could lease space for commercial activities like newspaper kiosks, food stalls and coffee carts. Advertising (billboards) is also a possible revenue source. The revenue from such enterprises is not likely to be large, but could cover some maintenance costs of the facility, for example.

Air space lease typically relates to the lease of air space above road reserve. An air space lease (as distinct from an encroachment license) is usually granted to buildings or structures of a more permanent nature and where greater certainty for the building owner is required (eg, buildings over a footpath above the ground floor or buildings that traverse portions of the public network corridor).

Wellington City Council, as owner of the road reserve, is the agency that would be able to collect funding from this revenue source.

The Wellington City Council's Encroachment Policy includes the following definition:

"A road encroachment lease is a property right to authorise exclusive occupation of airspace or subsoil. It creates an interest in the airspace or subsoil for the lease term, subject to compliance with the lease terms (such as payment of rental)."

There are some restrictions on airspace lease, including that the space must not be:

- For wet room use such as a kitchen, bathroom or laundry
- More than 25 percent of the room it is part of
- Instrumental to the functioning of the apartment or building it is attached to (e.g. lift core).

If the encroachment was to be removed the building must still function for its intended purpose.

A one-off fee covering the duration of the proposed lease – generally the lifetime of the building to which the lease relates is imposed in airspace leases. Fees are based on a market valuation of the proposed airspace encroachment lease. The valuation will need to reflect the particular conditions of a lease, including any rights retained by the council to revoke the lease in certain circumstances.

4.7.12 Assessment against Evaluation Criteria

Table 44: Air Space lease

Criteria	Assessment
Strategic Fit	Is compatible with objectives to promote economic wellbeing but likely to be perceived as involving too much risk (land development) or trading off too much of a public good (air space).
Acceptability/Feasibility	Land development (including joint developments) is not uncommon for councils to undertake. Some restrictions in terms of Public Works Act requirements if land is to be compulsorily taken for a public work (i.e. redevelopment of the land for non-public work outcome, like housing development, is not possible). Air space lease currently possible and provided for under WCC Encroachment Policy. Funding option received with 'interest' by most stakeholders interviewed, particularly those who are currently involved in property development. Though it was agreed it wouldn't be appropriate in some areas – such as a heritage character area.
Effectiveness	Application probably limited to commercial areas (where there are few controls affecting character or heritage values). Not a reliable or stable source of income. More likely to be considered on an ad-hoc basis as new development opportunities arise.

Efficiency	Direct involvement by council in the development process to realise land value increases would be more efficient than indirect involvement, but comes with the concern that council will crowd out private developers and expose the public to risks that are unacceptable.
Equity	No major issues with regard to equity
Affordability	Council would likely have to borrow money to invest in land/development opportunities, and as such may have some impact on rates.

4.7.13 Potential risks and implications

Council involvement in the development process faces the same range of risks that are faced by private sector developers, including financing, development approval and uncertainty of revenue from sales.

In all likelihood, opportunities for land development will be limited.

Air space leases are heavily controlled by the council as there is a natural reluctance to see the public realm reduced because of private development. In addition to internal council agreement from various departments that such a use of a piece of road reserve is appropriate (e.g. traffic engineers, urban designers), there is the key objectives of the Encroachment policy to consider as well as the relevant central area rules in the District Plan.

- Rule 13.4.11 requires a discretionary unrestricted consent application for any buildings and structure located above the street that exceeds 25 percent of the width of the road at any point.
- In addition, Rule 13.6.3.4 seeks to protect sunlight access to listed public spaces. A number of these public spaces are found along the route of the public transport spine, suggesting that there may be some difficulties in addressing this rule.

5 Potential to Fund Options

5.1 Introduction

The previous chapter looked at the quantum of funding possible from a range of alternative funding tools. This chapter builds on that work by analysing the extent to which five of the options identified in the previous chapter are capable of funding the three PT spine options. This work was carried out by Douglas Economics.

The five options studied were:

- GWRC Regional Rates
- PT fare rises imposed on all bus and train trips made in the region (or limited to the PT spine corridor),
- Regional fuel tax (RFT) on petrol and diesel purchased in the Wellington region;
- Cordon charge on vehicles entering Wellington City on AM peak trips or AM and interpeak trips; and
- Car parking levy levied on both private and public parking.

These options were selected for further study as they represent the more realistic options to fund the most expensive, LRT option.

Douglas Economics developed a Excel spreadsheet model for this analysis. The model used results of the PTS study; demand estimates and responsiveness (elasticities) reported by HYC; rates information available on the Stats NZ website, and GWRC annual / longer term plans. The forecasts in the model were expressed in nominal prices (prices of the day) and used Local Authority forecasts developed by BERL to inflate prices over time.

Indicative forecasts were developed covering only first-round effects and excluding any inter-relationships between funding methods (for example a regional fuel tax or cordon charge may encourage a switch from car to public transport increasing net revenue). Economic ‘multiplier’ impacts of the funding methods on the regional economy were also not modelled.

5.2 Impact on Regional Rates

As noted in section 4.1, GWRC levies rates mostly according to a general rate and a transport rate. Regionally, the transport rate accounted for \$138 or roughly one half of the average total rate of \$286 per property. Across the region, the transport rate ranged per property from \$22 in Masterton District to \$224 in Porirua. For Wellington City, the transport rate was \$142 per residential property.

Projected population increases were factored into an assessment of how much the regional rate would need to rise to meet the funding identified. The population adjustment factor had the

greatest effect for Wellington City (a reduction of 11%) because of a greater increase in forecast population than for the ‘rest of the region’ as a whole. The population adjustment was also greater for LRT due to the longer funding period.

The required increase in regional rates per average residential property is presented in Table 45. For BP, an average annual increase of \$8 was predicted for 2013 which would then rise with CPI. For BRT, the average rate increase was \$15 varying from \$4 in Masterton to \$19 in Wellington City.

Much higher increases were predicted for LRT averaging \$144 over the region and varying from \$40 for Masterton to \$173 for Wellington City and \$182 for Porirua. These increases equate to a 50% increase in the average regional rate bill or 8% in the total rate bill (City/District + Regional).

Table 45: Increase in Regional Rates required to fund PTS options

ANNUAL AMOUNT PER AVERAGE RESIDENTIAL PROPERTY (2013\$)

City/District	Average Rate Increase p.a			Percentage Increase ^		
	BP	BRT	LRT	BP	BRT	LRT
Wellington City	\$10	\$19	\$173	3%	6%	57%
Lower Hutt City	\$8	\$15	\$137	2%	4%	38%
Upper Hutt City	\$8	\$15	\$140	3%	5%	45%
Porirua City	\$10	\$19	\$182	3%	6%	54%
Kapiti Coast District	\$6	\$10	\$97	2%	4%	39%
Masterton District	\$2	\$4	\$40	3%	5%	44%
Carterton District	\$3	\$6	\$55	3%	5%	51%
South Wairarapa District	\$4	\$8	\$75	3%	6%	57%
Overall	\$8	\$15	\$144	3%	5%	50%

[^] percentage increase calculated on regional rates only (i.e. excludes City/District rates)

5.3 Other alternative funding options

5.3.1 Overview of Forecast Revenue

Table 46 sets out the ability of each of the other four funding methods to achieve the required level of funding. The analysis shows that a regional fuel tax, a cordon charge and a car parking levy could achieve the necessary funding even for LRT, although the increases would be marked. However raising PT fares would not be able to fund LRT.

Table 46: Forecast Funding Revenue

	BP	BRT	LRT
Funding Gap PV 2013 \$	35.1	51.5	685.6
Start Year	2014	2019	2018
Funding Years	20	20	40
Funding Amount per year \$m (2013)	2.7	5.0	46.9
Regional PT Fare Increase %	4%	7%	74%
Residual Funding Gap \$m	0.0	0.0	247
Regional Fuel Tax Increase cents/litre	1.4	2.9	30.4
Residual Funding Gap \$m	0	0	0
AM Peak Cordon Charge \$/Veh (Scenario 1)	1.00	1.22	8.04
Residual Funding Gap \$m	0	0	0
AM & IP Cordon Charge \$/Veh (Scenario 2)	1.19	1.25	3.32
Residual Funding Gap \$m	0	0	0
Car Park Charge Increase %	4%	7%	117%
Residual Funding Gap \$m	0	0	0

5.3.2 Public Transport Fares

A 4% fare rise applied to all bus and rail trips could raise sufficient revenue to fund the BP option. For BRT, the required increase would be 7%. For LRT, the maximum revenue that could be achieved from raising fares, which would be with a 74% increase, would still be \$247 million short of the required funding.

For BP and BRT, the required fare increase would be much larger if restricted to only the PT spine corridor which simply reflects the small market. For BP, a 59% fare increase was forecast. For BRT and LRT however, it would not be possible to generate sufficient revenue. For BRT, an \$11.5 million shortfall was forecast and for LRT the ‘shortfall’ would be very large at \$630 million.

5.3.3 Regional Fuel Tax

A regional fuel tax of 1.4 cents levied on petrol and diesel in the Wellington Region would completely fund the BP option with a 2.9 cent regional fuel tax funding BRT. A much larger tax of 30.4 cents would be required for LRT.

5.3.4 Cordon Charge

A cordon charge of \$1 levied on vehicles entering Wellington CBD in the AM Peak would fund the BP and a \$1.22 charge would fund BRT. The estimated impact was based on modelling undertaken by GWRC. For LRT, a much higher charge of \$8.04 would be required.

Given an administration/collection cost estimated at 70 cents per vehicle, widening the cordon charge to cover the inter-peak (set at half the AM peak rate) would somewhat perversely increase the charge for BP and BRT. For LRT, a cordon charge of \$3.32 in the AM peak and \$1.66 in the inter-peak would produce the required level of funding.

5.3.5 Car Park Levy

A 50c car park levy imposed on private all-day car park spaces would fund BP with a \$1 increase funding BRT. For LRT, a levy that more than doubled (117%) car park charges (both public and private paid car parking) would be required. If limited to public paid car parking i.e. WCC owned car-parks then the demand responsiveness would probably increase (because car parkers would divert to private spaces). Further modelling could look at differential private/public car parking levies.

6 Summary

Table 47 presents a summary of the alternative funding tools assessed, in terms of the quantum of funding potentially available, the potential of each tool to fund the PT spine options on its own and the main issues associated with use of the tools.

Key findings from this investigation are:

1. The forecast annual funding requirements for the PTS options are:
 - Bus priority (BP) - \$2.7m
 - Bus rapid transit (BRT) - \$5.0m
 - Light rail transit (LRT) - \$47.0m
2. Traditional funding sources of rates and fares could be used to fund BP and BRT. However for the most costly option, LRT, the maximum increase in fares would not be able to fully fund the cost, and to fund this option through rates would require an average total regional rate increase of over 50%, which would be likely to be unaffordable and politically unacceptable.
3. For the LRT option, and possibly also the BRT option, it would be necessary to use a wider range of funding tools (than just rates and fares) to spread the cost and/or target them more effectively.
4. The tools that generate the most revenue are those that are most broad based, but run the danger of being challenged as covering households and businesses that derive limited benefit from the PT spine. To be acceptable, such tools may need to fund a variety of regional transport projects, not just the PT spine project. This reduces the extent to which they can be relied upon to be dedicated funding sources.
7. Tools directed at the PT spine corridor rather than the city or region are more directed at those who will benefit, but they cover a narrower base, and as a result generate less revenue due to concerns about affordability.
8. A regional fuel tax, a cordon charge or a car parking levy could achieve the necessary funding to fund any of the options.
9. There is no current legal mandate for several of the funding tools examined, including road pricing, value capture and regional fuel tax.

