

Appendix A: Benefits map

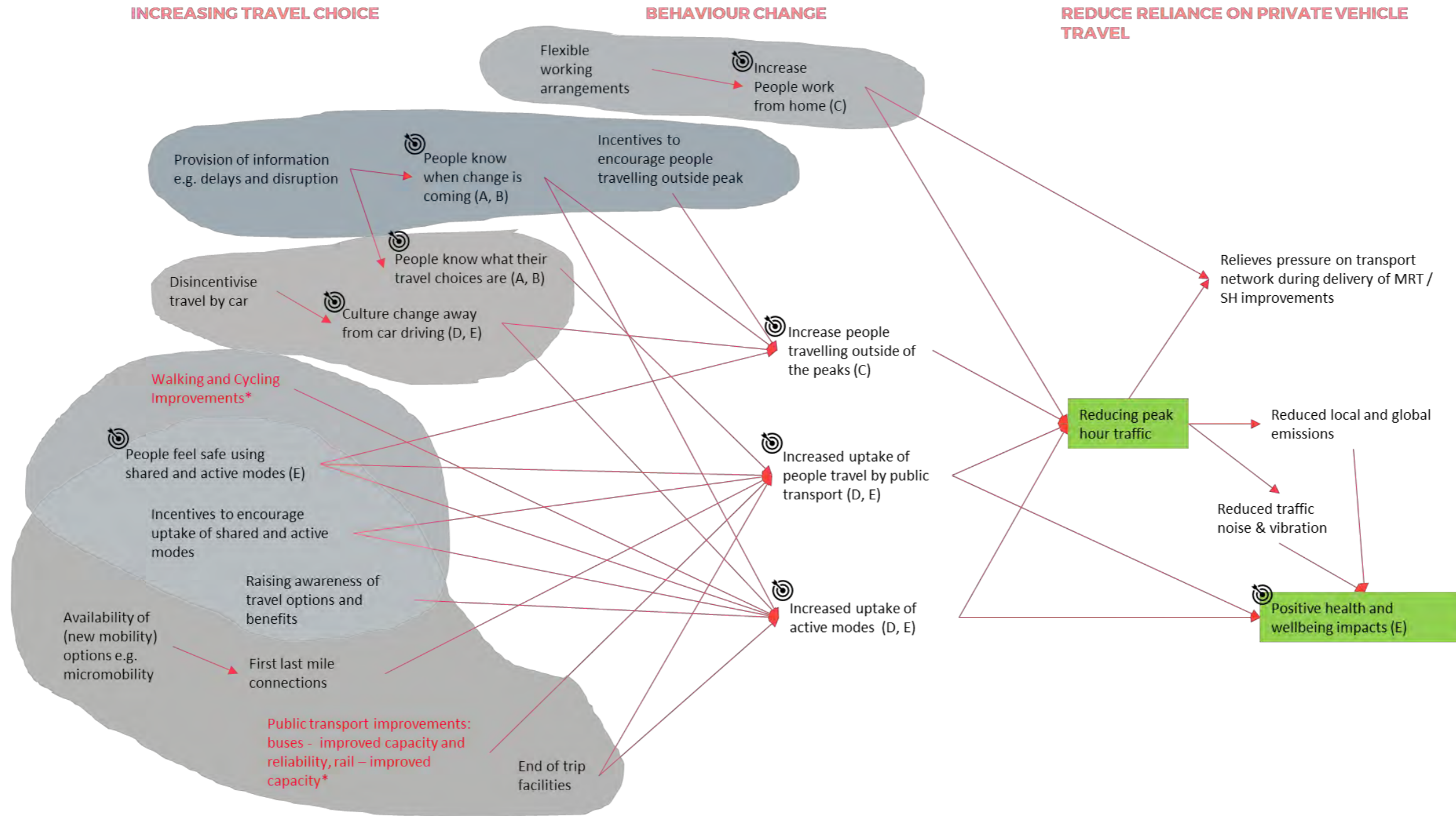
LGWM TBC Package: Benefit Map

BENEFIT	INVESTMENT BENEFIT	MEASURE	DESCRIPTION	BASELINE	TARGET	
Less traffic in the city centre	More people using active modes	Access – Perception (active modes)	Perception of safety and ease of walking and cycling through customer and travel surveys	52% perceive the overall state of cycling in Wellington to be good based on a survey of 500 people in 2018 (May 21st – June 24th 2018)	To be confirmed Value Mm/yyyy	
		Mode share	JTW Mode to Wellington CBD (2018 GWRC analysis, 2018 Census data) TTS mode share for Wellington Region (2018 Census data)	National Travel Survey - JTW Mode to Wellington CBD : drive 35%, bus 20%, rail 20%, walk 20%, cycle 5% Census - TTS: Wellington Region - 34.6% passenger in vehicle, 25.8% walk or jog, public bus 9%, drive vehicle 7.6%, study at home 5.9%, train 5%, bicycle 2.9%	To be confirmed Value Mm/yyyy	
	More people take public transport	Nos. using active travel and PT	Central city annual cordon counts	2019 Cordon counts: Pedestrians 10,587; Cyclists 1,862 Public Transport (Rail, Bus, Ferry, Cable) 29,748 Vehicles (cars, motorbikes, vans, taxis, light and heavy trucks) 27,377	To be confirmed Value Mm/yyyy	
		Access – Perception (Public Transport)	Metlink customer satisfaction surveys (bus and rail)	91% of customers are satisfied with the public transport in Wellington. 93% of train customers are satisfied and 90% of bus customers are satisfied (Nov 2019)	To be confirmed Value Mm/yyyy	
	make best use of the transport network	Vehicle occupancy	Average number of people per vehicle (for trips to the city centre)	Private vehicle occupancy was 1.36 in 2019	Peak period private vehicle occupancy 1.45 by 2025	
		People working from home	Calculated from TTW 2018 census (people with employment location in Wellington City)	Wellington Region 9%; Wellington City 8.1% 2018 Census	To be confirmed Value Mm/yyyy	
		Peak intensity	Weekday traffic, bus and rail peak intensity as proportion of daily demand	To be confirmed Value Mm/yyyy	To be confirmed Value Mm/yyyy	
		Physical health benefits from active modes	Increased activity levels (as monitored in the NZ Health Survey)	NZ Health Survey Wellington Region 2014-17 Physically active 55.1% Highly physically active 48.5% Little or no physical activity 9.5%	To be confirmed Value Mm/yyyy	