Table 47: Summary of assessment of alternative funding tools

Funding Tool	Legal Mandate	Responsible organisation	Quantum of funding	Potential to fund options	Key Issues
General and Targeted rates	Yes	WRC or WCC	<p>A Wellington City wide, flat transport levy of \$100 per rateable property per year would generate \$7.5 to \$8m per annum.</p> <p>A targeted rate along the PT Spine corridor may generate around \$7m per annum.</p> <p>A 20% increase in current regional transport rate would generate \$9m per year and see average residential rates in Wellington City rise by about \$25 per annum.</p>	<p>BP – Yes; average \$8 increase in annual regional transport rate</p> <p>BRT – Yes; average \$15 increase in regional transport rate</p> <p>LRT – Yes; \$144 increase in regional transport rate.</p>	<p>Significant increases in rates to fund PTS options either through a city-wide levy or increase in current regional targeted transport rate could be politically unacceptable.</p> <p>An area-based targeted rate is more directed at who benefits, but will generate less revenue, taking into account affordability issues.</p>
Farebox recovery	Yes	Regional Council	<p>A 10% increase in average network-wide fares from \$2.55 to \$2.80 per trip would raise \$5m per annum, a 30% rise \$13m per annum.</p> <p>By 2031, additional revenue would be \$10m and \$27m per annum respectively, based on additional patronage.</p>	<p>BP – Yes; 4% fare rise</p> <p>BRT – Yes; 10% fare rise</p> <p>LRT – No (max fare rise of 74% would leave \$247m shortfall)</p>	Raising fares will deter people from using public transport
Regional Fuel Tax	No	Regional Council	<p>A 5c increase in petrol tax is estimated to generate \$13.5m per annum.</p> <p>A 10c increase would generate \$26.9m per annum.</p>	<p>BP – Yes; 1.4 cents/ltr levy</p> <p>BRT – Yes; 2.9 cents/ltr levy</p> <p>LRT – Yes; 30.4 cents/ltr</p>	<p>Broad based funding tool not targeted at beneficiaries of the PT spine project</p> <p>No longer a legal mandate for this option.</p>

Funding Tool	Legal Mandate	Responsible organisation	Quantum of funding	Potential to fund options	Key Issues
Car parking levies/targeted rates on car parking facilities	Yes	WRC or WCC	If 20,000 CBD commuter parks were levied, then the following revenue may be generated: \$250 per car park, per annum - \$5m per annum \$500 – \$9.5m per annum \$1,000 - \$18m per annum	BP – Yes; 50c per day levy on all long stay parking spaces BRT – \$1 levy per day on commuter car park spaces LRT – 117% increase on daily car parking costs	A car park levy is expected to be simple to apply, but will be subject to debate as to whether it will deter people visiting the CBD. As with petrol taxes and congestion charges, the levy has a regional impact as it covers all commuters into the CBD. May not reduce travel demand during the peak periods.
Road Pricing (Cordon Charge)	None	Regional Council	Cordon charge on inbound commuter traffic in AM peak only into CBD \$2 per day - \$9.6million per annum \$4 per day - \$20.4 million per annum \$6 per day - \$27.5 million per annum	BP – Yes; \$1 cordon charge on AM peak BRT – Yes; \$1.22 cordon charge in AM peak LRT – Yes; \$8.04 cordon charge in Am peak	Has the benefit of managing congestion as well as raising revenue. Leads to more efficient allocation of scarce roading resources All vehicles entering the CBD will pay the charge and therefore there is a regional impact in terms of who pays. The region as a whole benefits, but there will be a need to show that funds are directed at improving public transport across the region. Needs a legislative mandate.
Development Contributions	Yes	WCC	Development contributions levied in the immediate PT corridor of between \$2,000 and \$9,000 per household unit may generate between \$19 and \$80m over a 20 year period (with no discounting of future	BP/BRT/LRT - No	Development contributions would be likely to cover only 5 to 10% of capital costs. Pressure from government to limit or reduce development contributions

Funding Tool	Legal Mandate	Responsible organisation	Quantum of funding	Potential to fund options	Key Issues
			<p>income). This is \$1m to \$4m per annum.</p> <p>The lower figure is for BRT, the upper figure for LRT.</p>		
Land value capture via financial charges/ taxes	No	GWRC WCC	<p>A total of \$3.5m to \$6m per annum.</p> <p>LRT is likely to see more of an uplift in the commercial sector than BRT.</p>	BP/BRT/LRT - No	<p>Funding would only be available post construction and upon resale of properties, or if/when rezoning occurs.</p> <p>Significant risk that market conditions will not respond as predicated and that wider economic conditions may see any uplift wiped out</p> <p>Needs specific mandate.</p>
Land value capture via land ownership (e.g. land banking, air rights leases)	Yes	WCC	No assessment of funding quantum is possible. Council does not have any significant land holdings in the area, while there are few air space lease opportunities given current policy settings.	n/a	Unlikely to be a major source of income.
Public Private Partnerships	Yes	GWRC	PPPs are not a funding tool as such. They are a way of sharing risks between a number of parties	n/a	Council would need to commit to a long term funding arrangement with a PPP partner or consortia.

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Appendices

Appendix One: Funding options – initial list provided by GWRC

Table: GWRC initial assessment of funding tools

Funding Tool	Legislative Context and limitations	Potential for further analysis as part of this study
Targeted rates	Local Government (Rating) Act. A range of targeted rates already applied by GW, including region wide formulas for Westpac Stadium and WRS.	✓
Development Contributions	LGA. Regional Councils cannot levy development contributions directly and PT systems likely to be owned by GW, however could be levied by WCC. Can be difficult to assign contribution to brownfield development. Only provides for Capex funding.	✓
Financial Contributions	RMA, unlikely to be useful as a tool as development will only have an indirect effect on PT use and therefore unlikely to pass statutory threshold	✗
TIF	Uncertain legislative mandate in NZ. Complicated to setup and apply. Targeted rates form a quasi alternative that are sufficient for this study	✗
Regional Fuel Tax	LTMA amendment enacted during the course of this study that removed ability to use this tool.	✓
Congestion pricing	No current legislative mandate, however previous study undertaken by GW in 2007 looking at application in Wellington could be used to provide theoretical approach without much additional work	✓
Car parking levies and/or Car parking targeted rates	<p>Local Government Act provides for bylaws and fees that could be utilised for parking levies. This would impose a levy on all parking spaces (public and private) possibly using a coupon system.</p> <p>Local Government (Rating) Act allows for targeted rates based on land use. This would apply only to dedicated parking facilities, and would exclude private parking spaces and on-</p>	✓

	street parking.	
Public Private Partnership (PPP)	Local Government Act. Multiple examples of this type of funding for transport infrastructure overseas. A possible funding source for Wellington, however analysis in the feasibility study is unlikely to provide any meaningful conclusions that could not be drawn from existing examples, and this option is very complex. Perhaps sufficient in this study to simply draw out some of the options for structuring a PPP, drawing on overseas examples.	✗
Air space lease above corridor	Local Government Act provides general powers to lease property. This could be done to offset expenditure on a PT project or as a commercial arrangement with a developer in exchange for construction of PT project.	✓

Appendix Two: Funding Criteria

Legislative Mandate

Greater Wellington Regional Council operates under the Local Government Act, as amended in 2012. Under this Act, the Council can use the following funding tools (section 103(2) of the Local Government Act 2002) when funding operating and capital expenditure:

- General rates
- Targeted rates
- Grants and subsidies
- Interest and dividends from investments
- Fees, charges and other operating revenue
- Lump sum contributions
- Borrowings
- Proceeds from asset sales
- Development or financial contributions
- Any other source (including reserves).

Section 101(3) requires that the following factors be considered when assessing whether to use these funding tools:

- (a) *in relation to each activity to be funded,—*
- (i) *the community outcomes to which the activity primarily contributes; and*
 - (ii) *the distribution of benefits between the community as a whole, any identifiable part of the community, and individuals; and*
 - (iii) *the period in or over which those benefits are expected to occur; and*
 - (iv) *the extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity; and*
 - (v) *the costs and benefits, including consequences for transparency and accountability, of funding the activity distinctly from other activities; and*
- (b) *the overall impact of any allocation of liability for revenue needs on the community.*

As an example of how these criteria are currently applied to the funding of transport services, the Council's Financial Policy states that Greater Wellington is involved in providing public transport services, for the following two reasons, in addition to the fact that public transport is a public good:

- Market failure (road use in the region is cheaper than it should be because road users in the region do not pay a price that reflects the congestion and environmental costs they impose on others)
- Social issues (meeting the needs of the transport disadvantaged).

The following detail is then provided in terms of the criteria listed in Section 101(3) in relation to transport funding:

Primary Community outcome:

- *Connected community, strong economy, healthy environment*

Distribution of benefits

- *Road users benefit directly through less congested roads*
- *Public transport users benefit directly by travelling to their destination for a subsidised fare, and from more frequent and better quality services*
- *People in the region benefit indirectly through reduced pollution (reduced car emissions) and the existence of a public transport system as an alternative transport option*
- *Roading authorities benefit from reduced wear and tear on their networks and delayed construction of new roads*
- *The transport disadvantaged, including people with disabilities, benefit directly by obtaining transport services*
- *Family and friends of those with disabilities benefit indirectly by less need to “taxi” people with disabilities*

Timeframe of benefits

- *Significant capital costs are incurred in providing this activity and thus there is significant inter-generational equity considerations – future generation’s benefit from capital expenditure made now. Other benefits are ongoing*

Contributors to need for activity

- *Road users cause the problems (and associated costs) of congestion and pollution*
- *Road operators may contribute to congestion and pollution (and associated costs) through poor road design or poor traffic management*
- *Businesses and residents expect and demand the existence of a certain level of public transport services in the region*

Costs and benefits of distinct funding

- *The total sum raised by targeted transport rates is considerable. As they are collected in conjunction with general rates the marginal cost of collection is very minor, fully justifying a distinct funding source*

Principles of taxation

A number of principles of a good taxation system exist. The following six principles were used by the NZ Tax Working Group, whose report was publicly released at a press conference on 20 January 2010.

Efficiency and growth:

Taxes should be efficient and minimise as far as possible impediments to economic growth. That is, the tax system should avoid unnecessarily distorting the use of resources (e.g. causing biases toward one form of investment versus another) and imposing heavy costs on individuals and firms.

An important question is how various taxes affect key economic and social variables such as employment, investment, savings, productivity growth and international competitiveness.

Equity and fairness:

The tax system should be fair. The burden of taxes differs across individuals and businesses depending on which bases and rates are adopted. Assessment of both vertical equity (the relative position of those on different income levels or in different circumstances) and horizontal equity (the consistent treatment of those at similar income levels, or similar circumstances) is important. The timeframe is also important, including how equity compares over peoples' life-times.

Revenue integrity:

The tax system should be sustainable over time, minimise opportunities for tax avoidance and arbitrage, and provide a sustainable revenue base for government.

Fiscal cost:

Tax reforms need to be affordable given fiscal constraints.

Compliance and administration cost:

The tax system should be as simple and low cost as possible for taxpayers to comply with and for the Inland Revenue Department to administer.

Coherence:

Individual reform options should make sense in the context of the entire tax system. While a particular measure may seem sensible when viewed in isolation, implementing the proposal may not be desirable given the tax system as a whole

Local Government Funding

A number of reports have looked at how councils should fund infrastructure. The most recent in the Wellington Region context is the "Palmer report" on local government reform in the Wellington Region. This report suggested, at page 74, that taking into account the principles of good tax system, that the following principles should apply to any local govt funding system:

- **Efficiency and complexity** – the proposed system and model needed to cope efficiently with the complexity and detail of funding decisions made at a regional or Local Area Council level

- **Fairness and equity** – as with any taxation and funding system the proposed model must deal effectively and efficiently with the principles of fairness and equity
- **Compliance with legislative requirements** – the proposed system must be capable of satisfying the legislative requirements and obligations
- **Flexibility** – the proposed system should accommodate the use of the different rating tools and mechanisms available (such as general rate and targeted rates) while also coping with choices and options around the allocation of rating and funding decisions at a regional or local level, at an activity, service or group of activities level and the different forms of communities and ratepayers (such as residential, commercial)
- **Transparency** – allocation and funding decisions need to be transparent in the proposed system. It should be clear as to how funding and rating decisions have been arrived at or determined
- **Administration and compliance** – maintaining and administering the proposed funding and rating system should be cost effective and should avoid imposing significant compliance or administration cost on ratepayers
- **Sustainability** – the proposed funding and rating model needs to be sustainable in the medium to long term. It should avoid the need for significant continual readjustment and resetting while at the same time anticipating and coping with changing funding decisions into the future
- **Affordability and impost** – in general, the preferred funding and rating model must take into consideration issues of affordability, ability and willingness to pay. In addition, the Panel agrees that it is important that the transition from the current systems and models to the preferred state should carefully consider the impact of the change on issues such as affordability.

Project Brief

The Council's project brief set out the following possible criteria:

- Fairness
- Administrative efficiency
- Transparency
- Funding Capacity.

Other Studies

A number of other studies have reviewed funding criteria. For example Todd Litman of the Victoria Transport Policy Institute suggested the following in a study of local funding sources for public transport investments:

- Potential revenue – Amount of revenue it can reasonably generate.
- Predictability and stability – The degree that revenue is predictable and stable.
- Horizontal equity – Whether those who pay also benefit from the project.

- Vertical equity - Whether it is progressive with respect to income (whether the cost burden is smaller for lower-income households) or in some way benefits disadvantaged people.
- Travel impacts – Whether it helps achieve transportation objectives such as reduced automobile travel and increased use of alternative modes.
- Strategic planning objectives – Whether it supports strategic development objectives such as smart growth and transit-oriented development.
- Public acceptance - Degree of public support and acceptance.
- Ease of implementation - Its transition (initial implementation) and transaction (ongoing collection) costs.

In January 2013, the USA Environmental Protection Agency released a report on Infrastructure Financing Options for Transit-Oriented Development. This report includes criteria for determining whether a given funding tool is appropriate for a particular situation:

- Applicability to different types of infrastructure - The most typical uses for the tool, as well as other allowable uses, with a focus on TOD infrastructure as defined in this report.
- Approval requirements and legal and political considerations - What it takes to get the tool approved for use, including whether the tool requires voter approval or is accessed through a competitive process.
- Application for strong and weak real estate markets - The extent to which implementation of the tool relies on local real estate market conditions.
- Capacity and scale - What size or scale of project the tool can be used for and/or factors that determine the amount of funding that the tool can generate. Some of the tools can be used only for projects that meet certain cost thresholds or are typically used for projects that fall within a range of costs.
- Ease of use - The ease of implementing and administering the tool.
- Timing and lifecycle - The terms of the financing and any specific repayment structures, including credits and reimbursements, necessary under the tool.

Auckland Council, in its discussion document as to alternative funding for transport, proposed the following criteria:

- Fairness - that the amount to be paid by individuals or groups should reflect their ability to pay, balanced with the benefit received for the service funded by tax or charge.
- Administrative efficiency - the costs of raising the revenue should only be a small percentage of the amount to be raised. That is, it should not cost 50 cents to collect a dollar.
- Transparency - those paying should know how much they're paying and what it is they are paying for.
- Neutrality - paying the tax or charge should not cause undesirable changes in behaviour, e.g. congesting suburban streets because charges are payable on motorways.

- Capacity - the source of funds should be large enough to provide the revenue needed without causing unacceptable hardship to those paying.

Summary of alternative funding criteria

The table below provides a summary of the different funding criteria identified.

Evaluation criteria	GWRC Project Brief	HYC Proposal	Victoria Transport Policy Institute (Litman)	USA EPA Report on transit-oriented development	Auckland Council (Getting Auckland Moving)	Tax Working Group	Wellington Local Government Reform Report
Fairness/Equity (horizontal and vertical)	✓	✓	✓		✓	✓	✓
Administrative efficiency (incl. compliance costs), ease of implementation	✓	✓	✓	✓	✓	✓	✓
Accountability and Transparency	✓	✓			✓		✓
Funding capacity	✓	✓	✓	✓	✓		
Efficiency / Value for Money		✓				✓	✓
Stability/reliability		✓	✓	✓		✓	✓
Stakeholder support / political and public acceptability		✓	✓				
Strategic planning objectives			✓				
'Travel impacts (Litman) or 'Neutrality' (Akd Council)			✓		✓		

Appendix Three: Understanding the transport and land use environment and associated benefits of the PT Spine

This Appendix provides an overview of the current land use and transport environment along the corridor served by the PTS options, relative to the region as a whole, and the likely changes to the corridor as a result of the implementation of the PTS. Having a high level understanding of the benefits from the project, both for transport users and land uses, enables a consideration of which funding tools are likely to be more appropriate.

As noted in the project brief for this study, the selected funding tools need to be tested in the Wellington context, to evaluate the potential of each tool to deliver funding and the likely quantum of this funding over time, noting any risks, implications and unknowns. Specific issues were identified as:

Catchment area

This may differ for each funding tool. For example the regional fuel tax and targeted rates might be applied at the regional level, car parking levies at the Wellington central area, development contributions at the growth spine area.

Sector Group

Different sectors will be applicable to each funding tool. For example development contributions apply only to the development and building sector; targeted rates could be applied to commercial or residential rated properties or both, and regional fuel tax applies only to vehicle users. The impacts on particular sectors will need to be examined and reported.

Assigned Costs

For several of the funding tools, there will need to be assumptions made as to the proportion of costs to assign to various sectors. For example to calculate development contributions, assumptions will be required on the proportion of funding allocated to existing v new residents/employers, and the amount to be charged per unit. These assumptions will need to be benchmarked against other local government charges.

Population

A critical factor for several of the funding tools will be the assumptions made for population and land use change, both in terms of scale and timing. The PTS study utilised two different population forecasts: The 'WCC Growth Spine' scenario as the base scenario and the medium Stats NZ population projections as the alternate scenario.

Land use environment

Corridor and catchment areas

The PTS starts at the railway station, moves through the golden mile and south towards the Basin Reserve. At the Basin Reserve it splits into two arms. One arm heads south, past the Wellington Regional Hospital and terminates in Newtown. The other arm heads east, through Mt Victoria, terminating at Kilbirnie.

For the purposes of this study, the area served by the PTS has been broken down into two main areas:

- the immediate corridor as outlined above, and
- the catchment of the bus services that will use the corridor, or feed into the LRT system that will run along the corridor.

The corridor covers the areas adjacent to the PTS, while the catchments cover the outlying eastern and southern suburbs.

The corridor represents a narrow area either side of the spine. It is assumed that most of the corridor is approximately 800m wide either side of the road carriageway that will contain the PT spine. This reflects a walk of around 10 minutes to access the PTS.

The corridor and catchment sub areas have then both been further subdivided into two:

- the inner corridor covering the area north of the Basin Reserve (effectively the central business area), and the outer corridor covering Newtown, Hataitai and Kilbirnie.
- The catchment area has been divided between its southern and eastern sections, reflecting topography and the areas which feed into the respective arms of the PTS.

The table below lists the four different ‘areas’ and matches these against the area definitions used for some of the data gathered in this report. Though there are similarities there is not an exact alignment between the different data sources.

Table A3.1: PT Spine Corridor and Catchment Areas

PT Spine Area	WCC Suburb	Statistics NZ Area Unit (2006 areas)	GWRC Transport Model Zones
Inner Corridor	Thorndon - Pipitea	Thorndon – Tinakori Road	61, 65, 66, 39
	Wellington Central	Lambton	49, 54, 56, 57, 59, 60, 62, 63, 64
	Te Aro	Willis Street – Cambridge Terrace	46, 47, 48, 50, 51, 52, 53
Corridor	Mt Cook	Mt Cook-Wallace Street	21, 44

	Mt Victoria	Mt Victoria West	41, 42, 43, 45
	Newtown	Newtown West	19
	Newtown	Newtown East	14
	Newtown	Adelaide	13
	Hataitai	Hataitai	10
	Kilbirnie	Kilbirnie East	9
	Kilbirnie	Kilbirnie West	11
Southern Catchment	Island Bay/Owhiro Bay	Island Bay West	16, 17
	Island Bay/Owhiro Bay	Island Bay East	16, 17
	Southgate/Houghton Bay/Melrose	Melrose	15
	Berhampore	Berhampore	20
Eastern Catchment	Lyall Bay	Lyall Bay	7, 8
	Strathmore Park	Strathmore Park	4
	Miramar/Maupuia	Miramar South	2
	Miramar/Maupuia	Miramar North	3
	Seatoun, Karaka and Worser Bays	Karaka Bay – Worser Bay	n/a
	Seatoun, Karaka and Worser Bays	Seatoun	5, 6
	Miramar/Maupuia	Maupuia	1

Overview of population, household and employment projections in the PT Spine

This study uses a number of outputs from the GWRC's transport model – which relied on both the WCC Growth Spine scenario and the alternative base projections from Stats NZ.

Table A3.2 below shows the population projections from the WCC Growth Spine projections, which were used by AECOM as the base projections in the PTS analysis.

Table A3.2: Population projections – GWRC transport model (WCC growth spine scenario – base assumptions)

Total Population	2011	2021	2031	2041	Change	% Change 2011-2041
Inner Corridor (CBD)	12,675	18,232	22,806	22,192	9,516	75%
Outer Corridor	31,652	34,894	38,022	40,444	8,792	28%
Eastern Catchment	20,291	21,102	21,662	22,192	1,901	9%
Southern Catchment	13,314	13,872	14,575	15,057	1,743	13%
Wellington City	192,317	209,984	226,399	239,368	47,050	24%

The projected increase between 2011 and 2041 of population in the Wellington CBD of 75% is off a low base, but nevertheless represents a significant pace of growth. Much of this growth is anticipated to occur in the Te Aro flat area to the south of the core CBD. To a lesser extent, but still significant is the population change expected in the remainder of the PTS corridor with a 28% population change anticipated between 2011 and 2031.

The population change estimated for the eastern catchment (9%) and the southern catchment (12%) are on par with the overall regional population growth trends.

Looking at the projected demographic changes within the outer corridor over the period 2011 to 2031, the biggest change in percentage terms is expected to be in the number of people over 65 years (Table A3.3). Traditionally this is a group with higher demands for public transport services than other groups, but often from households on fixed incomes that are asset rich but cash poor.

Table A3.3: Demographic changes: 2011 to 2031 – Statistics NZ medium projections - PTS outer corridor study area

Age Bracket	2011	2031	Change	Share of change
0-14	3,900	4,720	820	9%
15-39	19,720	21,010	1,290	15%
40-65	8,200	12,490	4,290	49%
65+	2,570	4,860	2,290	26%
Total	34,390	43,080	8,690	100%

The number of people in the middle age bracket (40 to 64) grows the most in absolute terms. These tend to be people in their prime income generating years, with high participation rates in the workforce and who therefore may be more able and willing to pay for increased levels of service for access to workplaces.

These population statistics are largely mirrored in the projected household figures outlined in Table A3.4 below.