	Improve community health and wellbeing	Improved community health and wellbeing	Social connectedness	no. personal connections within communities	Collect baseline data as part of the 'Neighbours day' initiative; phone survey/ geo-fenced social media campaign	To be confirmed Value Mm/yyyy
			Social connectedness	no. people who know their neighbours	Collect baseline data as part of the 'Neighbours day' initiative; phone survey/ geo-fenced social media campaign	To be confirmed Value Mm/yyyy
Tonnes of CO2 equivalent emitted*		Reduction in tonnes of CO2 equivalent emitted* (regional)	1,655,812 tCO2e May 2020 (2019 emissions)	To be confirmed Value Mm/yyyy		



Appendix B: The relationship between benefits and objectives

The benefit map below demonstrates the interplay between the investment benefits and objectives .



Key:

- * being delivered outside the scope of this project
- 🎯 Investment Objectives (X refers to objective A-E on the right)
- 🟩 Investment Benefits

TBC package objectives (for reference purposes)

- A. improve access to and through the central city ensuring people know that the available travel choices will work for them
- B. minimise disruption to people and business by making sure they are aware of upcoming changes, how it will affect their journeys and understand their travel options during delivery of work to improve and renew the city
- C. make best use of the transport network by encouraging people to travel less often and at less busy times
- D. make best use of the available transport options by reducing the proportion of people that drive alone during busy times * or for short trips
- E. improve the health, safety and wellbeing of communities by increasing the number of trips that involve active modes and public transport

Appendix C: Ministry of Transport guidance on travel behaviour change

Travel Demand Management (TDM)

The application of strategies, policies and interventions (infrastructure and non-infrastructure) to create and manage (passenger and freight) transport system capacity by redistributing trips across a variety of transport modes and routes, at a range of times, or by removing them completely.