Table A3.4: Total Households – GWRC Transport Model - PTSS Study Area

Households	2011	2021	2031	2041	Change	% Change
Inner and Outer Corridor	17237	21180	25087	28156	10919	63%
Eastern and Southern Catchments	12541	13604	14667	15305	2764	22%

In 2011 there were over 17,000 dwellings in the corridor and by 2041 there are expected to be 28,000; an increase of more than 10,000 dwellings. Most of this housing will be accommodated by way of infill and redevelopment. As a result there is anticipated to be a large increase in apartments and town house units in the CBD and along the remainder of the corridor.

The rate of growth in the catchments is more modest, but still notable with a projected increase of 2,700 units between 2011 and 2041.

Interestingly, the employment projections used do not illustrate significant contrasts between the PTS corridor and the remainder of the City or Region (Table A3.5).

Table A3.5: Total Employment by workplace

Total Employment	2011	2021	2031	2041	Change	% Change
Inner corridor CBD	79459	84705	88663	93752	14294	18%
Outer corridor	15552	16829	17821	18844	3292	21%
Wellington City	135785	145220	152414	161104	25319	19%
Region	240498	256741	269166	275522	35023	15%

Regional employment is expected to increase by 35,000 people over the next 30 years (15% change). The CBD is expected to change by 18% and the remainder of the PT Spine corridor by 21%. Given this higher rate of growth for the remainder of the corridor, it is useful to look further at the types of employment projected in this area (Table A3.6).

Table A3.6: Type of Employment in Outer Corridor

Outer corridor	2011	2021	2031	2041	Change	% Change
Retail	2839	3042	3202	3397	558	20%
Service	10367	11318	12059	12735	2368	23%
Other	2346	2469	2560	2711	366	16%
Total	15552	16829	17821	18844	3292	21%

This clearly shows that the retail and service industries are the main forms of employment in this area. This is largely a reflection of existing land uses, e.g. (service industry along Adelaide Road) and the two shopping centres in Newtown and Kilbirnie.

Overview of development activity (2001 – 2012)

To further understand development activity along the corridor (as compared with the remainder of the City) we have analysed building consent data between 2001 and 2012. The data provides some clear signals around what can be expected to occur in the corridor in the future, given the nature of existing land uses and scope for future redevelopment.

Key data investigated includes numbers of buildings consents issued, total value of work and additional floor space provided.

Looking first at housing, Table A3.7 outlines the key trends for flats and apartments. As noted, given the emphasis on redevelopment, most new housing in the corridor will have to be in the form of apartments. The corridor outside the CBD attracted 19% of the apartment units added between 2001 and 2012, roughly equal to the expected population growth between 2012 and 2031.

Table A3.7: Flats and Apartments (2001 – 2012)

	Number of Units Added	Value \$m
Number of Units / Value \$m		
Inner corridor (CBD)	3367	\$572.9
Outer corridor	1237	\$187.7
Rest of Wellington	2007	\$296.8
Wellington Total	6611	\$1057.4
Share of total		
Inner corridor (CBD)	51%	54%
Outer corridor	19%	18%
Rest of Wellington	30%	28%
Wellington City Total	100%	100%

This data suggests that there is a growing market for flats and apartments close to the city centre and as a result a transport environment that supports this will have positive effects on land uses.

For non-residential floorspace, the data suggests little new development was established in the corridor outside the central area (see Table A3.8). The one area of significant development was in the education and health sector. The figures are for new floorspace, but this may involve the replacement of existing floorspace.

Table A3.8: Non-residential Floorspace Added 2001 to 2012

	Offices, administration	Educational, health, social	Retail, motels, hotels
Floorspace (m²)			
Inner corridor (CBD)	310,148	49,163	114,536
Outer Corridor	3,525	192,620	12,366
Rest of Wellington	25,748	205,233	52,929
Wellington city Total	339,421	447,016	179,831
Share			
Inner corridor (CBD)	91%	11%	64%
Outer corridor	1%	43%	7%
Rest of Wellington	8%	46%	29%

The dominance of the CBD in terms of office and administrative floor space is clear. The limited level of activity in the corridor brings into question whether the PTS transport improvements will see any significance response in terms of commercial land uses outside the CBD area.

Property Values

Quitable Value data, based on their E-valuer estimate of average values shows little growth in residential values since 2007 (representing the end of the mid 2000s boom and the subsequent GFC through 2008 to 2010). The modest growth recorded suggests that demand has held up

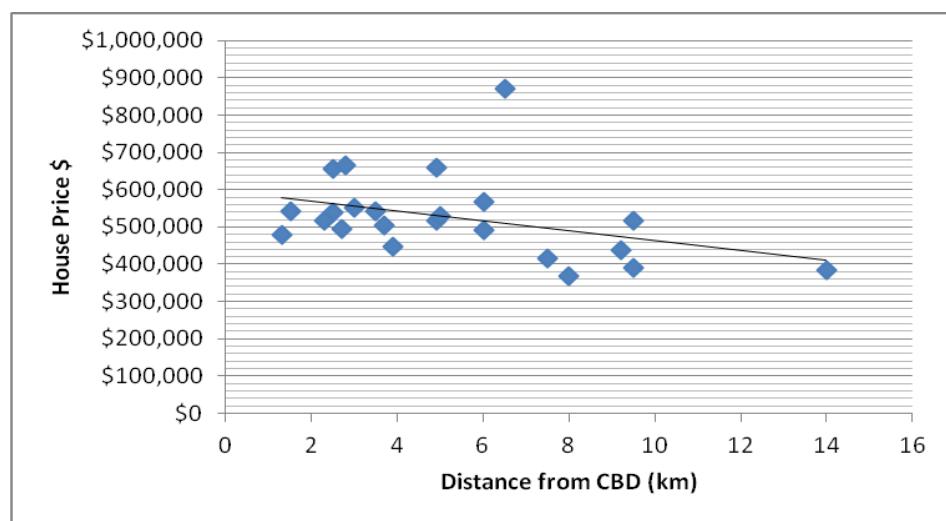
over a period of economic uncertainty. This is a positive sign that should economic growth rates return to higher levels, further appreciation of property values is likely, and with this demand for additional housing in the area of the corridor. However the property price appreciation seen in the corridor is not that much different to the city as a whole, and as a result there is no specific premium for housing in the area.

Table A3.9: House prices in selected areas of Wellington City

Area	Estimated of average value, May 2013	Estimate of % change since November 2007
Berhampore	\$447,167	-0.2%
Haitaitai	\$655,056	6.8%
Kilbirnie	\$503056	1.2%
Newtown	\$494889	1.4%

When house prices are plotted against distance from the CBD ("as the crow flies") there is a drop off in prices as distances increase, although it is not a strong relationship. This suggests that there is a relationship between transport costs and house prices and that if transport costs drop (i.e. quicker to get to work/CBD), then land values may increase.

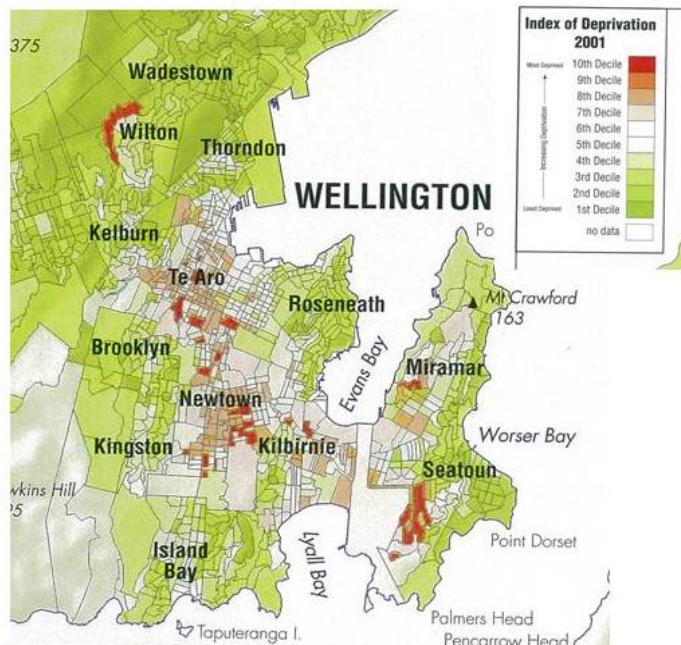
Figure A3.A: House prices versus distance from CBD



Socio Economic Characteristics

Socio-economic characteristics have not been studied in detail. A summary of conditions along the corridor and within the catchments can be obtained from viewing NZ Deprivation Index data (from 2006, being the last census). This data ranks each suburb in New Zealand based on a range of data relating to incomes, housing and access to services and then groups suburbs into 10 categories. A decile ranking of 10 (red areas in Figure A3.B below) indicates the most deprived areas, while a decile ranking of 1 indicates least deprivation (green areas).

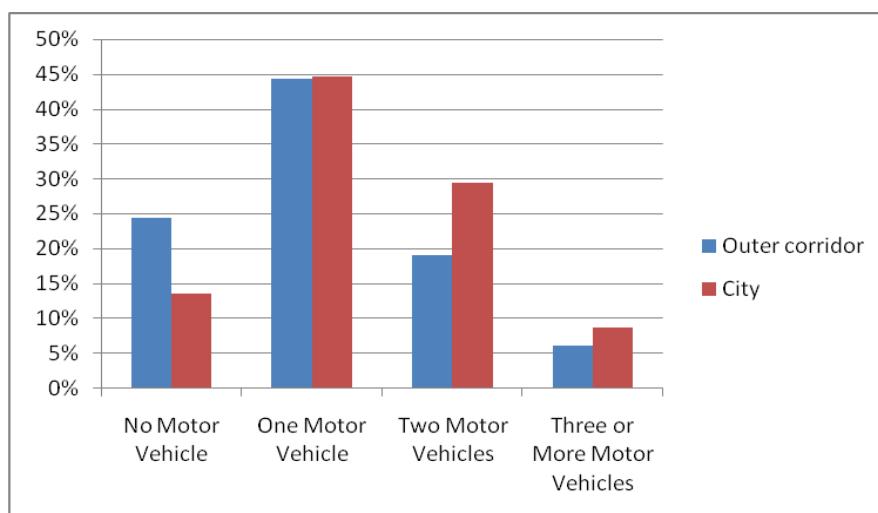
Figure A3.B: Deprivation index: PTS corridor and catchment, 2006



The corridor contains a mix of areas with medium to low decile rankings, suggesting households on tighter budgets, but also ones more dependent upon public transport. In contrast, the catchments (Island Bay, Miramar, Seatoun) contain higher decile suburbs. These suburbs should have a higher willingness to pay for improved transport options (whether these are private or public).

Figure A3.C shows the number of households without access to a motorcar in 2006, and those with 1, 2 or 3 or more cars. It can be seen that in the corridor outside of the CBD, up to 25% of households do not have a car, compared to around 13% for the city as a whole. Rates of multiple car ownership are also much lower in the corridor, suggesting that where households are formed by couples and families, then at least one member is likely to have some dependency on public transport services during the day.

Figure A3.C: Number of motor vehicles per household, 2006



The Wellington Central City Apartment Survey (2009)¹⁰ provides more insight into the travel habits and car ownership patterns of those living with the inner (central area) portion of the corridor. Key findings from the 1350 survey respondents (25% response rate) include:

- 73% of respondents walk to work or study. 13% use a car and 6% use a bus as main form of transport to work or study
- 69% of survey respondents own a car, but significantly 31% do not. Of those that own a car, 49% use it on both weekdays and weekends, 46% only use it on a weekend and 5% only use it during the week
- Most car owners park their car in the apartment car park (79%), with 10% parking it on the street, and 7% in another leased car park space
- When asked where they park their car during work hours, 59% stated it remained in the apartment building, 17% said it was parked in a workplace parking space, 10% on the street and 8% in a leased car park building.