TDM OUTCOMES – THE FOUR Rs



RE-MODE (MODESHIFT)
Changing the mode of travel people use from private vehicles to public, active and micromobility transport modes



REDUCE (TOTAL TRIPS / VEHICLE KILOMETRES TRAVELLED)
Reducing the number of (primarily) private vehicle trips on the network (eg increased working-from-home, car-sharing)



RE-TIME
Encouraging travel at different times of the day (e.g. increased off-peak travel for commuters and freight)



RE-ROUTE
Encourage / require people to avoid (primarily) driving on specific routes (eg outside schools at certain times of day)

TDM CAN CONTRIBUTE TO A NUMBER OF BENEFITS

1. Reduced greenhouse gas emissions and improved local (street level) air quality
2. Reduced transport-related fatalities and injuries
3. Improved public / mental health outcomes through increased physical activity
4. Economic efficiencies, cost savings, and recovery
5. Improved neighbourhood / street level liveability and amenity
6. Improved land-use integration and removed need for some road infrastructure
7. Improved access to opportunities
8. A more efficient and optimised transport system
9. Provide people with a greater range of transport options

TDM MEASURES ARE BETTER APPLIED IN COMBINATION – FOR EXAMPLE

Investment: dedicated bus-lane and separated cycle way on a congested corridor
Pricing: a congestion charge administered along the corridor
Information: campaign to raise awareness of new charges (what, where, why, how) with information about improved alternatives to the private vehicle travel
Incentives: Free/discounted bus pass and e-bike subsidy

TYPES OF TDM LEVERS

Coordinated Strategic Planning

eg coordinated and aligned goal setting across different government strategies to ensure key outcomes are met

Specific Plans, Policies and Regulations

eg transport pricing, emissions regulations, travel plans, removal of minimum parking requirements and parking management, flexible working

Integrated Transport / Land-use Planning

eg transit-oriented development, master-planned development that encourages alternatives to private vehicle ownership and single occupant travel

Capital Works and Service Improvement

eg new or improved public transport infrastructure and services, walking/cycling paths, cycle parking, car-share services

Information and Promotion

eg Mobility as a Service (MaaS), journey planning apps, social marketing including direct and mass

TDM methods can be categorised in polarised ways - incentives and disincentives, push and pull, sticks and carrots. The most effective TDM approach is the application of both categories together as people do not respond to methods uniformly.

TDM, where possible, should undertaken in a cross-sector manner as levers do not always sit within transport organisations and benefits are broad (eg addressing school travel challenges requires collaboration with the education sector).



Draft TDM Principles

1. The '4 Rs' (desired travel outcomes) should guide transport (and related) policy, planning and investment decisions
 - Re-mode - Changing the mode of travel people use from private vehicles to public, active and micromobility transport modes
 - Reduce - Reducing the number of (primarily) private vehicle trips on the network (eg increased working-from-home, car-sharing)
 - Re-time - Encouraging / requiring travel at different times of the day (e.g. increased off-peak travel for commuters and freight)
 - Re-route - Encouraging / requiring people to avoid (primarily) driving on specific routes (eg outside schools at certain times of day)
2. Opportunities to achieve Re-mode and Reduce outcomes should be considered ahead of Re-time and Re-route
3. Integrated land-use and transport planning be undertaken to achieve the '5 Ds' built environment outcomes
 - Destinations – Major destinations and centres located at public transport stations (eg Transit Oriented Development) or along corridors
 - Distance – A walking network that enables fast, safe and direct walking connections to various opportunities and public transport services
 - Density – Higher levels of residential and employment density to support more local amenities within walking and cycling distance, and justify high levels of public transport service
 - Diversity – A diverse mix of land uses and housing types makes it easier to live, work, shop, and play without having to travel far
 - Design – Well-designed buildings and public realm create places that feel interesting, pleasant and safe to walk or cycle in
4. To improve effectiveness, interventions should be applied in combination and in a manner that reflects specific contexts and stated objectives (eg infrastructure improvement, pricing and marketing) – there is no silver bullet
5. Planning and construction of new developments and neighbourhoods must:
 - cater for multi-modal access, both internally (if large-scale) and externally, as applicable
 - be designed in ways that discourage single occupancy vehicle dependency e.g. car share car parking is planned from outset.
6. Interventions should where possible (and equitable) seek to reduce vehicle kilometres travelled (VKT) on the network
7. TDM should be considered and undertaken (as much as possible) in a cross-sector manner because levers do not always sit within transport organisations and benefits accrue for other sectors (eg economic, health and education) too
8. To encourage sustainable travel and reduce GHG emissions the low carbon transport hierarchy should be applied to policy, planning and investment decision-making
 - Walking > cycling > micromobility > public transport > electric car > petrol/diesel car > air