District Plan zoning and development potential

The three main sectors of the PTS traverse a number of District Plan zones (Table A3.10). This section briefly reviews the current planning environment along the corridor and the extent and type of development and redevelopment enabled or restrained by Wellington City's District Plan.

Table A3.10: District Plan Zoning

PTSS Area	Primary Operative Plan Zone	Proposed Plan Change 73 zone
Railway Station to Basin Reserve	Central Area	n/a
Basin Reserve to Newtown	Suburban Centre Institutional Precinct (Hospital)	Centre
Mt Victoria to Kilbirnie	Inner Residential Area Outer Residential Area Open Space Suburban Centre	Centre and Medium Density Development

NB: there are small pockets of Open Space zoning within each of the main areas identified above.

Railway Station to Basin Reserve

This area is zoned Central Area, a mixed use zone that provides for a very wide range of activities. The Central Area can be split into two distinct areas, being the High City and the Low City. The High City is the heart of the CBD, located close to the waterfront and is characterised by small blocks, tall office buildings and a vibrant retailing sector. The Low City includes much of Thorndon and Te Aro, and is predominantly occupied with buildings between 1-6 storeys, and a

¹⁰ Wellington City Council (2009) Central City Apartment Dwellers Survey.

much greater mix of land uses. Residential apartments have become a more popular form of land use in Te Aro at the expense of traditional light industrial land uses.

There is still considerable untapped development potential in the Central Area. The majority of future development is expected in the Te Aro flat, which still has a significant proportion of undeveloped land potential. There is a high concentration of heritage buildings in some areas of the zone, for example Cuba St Heritage Area and the Courtenay Heritage Area. The associated heritage controls do have a dampening effect on the redevelopment potential for some parts of the Central Area.

Basin Reserve to Newtown

This area was the subject of intensive study in 2008 looking at the possible redevelopment options along Adelaide Road, which is a major thoroughfare between the southern suburbs of Newtown and Island Bay and the central city. The outcome was the Adelaide Road Framework, which envisages significant urban change over the next 20+ years to create a prosperous and high quality mixed-use area. The vision provides for significantly more residential development to accommodate approximately 1550 more people by 2026. To help achieve this, proposed Plan Change 73 provides for some areas to have greater development potential, with building heights being increased from 12m to 18metres.

Character controls are imposed over much of the wider residential area in Newtown and over the shopping area which limits the scale of redevelopment opportunities in this suburb.

Mt Victoria to Kilbirnie

Character controls imposed over Mt Victoria limit scope for significant redevelopment opportunities through this part of the spine. Similarly, as the PTS travels down Wellington Road it traverses a residential zoning on one side and an Open Space zooming on the other (Wellington Town Belt) which also restricts significant future development potential in this area. However, significant scope is provided for future development in and around the Kilbirnie town centre. This area already has existing development potential and, as a result of Plan Change 73 (Suburban Centres Review), further development potential has been provided for. Areas immediately surrounding the main Kilbirnie town centre have been zoned for medium density development. Also, as noted below in Table 19 below, the bus barns site close to the Kilbirnie town centre has been specifically identified as providing for future residential development, providing 235 residential units.

Land use development opportunities – Wellington City

Wellington City Council's development projections are sourced from a dataset developed by Forecast i.d. It contains an assessment of forecasted future residential development in each of the city's suburbs. The forecasts are informed by existing resource consent applications, development capacity as provided for in the District Plan and other council strategy documents (such as Wellington 2040, Adelaide Road Study), rate of infill development and vacant land development.

A summary of the City's development assessments, as they relate to the corridor and catchment areas is outlined below in Table A3.11.¹¹

Table A3.11: Wellington City's land use development forecasts 2007 - 2031

PT Spine Area	Summary of development forecasts
Inner Corridor	<p>Thorndon – Pipitea Suburb</p> <ul style="list-style-type: none"> • Low to moderate vacant land development (10-20 dwellings/year) • Low to high infill development (3-70 per year) <p>Wellington Central Suburb</p> <ul style="list-style-type: none"> • Moderate to high vacant land development (20-30 dwellings/year) • Moderate to high infill development (15 – 54 dwellings/year) <p>Te Aro Suburb</p> <ul style="list-style-type: none"> • High level of vacant land development (45 dwellings/year) • Moderate to high level of infill development (20-75 dwellings/year)
Outer Corridor	<p>Mt Victoria</p> <ul style="list-style-type: none"> • Low vacant land development (1-10 dwellings/year) • Low-moderate infill development (4-12 dwellings/year) <p>Mt Cook</p> <ul style="list-style-type: none"> • Low to high level of in-centre development (3-30 dwellings/year) • Low to moderate level of vacant land development (1-15 dwellings/year) • Low to moderate level of infill development (9-15 dwellings/year) <p>Newtown</p> <ul style="list-style-type: none"> • Moderate – high in-centre development (20-30 dwellings/year) • Low to moderate level of vacant land development (7-15 dwellings/year) • Low to high level of infill development (8-30 dwellings/year) <p>Hataitai</p> <ul style="list-style-type: none"> • Low level of vacant land development (3-5 dwellings/year) • Low level of infill development (3-5 per year) <p>Kilbirnie – Rongotai – Moa Point</p> <ul style="list-style-type: none"> • High level of in-centre development (30 dwellings/year). The forecasted development of the Kilbirnie 'bus barn' site is expected to provide 235 units in total between 2016 and 2022. • Low level of vacant land development (2-10 dwellings/year) • Low level of infill development (3-7 dwellings/year)
Southern Catchment	<p>Berhampore</p> <ul style="list-style-type: none"> • Low level of vacant land development (2 dwellings/year) • Low level of infill development (8-9 dwellings/year) • Low level of in-centre development (3-10 dwellings/year) <p>Island Bay – Owhiro Bay</p> <ul style="list-style-type: none"> • Low level of vacant land development (1-7 dwellings/year)

¹¹ For graphic representation of this data see also: <http://forecast.idnz.co.nz/Default.aspx?id=366&pg=5000>

PT Spine Area	Summary of development forecasts
	<ul style="list-style-type: none"> • Low level of infill development (6-7 dwellings/year) Southgate – Houghton Bay – Melrose • Low level of vacant land development (2-4 dwellings/year) • Low level of infill development (4-6 dwellings/year)
Eastern Catchment	<p>Lyall Bay</p> <ul style="list-style-type: none"> • Low level of vacant land development (2-3 dwellings/year) • Low level of infill development (1-2 dwellings/year) <p>Miramar – Maupua</p> <ul style="list-style-type: none"> • Low – moderate in-centre development (10-20 dwellings/year) • Low level of vacant land development (1-5 dwellings/year) • Low level of infill development (3-10 dwellings/year) <p>Strathmore Park</p> <ul style="list-style-type: none"> • Low level of vacant land development (2-4 dwellings/year) • Low level of infill development (3-4 dwellings/year) <p>Seatoun – Karaka Bays – Breaker Bay</p> <ul style="list-style-type: none"> • Low level of vacant land development (4-6 dwellings/year) • Low level of infill development (2-5 dwellings/year)

Potential for Transit Orientated Development

An important issue for this study is the extent to which the investment in BRT / LRT may be accompanied by transit orientated development (TOD) – that is, more intensive, mixed use development that responds to the improved transport environment resulting from the PTS project. Such development has the potential to help generate the funding needed for the project. The potential to support TOD-like development was one of the factors in the selection of the route and mode options.

Examples and reviews of TOD type developments all suggest that TOD works best in dynamic markets. Strong markets are particularly important for retail developments. In terms of factors that assist in making TOD development feasible and viable, the following conditions are often cited:

- The BRT/LRT route should provide a strong sense of permanence and a clear identity (in addition to faster service) to attract development. Improved (preferably separate) running ways and new urban design features will also create a positive climate for investment.
- The location and design of BRT /LRT routes should consider land development opportunities. Consistency with a city's development vision is important. In the case of the PTS corridor, there are some limitations on redevelopment and increased density and height due to heritage and character controls.
- Convenient transit passenger access should be provided for developments adjacent to, or integrated with, BRT / LRT stations. Attractively designed BRT /LRT stations with conflict-free, weather-protected pedestrian ways connecting transit stations to adjacent activity centres can have a positive effect on land development.

- Site designs for TODs should encourage density, diversity, and walkability. Transit-supportive uses (such as retail, office, and residential) should be encouraged. Mixed-use developments can add interest and variety; however, the various uses do not have to be mixed in the same location.
- Parking policies should support TOD. It is desirable to avoid either too much or too little parking. Parking should be limited, especially adjacent to stations, and structured parking, while costly, may be desirable where land costs are high and space is at a premium.
- Transit-supportive policies should be established. They can specify where various developments can locate (i.e. zoning), site design and access features, and parking requirements.

In general, these conditions exist along the corridor, more so towards the CBD, although much will depend upon detailed design and the extent of local environmental improvements (improved mainstreet environments, landscape treatment, wider footpaths, traffic calming, car parking strategies).

The area south of the core CBD through to Adelaide Road is a major redevelopment area where LRT in particular has the potential to be a significant catalyst.

Transport environment

This section discusses the transport-related benefits that are expected to arise along the corridor and the wider catchment areas under the various transport options being considered in the PTS.

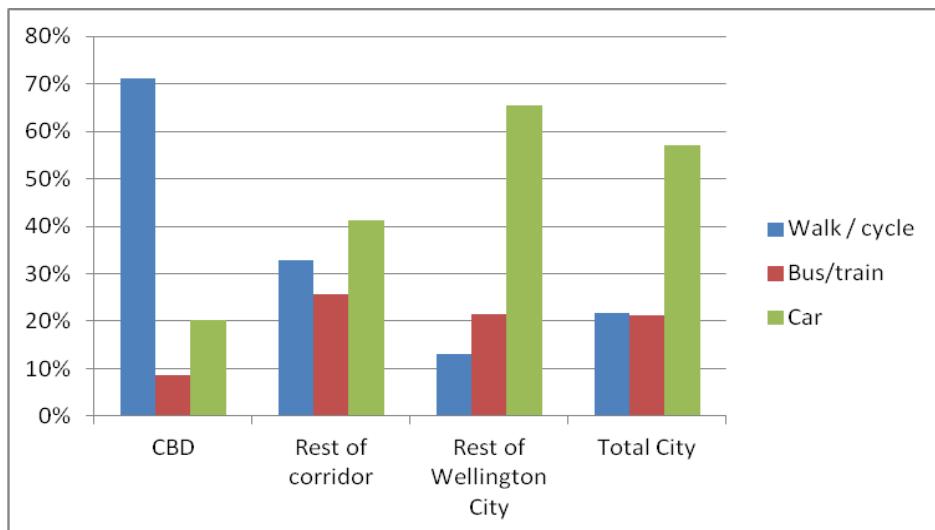
Four different measures of where land use benefits might accrue have been sourced from the WTS model:

- Public transport stops where people get on and off (i.e. board and alight) public transport
- Passenger volumes (in car and by public transport) at key points in the city
- Travel time by car compared with public transport for key journeys
- Travel time saved along key routes.

Current conditions

The graph below (Figure A3.D) shows mode split for travel to work, for those residents who travelled to work on the day of the 2006 census, for the corridor, catchment and city as a whole. It can be seen that the corridor outside the CBD had high use of passenger transport, with 25% of residents catching a bus or train, compared to about 20% for the city as a whole, for the journey to work.

Figure A3.D: Mode split 2006, travel to work Wellington City



This data suggests that there is already a degree to which development in the corridor can be said to be transit-orientated, in that, for the trip to work at least, there is a fairly even match between cars and bus/walk/cycle. Further enhancement of passenger transport services can build on this, and such enhancements do not have to compete against a strongly car-based culture or land use pattern.