Appendix D: Significant Projects in the Wellington Region over the next 15 years

The table below identifies critical projects being delivered over the next fifteen years and the impact they will have on the TBC package being delivered as part of this workstream.

While a project is yet to be established, GWRC will also working to facilitate availability of technology and apps to support shared or active mobility choice and parking management tools. It understood that this project will be completed before 2025.

Project	Planned years until completion	Links or dependencies with the TBC outcomes
Central City Pedestrian Improvements	1	This project will make walking safer and faster for pedestrians through adjustments to traffic signals and other relatively small changes to improve pedestrian safety.
*Golden Mile	2–3	The Golden Mile is the busiest part of the Wellington central city and is also the main bus route. The Golden Mile project is focused on improving this section of road for pedestrians, cyclists and buses. The project provides opportunity for mode shift for people traveling to/from and through the central city and improved safety.
*Thorndon Quay & Hutt Road Improvements	3–4	This project will deliver priority for buses with improvements for walking and cycling including enhanced safety. It will provide an opportunity to people travelling to the central city from northern suburbs to change their travel behaviour.
*City Streets	3–7	This project involves road space reallocation and improvements on streets within the central city and along radial routes in order to provide access to the central city from surrounding suburbs to enable the transport system to move more people with fewer vehicles and to improve access for all modes. The TBC package needs to be developed with an understanding of the bus priority plans and provisions proposed for cycleways and pedestrians. The construction of City Streets will also create disruption in the normal transport network which is an opportunity for TBC.
*Mass Rapid Transit (MRT)	10–15	This project is to deliver an MRT system from Wellington Railway Station, through the central city and to the south and east of the city. (the final route is still to be confirmed). MRT is a new opportunity for mode shift as it may relieve capacity on cycleways and buses. The construction of MRT will also create disruption in the current transport network which is an opportunity for TBC.
*Parking Levy	5–10	This project has the potential to enhance mode shift by acting as a catalyst to stimulate organisations to review fleet or parking benefits, provision and policies. The opportunity for TBC as a result of the levy would need to be harnessed by delivering a package of interventions built on behavioural economics principles to influence commuter behaviour
*Strategic Highway Improvements	10–15	This project is tasked with unblocking congestion on SH1 particularly around the Basin Reserve, with the possibility of a second Mount Victoria Tunnel (final route to be confirmed). The construction of Strategic Highway Improvements will create

Project	Planned years until completion	Links or dependencies with the TBC outcomes
		disruption in the current transport network which is an opportunity for TBC.
Transmission Gully	1–2	The construction of a four-lane motorway running from MacKay's Crossing to Linden through Transmission Gully will significantly cut journey times from the Kāpiti Coast to Wellington City. It is expected that the opening of the motorway will shorten travel times by road and lead stronger growth in the north of the region. Transmission Gully and other significant transport projects that connect Wellington City to the wider region allow people to live further away than they may have otherwise.
National Integrated Ticketing Programme	2 (rollout in Wellington)	This project, also known as Project NEXT, is to establish a nationally consistent integrated ticketing system for public transport. A new ticketing system would supersede the Snapper cards, encouraging public transport patronage and contributing to mode shift due to the simplification of multi-modal travel.
Bike Racks on Metlink Buses	Ongoing	All new Metlink buses added to the fleet will come with a bike rack to safely carry two standard bikes. Plans are in place to retrofit the interim with this feature. This would support multi-modal transport and would improve the perception of being a more reliable way to travel.