Main changes to transport environment

The PTS options do not significantly raise public transport patronage levels across the region. Under the BRT option, regional passenger transport use increases by 2%, while for the LRT option, patronage grows by 0.6%, in 2021 figures.

Within the corridor and catchment area, AM peak period patronage in 2021 climbs from 7,000 trips under the base case to 7,400 under the BRT option, but falls to 6,960 under the LRT option. However these users do see some benefits in terms of faster travel times (and likely reliability of services, if services run on a dedicated corridor) as discussed below.

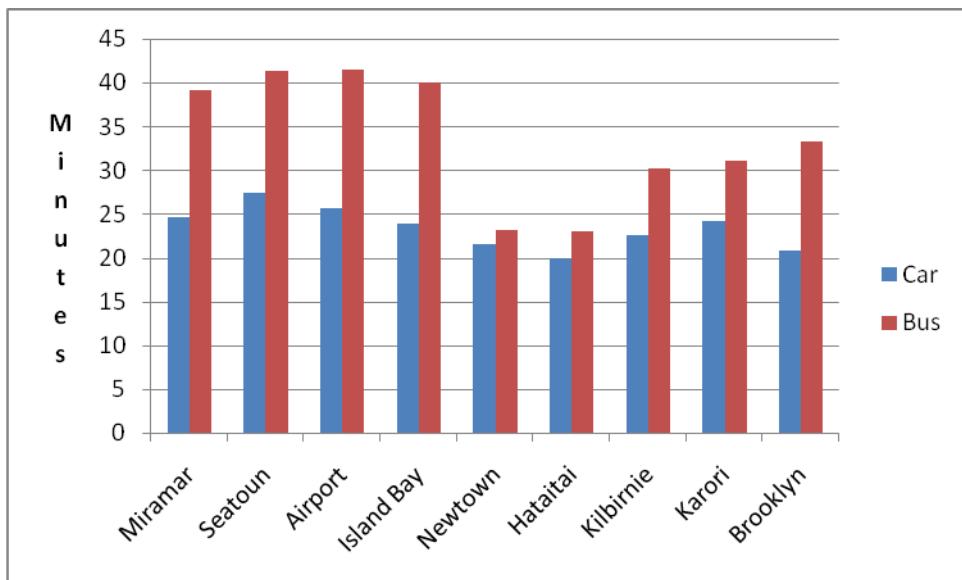
At the same time as the PTS is being considered, central Government is progressing work on identified Roads of National Significance (RoNs). The Wellington-based RoN adds considerable road capacity post 2021, and as a result the regional transport model shows a decrease in public transport use by 2031.

The PTS involves options that dedicate road space for public transport trips, and as a result, motorists face delays. This factor is represented in the benefit/cost analysis which indicates that the highway users (i.e. non public transport users) face a disbenefit in terms of increased travel times.

Relative Travel Times

Looking first at travel times from selected locations into the CBD by car and current bus services (referred to as the "base" case), all of the catchment and corridor is within a 20 to 25 minute drive (Figure A3.E). Passenger transport travel times are about 60% more than this for those suburbs at the ends of the network. The travel time penalty for public transport use is therefore quite high.

Figure A3.E: Travel times to CBD from selected destinations (AM Peak) car versus bus



The BRT and LRT options see faster travel times from locations along the corridor into the CBD than by car (Figure A3.F). For example from Newtown, travel times are expected to be 18.6 minutes by car and 18.3 minutes by BRT and 18.0 minutes by LRT. This suggests a boast to the transport accessibility of these more close in areas.

In terms of the outer lying suburbs in the catchments, car travel remains the most competitive in terms of time, but the BRT does see more of a drop in travel times relative LRT. The LRT option does not see a drop in travel times as the result of an anticipated need for transfers.

Figure A3.F: Travel times AM peak, 2021

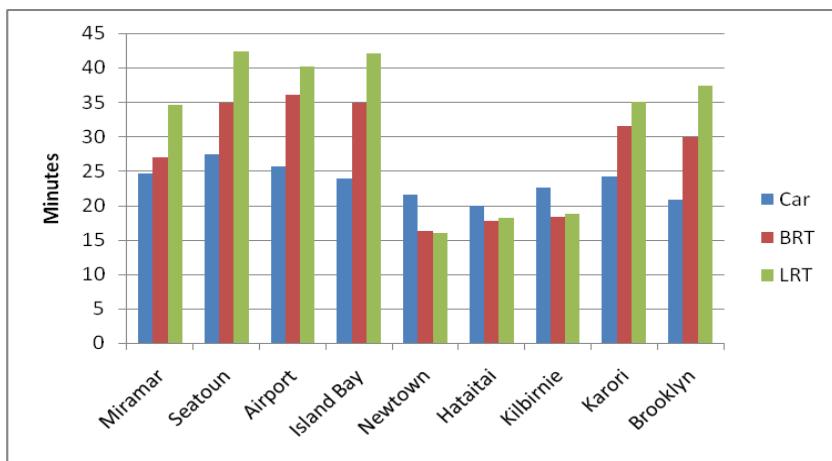
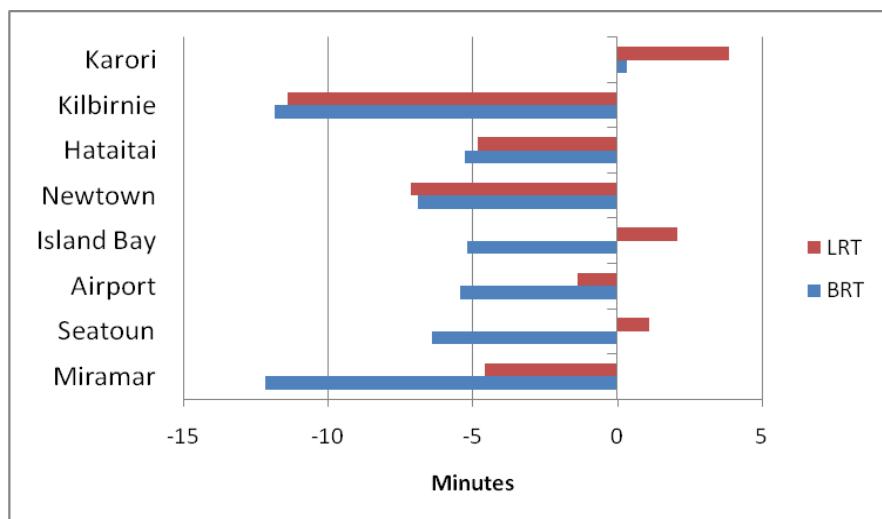


Figure A3.G shows changes in travel times by BRT/LRT relative to bus priority measures.

Reductions in passenger transport times under the BRT option for the outer lying suburbs suggest that these areas may be the main recipient of increased development pressures due to improved accessibility. In contrast, the travel time data suggests that the LRT option will see benefits more closely concentrated along the LRT corridor.

Figure A3.G: Changes in Travel Times (Minutes)



The LRT option may see travel times increase due to restrictions within the CBD area.

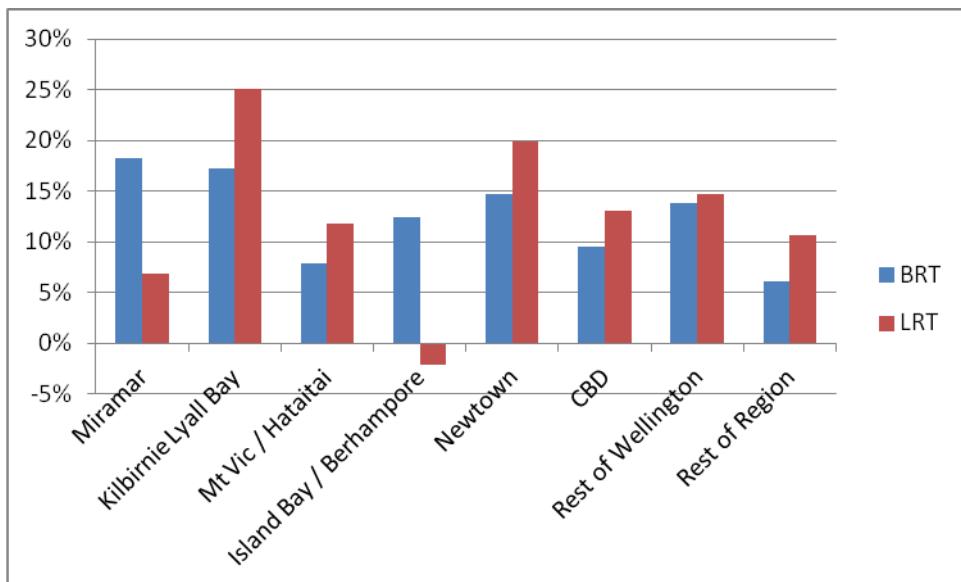
Turning to total travel time benefits for passenger transport users, taking into account walk and wait times, as well as travel times, the following table (Table A3.12) lists total minutes saved compared to the base case of bus priority, for selected trip origins, for the journey into the CBD during the AM peak.

Table A3.12: Total travel time savings, 2021

Suburb	BRT	LRT
Miramar	9,327	2,108
Kilbirnie Lyall Bay	8,764	7,760
Mt Vic / Hataitai	4,037	3,631
Island Bay / Berhampore	6,365	- 643
Newtown	7,483	6,157
CBD	4,829	4,038
Rest of Wellington	7,063	4,559
Rest of Region	3,138	3,272
Total	51,007	30,881

Translated into where the benefits are experienced, the graph below (Figure A3.H) shows the share of total travel time benefits, by origin of PT trip in the AM peak.

Figure A3.H: % savings in travel times, for selected origins



The rest of Wellington City, outside the CBD and the corridor and catchment areas, receives about 15% of the benefits, with the rest of the region adding a further 5% to 10%.

This regional benefit principally derives from the ability of users of the regional train service to utilise the BRT/LRT system to gain access to the southern parts of the CBD, with travel times from the train station to southern parts of the CBD falling by 5 to 8 minutes. This improved accessibility of the southern CBD area to the regional labour market should assist with land use intensification in this area.

In terms of the corridor versus the catchment, under the BRT option more of the benefits are experienced by the outer lying suburbs of Miramar and Island Bay, for example. For the LRT option, the benefits are much more concentrated in the corridor itself.

For destinations, the CBD receives the major benefit, with some small benefit for Newtown and Kilbirnie as destinations (see Table A3.13).

Table A3.13: Share of travel time savings by destination

Destination	BRT	LRT
Miramar	3%	1%
Kilbirnie Lyall Bay	3%	5%
Mt Vic / Hataitai	0%	0%
Island Bay / Berhampore	0%	0%
Newtown	3%	5%
CBD	87%	86%
Rest of Wellington	2%	1%
Rest of Region	2%	2%

Journeys to the southern and eastern catchment areas under the bus priority option results in very few time saving benefits. The LRT option provides the most obvious time savings benefits, but these are concentrated on Kilbirnie/Lyall Bay (5%) and Newtown (5%). The BRT option has

the benefits spread more evenly across the catchment areas; likely a reflection of the fact that BRT buses can continue to operate on normal roads beyond the particular BRT corridor, while LRT requires a transfer.

Boardings and alightings from Public Transport

What is of interest for this study is where along the network there is an increase, if any, in the number of boardings and alightings. This can help to demonstrate benefits to a commercial area as a result of increased foot traffic.

Table A3.14 contains a description of boardings and alightings from particular stops.

Table A3.14: Boardings and Alightings

PTS Option	Key findings in respect of land use benefits
Reference Case	<p>Most popular places where people board public transport are:</p> <ul style="list-style-type: none"> ○ Newtown (516) ○ Courtenay Place (580) ○ Manners Street (420) ○ Hataitai REF/BP (393) <p>Transfers between services can also be significant places of foot traffic, for instance there is a very high proportion of all boardings occurring at the Wellington Bus Terminal (7096).</p> <p>Most popular stops where people alight from public transport are:</p> <ul style="list-style-type: none"> ○ Wellington Railway Station (14261) ○ Lambton Quay 1 (4354) ○ Willis Street (3639) ○ Lambton Quay 2 (2028) ○ Courtenay Place (1104) <p>Notable PT stops where a transfer alight occurs includes the Wgtn Railway Station (1769) and the Wellington Bus Station (382).</p>
Bus Priority	<p>There is very little change in the data between the Reference case and the Bus Priority option suggesting that there will be no key benefits to surrounding land uses in the corridor under this option to enable scope for a possible alternative funding mechanism.</p>
BRT	<p>Most popular places where people would board public transport are:</p> <ul style="list-style-type: none"> ○ Wellington Bus Station (8514 - 98% of these boardings are a transfer) ○ Courtenay Place (746) ○ Newtown (733) ○ Hataitai BRT/LRT (630), ○ Wellington Rail Station (618) ○ Kilbirnie Interchange (565) <p>Key changes in boardings compared with reference case are:</p> <ul style="list-style-type: none"> ○ Kilbirnie Interchange (+43%, 169 people) ○ Kilbirnie Crescent (plus 4117%, 247 people) ○ Basin Reserve (+1500%, 90 people) ○ Constable Street (-84%, 204 people) ○ Lambton Quay 2 (-61%, 106 people) <p>The most popular places where people will alight from public transport are all found in the core CBD along the Golden Mile, end at the Wellington Railway Station and Wellington Bus Station.</p> <p>Of particular interest is that the BRT option will result in some key changes in where</p>

PTS Option	Key findings in respect of land use benefits
	<p>people alight along the route. Of note is the Cambridge stop (+255%, 388 people), Basin (+196%, 286 people), Newtown (+104%, 120 people), Wellington Bus Station (+121%, 1178 people). Elizabeth Street will lose potential PT passengers as the BRT wouldn't travel along that route.</p>
LRT	<p>Most popular places for boardings will be:</p> <ul style="list-style-type: none"> ○ Wellington Bus Station (9055), ○ Kilbirnie Interchange (1804), ○ Newtown (1726). <p>Other notable boardings include Courtenay Place (697), Hataitai BRT/LRT (636), Wellington Rail Station (618, with 98% of these being a transfer).</p> <ul style="list-style-type: none"> • Key changes in boardings compared with reference case are: <ul style="list-style-type: none"> ○ Kilbirnie Interchange (+356%, 1588 people), ○ Newtown (+234%, 1210 people), ○ Kilbirnie Crescent (+4267%, 256 people), ○ Basin Reserve (+1383%, 83 people), ○ Cambridge (+75%, 78 people), ○ Constable Street (-83%, 200 people), ○ Wellington Bus Station (26%, 2610 people). <p>These statistics show a clear impact of the LRT on the amount of likely foot traffic (and hence benefits) for the main corridor of the LRT.</p> <p>As with the BRT, the most common places where people will alight from PT are at stops along the Golden Mile (including the Wellington Bus Station). Kilbirnie Interchange and Newtown are also notable in respect of the change that occurs in alightings at these stops.</p> <ul style="list-style-type: none"> • Key changes in alights include: <ul style="list-style-type: none"> ○ Wellington Bus Station (+167%, 1633 people), ○ Kilbirnie Interchange (+344% / 1230 people), ○ Newtown (+885%, 1018 people), ○ Basin (+181%, 264 people), ○ Manners (52%, 480 people).

The increase in transfers at Newtown and Kilbirnie under the LRT option should generate some economic activity in these areas, depending upon the design of the interchange facilities. If there are opportunities for cafes, kiosks and convenience stores, then additional small goods and items could be expected to be purchased in and around the interchange points.

Traffic Volumes in Centres

An analysis of passenger numbers in cars and on public transport at key locations along the corridor provides insight into the benefit to environmental conditions in the centres along the corridor from reduced vehicle numbers. The following graph (Figure A3.I) shows changes in the number of vehicles in the AM peak passing through the three main centres on the PTS. The most significant benefit is experienced along Adelaide Road followed by Newtown.

This reduction in volumes if accompanied by local area environmental improvements has the potential to improve conditions for pedestrians, visitors and residents.

The extent to which shop keepers and other small businesses will see benefits from this reduction is hard to gauge. The BRT and LRT schemes require the removal of some on-street parking, while overall the number of "passing cars" is reduced. This will affect retail viability, but on the other hand, if the population of the catchment increase and other measures are taken to address car parking needs (such as more parking on side streets or in off-street facilities), then the effect of the PTS may be positive overall.

Figure A3.I: Vehicle volumes, selected areas

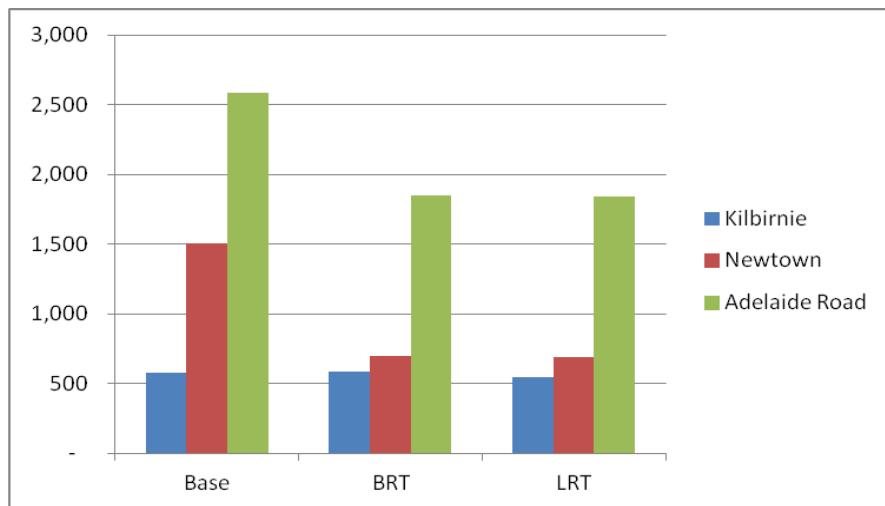


Table 3: Summary table showing proportion of public transport passengers to all passengers travelling by PT or car

		Ref. Case	BP		BRT		LRT	
		% PT	% PT	% change from Ref Case	% PT	% change from Ref Case	% PT	% change from Ref Case
Kilbirnie	Inbound	55%	58%	3%	64%	9%	62%	7%
	Outbound	95%	95%	0%	86%	-9%	95%	-1%
Newtown	Inbound	43%	72%	29%	77%	35%	77%	34%
	Outbound	8%	14%	7%	12%	4%	11%	3%
Adelaide Road	Inbound	34%	37%	3%	48%	14%	44%	10%
	Outbound	10%	12%	2%	17%	7%	23%	13%
Courtenay Place	Inbound	95%	93%	-2%	100%	5%	100%	5%
	Outbound	100%	100%	0%	100%	0%	100%	0%
Mid Lambton Quay	Inbound	85%	99%	14%	100%	15%	100%	15%
	Outbound	100%	100%	0%	100%	0%	100%	0%

Findings

Based on the above analysis, the following conclusions can be made:

Table A3.16: Key land use benefits from each PTSS option

PTS Option	Key findings in respect of land use benefits
Reference Case	<ul style="list-style-type: none"> Car travel mode is faster than public transport at the AM peak, with the gap between travel modes for travel times even greater in the interpeak period.
Bus Priority	<ul style="list-style-type: none"> A decrease in public transport travel times is predicted for AM Peak travel, but these decreases are not overly significant. No change at all for public transport travel times in the inter peak period.
BRT	<ul style="list-style-type: none"> During the AM peak, the origins that will benefit the most from reduced travel times on public transport are Miramar (12.2min) and Kilbirnie / Lyall Bay (11.9min). About 20% of travel time savings accrue to origins outside of the corridor and catchment (15% within Wellington City and 5% in the rest of the region) Access from the rail station to southern sections of the CBD is improved. Moderate reduction in vehicle numbers along corridor, leading to improved environmental conditions, but loss of on-street parking.
LRT	<ul style="list-style-type: none"> LRT sees a substantial shift in travel times for public transport for Newtown, Kilbirnie and Hataitai. Travel to CBD will be faster than car by 6.7min, 3.9 min, and 2.4 min respectively. LRT sees significant transfers at Newtown and Kilbirnie. These transfers however increase travel times from catchments to the east and south. Reduction in vehicle numbers along the corridor, and as a result improvement to environmental conditions

Appendix Four: Stakeholder Interviews

Five stakeholder interviews were carried out with key representatives of the property and retailing communities associated with the public transport spine area. Interviews were conducted with:

- Wellington Branch Property Council – Ian Cassels
- Wellington Chamber of Commerce - John Milford and Jeremy Harding
- New Zealand Retailers Association – Barry Hellberg
- Newtown Business Group – David Wilcock and Martin Hanley
- Kilbirnie Business Group – Bruce Welsh

The interviews took around one hour each. Questions were designed to illicit feedback in two key areas:

- what they perceived the benefits and costs might be of each of the three PTSS options (i.e. to test whether the perceived benefits based on other international examples were likely to be experienced in Wellington), and
- to understand how each of the funding options would likely impact on the groups they represent.

Wellington Branch Property Council

- 550 members nationwide
- They seek to represent New Zealand's Commercial, Industrial, Retail, Property Funds and Multi Unit Residential property owners, managers and investors

In discussing public transport options for the CBD, the interviewee strongly supported the need for improving the current system as this would be a big part of improving Wellington's efficiency overall and its trading capacity in particular.

However, the interviewee did not agree that the PTSS options were necessarily the best for the city. A system of smaller, battery powered buses negotiating the CBD streets in a loop with transport hubs at each end of the Golden Mile (which then connected to the larger suburban busses) was considered to produce more benefits for the inner city landowners and retailers. It was postulated that a public transport system that served the interests of retailers and property owners was more likely to attract direct financial support from the business community. The current options as proposed however are not seen as providing any significant improvement on the current bus network, so there was likely to be little support from landowners and business to contribute to funding any of the PTSS options.

In respect of any benefits that did result from an improved public transport system, it was noted that the type of land use was a key factor in the degree of acceptability in having to fund the public transport improvements. It was presumed for instance that benefits, if any, would primarily be experienced by retailers, rather than tenants in office towers above the ground floor. Therefore, even within the PT spine corridor the benefits would not be shared equally. It was

suggested that there would be strong opposition from certain sectors (i.e., office leaseholders) from having to pay increased costs to support the public transport spine.

Wellington Chamber of Commerce

- Represents over 1500 members from a wide range of businesses
- John Milford, as Chair of the Chamber of Commerce was also able to provide input based on his role as Managing Director of Kirkcaldie and Stains.

In discussing the benefits and costs of the respective PTSS options, the interviewees both questioned the perceived benefits of the PT spine, particularly for retailers. Their perception was that the existing bus system works reasonably well in providing people convenient access to the Golden Mile (access and parking being two key ingredients for a successful retailing environment). They questioned whether congestion was really a problem for Wellington, when compared with international examples of congestion.

Therefore, from a retailers perspective especially, any additional benefits associated with an improved PT spine would need to be very significant for retailers and businesses to accept the rationale for some of the alternative funding options. Further, it was noted that any funding tool that imposed costs on private vehicle users to fund public transport was likely to be strongly opposed.

The interviewees noted there would be strong opposition to anything that put barriers in the way of people coming into the CBD. Similarly anything that restricts people's choices around transport would impact on business. Strong concern was expressed around the restriction of private vehicles along the Golden Mile due to the affect on business, but also notably the flow-on negative effect this would have for businesses on side streets. The perception, therefore, was that there were more likely to be costs to many businesses in the corridor rather than benefits.

In terms of the business environment, it was suggested that there would be less retailing in the CBD in 5 years time, largely due to the influence of on-line shopping. Similarly retail loss to shopping malls (due to the lure of free parking) continues to be a pressure for the local CBD retailing environment.

Given these conditions, the interviewees noted that there would likely be strong resistance to any funding options that would make it more expensive for people wanting to come into the CBD and/or impose additional costs on businesses.

New Zealand Retailers Association

- Represents over 5000 business nationally (or approx. 49,000 individual shops with a combined income of \$70 billion/year – 60% of main merchandise spend).
- Large mix of retail, including both supermarket chains, department stores, large format retailing stores but predominant membership made up of small to medium sized retail businesses.

There is a perception among retailers that there are too many empty buses on streets already and diesel buses are causing pollution. These factors combined are creating an unpleasant pedestrian environment for shoppers.

Retailers were also more likely to prefer a public transport solution that meant there were transport hubs at each end of the Golden Mile, so that the large suburban buses do not pass through the CBD. There was support for having overflow bus services along Customhouse Quay during peak traffic to reduce congestion along the Golden Mile.

The retailers perspective on funding issues is strongly influenced by the fact that most retailers are tenants, not building owners. The retail environment is 'flat' at the moment and there is evidence of this in the number of vacant retail sites currently available for lease. The effect of on-line shopping is starting to be felt by high street retailers. The imposition of additional costs on retailers (passed on from landlords) could create a make or break situation for those retailers already working with close margins.

It was also noted during this interview that the CBD environment has quite different precincts. Lambton Quay and Willis Street are characterised by high end shopping and, due to the rents along these streets are predominantly occupied by nationwide chain stores. Courtenay Place represents that main entertainment precinct and Cuba Street is characterised more with independently owned stores, bars and cafes. What customers look for and expect to find in these areas are different so it was hard to know how it would be possible to extract funding from these different businesses in an equitable way.

Newtown Business Group

- Represents approx. 200 business – mostly businesses with a 'shop front presence'
- Mix of owner/operator businesses with small business being the predominant scale of business.

There are a number of factors influencing the current economic climate for businesses in the Newtown town centre area. Of most relevance is the high number of heritage listed, and earthquake prone buildings. Ability to have adequate and affordable insurance cover is a key area of concern for businesses. On-line retailing is also having an impact. A possible emerging trend is that the retailing mix is changing with a greater focus towards food and service outlets. The combination of these factors affects the current economic climate for retailers and landowners as costs of owning and running the business are increasing, while income remains static.

There was support for the concept of a public transport terminal in the heart of the Newtown centre, but the interviewees were uncertain as to the extent for the spin-off benefits for surrounding retailers. It was noted that the scheduling of services was likely going to affect the extent to which people would visit nearby shops.

Retention of free on-street parking is a key issue for retailers here as this supports the viability of their businesses as it encourages people to shop and/or be entertained locally.

Overall, any funding option that would lead to an increase in business costs is likely to be opposed by this business community, given current trading conditions.

Kilbirnie Business Group

- Contact list of approx. 190 businesses.
- Very wide mix of businesses – from small scale individual operators up to nationwide retailing chains, visitor accommodation.

Though the Kilbirnie town centre is not affected by heritage and earthquake prone buildings to the same extent as neighbouring Newtown, the town centre businesses are also finding the current trading conditions difficult. They face increased competition from the Airport Retail Park (large format retailing) and shopping malls located in other parts of the region. There is not much redevelopment occurring at present and most sites are generally fully occupied. The economics of building higher than 2 stories were questioned (i.e. requiring lift access).

It was acknowledged that there could be some benefits from a PT terminal in Kilbirnie, but the benefits would more likely be focused on 'quick stop' type retailers such as dairies, rather than being spread evenly across the entire town centre. Most businesses in the centre are closed by 5:30 (when a possible influx of commuters might occur on homeward bound journeys).

As with Newtown, retention of free on-street car parking is considered a vital ingredient to support the local retailers.

There was little support for any funding options that would result in increased costs to tenants, especially where there was no certainty that business income would improve.

Appendix Five: Central City Car Parking

Table: Description of current parking in Wellington

Type of parking	No. of spaces	Appropriateness for a levy	Administration
Short-stay, on street metered parking in CBD and Oriental Bay	Approx. 3,500 metered spaces	<p>Short stay parks designed to provide access to retail, business and entertainment opportunities. These car users do contribute to CBD traffic at all times of day, but car trips during interpeak (9-4pm) less likely to contribute to congestion.</p> <p>Nominal (smaller proportion) levy could be appropriate.</p>	Simple as charging scheme already in place, though fee increases would need to be agreed through usual council process.
Off street car parks (i.e. on private land in CBD) <ul style="list-style-type: none"> • Commercial parks • Private parks 	Approx 11,000 car parks available to the public Approx 17,000 private car parks	<p>Yes. On the basis that a high proportion of private car parks used by commuters.</p> <p>Parks either on a public commercial basis (daily charges, short or long term leases) or spaces are held privately for building owners (i.e. their employees or for leaseholders etc).</p> <p>Some off street parking contains a mixture of private and commercial parking; the proportion of which could change daily depending on parking needs of building occupant (i.e. hotels)</p> <p>Exact proportion of private car parks used by commuters unknown. Accept that some car parks used for visitors.</p> <p>Random sample of casual parking charges across Wellington CBD range show:</p> <ul style="list-style-type: none"> • Early bird: range from \$9 – \$20 per day, av. \$12.50 • Casual: range from \$2 – 12 per hour. Most common is \$4 per hour. • Monthly: Range from \$230 - \$250 a month (plus GST) in core CBD <p>Short stay users of off-street car parks could be charged same proportion of parking levy as on-street park users.</p>	Complex. Expect levy to be applied to all building owners based on number of parks. Upfront administration costs in having comprehensive parking survey completed. Database able to be kept up to date simply from building consent records which would depict car parking spaces. Levy applied universally through a special rate. Would expect levy to be passed onto park users through lease agreements or increased fees to casual users, though literature findings show that levy not always passed on due to competition.
Coupon car parks <ul style="list-style-type: none"> • This scheme aims to make parking available for shoppers and 	Approx 3656 spaces available <i>(nb. last surveyed in 2009)</i>	No. The parks are mostly located on fringe of CBD and users of those parks do not contribute to CBD congestion. Users of car parks walk or take public transport to complete their journeys into	n/a

<ul style="list-style-type: none"> visitors to the city. Coupon parking zones are in the areas on the fringe of the central business district 		<p>town.</p> <p>Existence of these spaces (and use of them by car users) cuts down on traffic that would otherwise enter the CBD</p>	
<p>Residents parking spaces</p> <ul style="list-style-type: none"> Residents parking areas typically located in the inner residential areas surrounding the CBD. Residents parking permit costs \$115/year 	<p>Approx. 2176 spaces available <i>(nb. last surveyed in 2009)</i></p>	<p>No.</p> <p>These spaces are intended to provide on street parking for inner residential suburbs, which historically lack off street parking as part of the development. Majority of these residents either walk or use public transport to access CBD.</p>	n/a

Appendix Six: Summary of a variety of PT projects and associated land value uplift

From: Appendix G: Land Impacts from Investment in public infrastructure

Gold Coast Light Railway Concept Design and Impact Management Plan

Sourced from:

<http://goldlinq.com.au/workspace/assets/uploads/resources/volume-2-appendices-4cd89504.pdf>

Appendix G Summary of Results - Land Impacts from Investment in Public Transport Infrastructure

Source	Case/Location	Impact of	Impact on	Impact
[1] APTA (2002) after Diaz (1999)	North America	Proximity to rail (heavy and light)	Residential and commercial property values	In general, positive (via accessibility values)
[2] APTA (2002) by Weinstein & Clower (1999)	DART (Texas)	Proximity to DART/LRT station	Property values	Positive +25%
			Class A office	+
			Class C office	+
			Strip retail	+
			Class A occupancy	80% 1994 to 88.5% 1998 (+11%)
			Class A rent	\$15.6 to \$23/sqft (+47%)
			Strip retail occupancy	+49.5%
			Strip retail rent	+64.8%
[3] APTA (2002) by Cerveno & Duncan (2002)	Santa Clara California	Walking distance of LRT	Commercial land values	Positive +\$4/sqft (+23%)
		1/4 mile of CalTrain station	Commercial land values	+\$25/sqft (+120%) above mean
[4] APTA (2002) by Gruen & Associates (1997)	Chicago	Proximity to transit (MTA/Metro)	Value of single family homes	Positive
			Apartment rent value	Positive
			Apartment occupancy	Positive

Source	Case/Location	Impact of	Impact on	Impact
[5] APTA (2002)/ Armstrong (1994)	Boston	Community with a computer rail station	Single-family residential property values	Positive +6.7%
[6] APTA (2002)/ Sedway Group (1999)	San Francisco Bay Area	BART	Value of single family homes	Positive \$3200 to \$3700 depreciation per mile distance from BART station
			Apartment rental	Positive +15% to 28%
			Land price for office properties	Positive \$74/sqft within ¼ mile \$30/sqft over ½ mile
[7] APTA (2002)/ Cerveno (1994)	Washington, DC & Atlanta	Systemwide ridership	Average office rents	Positive
		Joint development near rail station	Annual office rents	Positive +\$3/grsqft
			Office occupancy rate	Positive
			Share of regional growth	Positive
[8] Chesterton (2000)	London JLE	Set radii from the stations – 1000m and 3000m	Residential Commercial	Capital values – positive Occupancy levels from estate agents, developers and investors perceptions – positive

Source	Case/Location	Impact of	Impact on	Impact
[9] Chesterton (2002)	London JLE	Set radii from the stations – 1000m. Note that impact greater where rail infrastructure was poor – 25% increases in 7 out of 10 stations	Residential Commercial	Capital values – positive, but variable. Highest for maisonettes and flats
[10] Pharoah (2002)	London JLE	Note that sites close to stations are more attractive to commercial and mixed use developments, and those further from stations more attractive for residential developments.	Residential Commercial	Occupancy levels from estate agents, developers and investors perceptions – positive
[11] Wrigley and Wyatt (2001)	Review Paper	Multi sector	Residential and commercial property values	Development applications – variable impact by accessibility, potential and development history – positive, but in limited areas
[12] Hillier Parker (2002) (projected)	London Crossrail	Assumed impact area set at 1km from the stations	Commercial	Sites close to stations sought for mixed use and commercial developments
[13] Henneberry (1998)	Sheffield Supertram	Assumed impact area at 1km along either side of line	Residential	Intra urban and regional, capturing agglomeration and network effects
[14] Dabinett (1998)	Sheffield Supertram	LRT	Residential property values	Additional floor space of 10.87 million sq metres by 2025
[15] Dabinett (1998)	Sheffield (& Manch.)	LRT	Non residential Property value	House prices reduced with anticipation of construction of tram lines, but negative impact disappeared after opening
[16] Laasko (1992)	Helsinki	Metro and Rail	House Prices Values	Unable to identify any discrete Supertram influence Influence so small that it cannot be separately distinguished
				Overall +\$550- \$650 million gain in value (US\$, 1990 prices)