*To be delivered as part of the LGWM programme.

Appendix E: Travel behaviour trend sources

- Travel Demand Management Customer Insight Survey (Nexus 2019b): 1404 respondents in the Wellington region (aged 15+), 15-minute online survey
- Wellington Commuter Parking Levy Draft Survey (LGWM 2020b): A random sample was drawn from 40,000 phone numbers in the Wellington Region (including mobiles) Of these, 1,500 respondents agreed to participate in the survey,
- In late 2019, Wellington City Council undertook a parking survey that was emailed to the council's "secondary online panel". There were 2,225 self-selected respondents who were not necessarily representative of all CBD users.
- Greater Wellington Regional Council (GWRC analysis, 2018 Census data): Primary analysis of 2018 Census data by the Wellington Analytics Unit at Greater Wellington Regional Council
- TomTom data (TomTom 2019): real traffic data in Wellington
- NZ Household Travel Survey (MoT 2020), only limited information from the 2018 travel survey was available at the time of writing this business case
- Regional Mode Shift Plan (WKNZTA 2020a)

Appendix F: Case study summary

Our team completed case studies of 32 regional/citywide TDM schemes and individual TDM programmes. Of these, we selected 12 that show the most relevance to the Wellington effort, and whose evaluation methodology was (unlike many) rigorous and defensible. The case studies selected also reported on the reduction in single occupancy vehicle trips.

Case Study name	Outcome	Type of initiative	Supporting infrastructure
Case Study: Seattle Children's Hospital	This comprehensive TDM campaign at a hospital campus achieved a reduction of 6% in single occupancy vehicles (SOV) trips over 10 years and indicates sustained change. As a condition of approval to do a large-scale expansion on site, the City of Seattle required the hospital to commit to reducing their drive-alone employee mode share from 38% to 30% between 2008 and 2030, and the hospital is on track to accomplish this.	Travel plans	Major transit investments; served by premier bicycle path in the region. Surrounded by affluent residential region, making offsite parking difficult.
Case study: Santa Monica TDM	Santa Monica, a Blue Zone ²⁸ with a leading micromobility offerings, light rail and active transport amenity, implemented a mandatory employee commute reduction plan, monitoring, and reduction in fees if targets were met. The first year of implementation achieving a 4% reduction in resident drive alone rates.	Mandated employee commute reduction plan, monitoring, reduction in fees if targets were met, 'Blue Zone' initiatives	Leading city on micromobility (e-scooters, bike share); new light rail line opened in 2016; outstanding bicycle and pedestrian network.
Commuter Connections, Washington, USA	Collaborative regional programme in greater Washington DC area which has an excellent, but challenging subway service, strong cycling infrastructure and programmes. In three years between 2014-2017, the programme achieved a reduction of 14% in vehicle trips.	Targeting commute to workplaces	Excellent but troubled subway service; strong bicycle path network; improvements in on-street bicycling facilities but conditions still stressful; excellent bike share; congestion is very challenging.

²⁸ **Blue Zones** are regions of the world where Dan Buettner claims people live much longer than average. Through a project funded by the health sector, Blue Zone principles were retro-fitted into some California suburbs and the programme achieved increases in active travel- see bluezones.com for more information.

<p>GoDCGo TRANSPORTATION PROGRAM, Washington, DC USA</p>	<p>This programme in Washington, DC The programme overall achieved a reduction of 45,500 vehicle trips over the reporting period of 2018-19.</p>	<p>Focus on hotel guests, schools, commuters, workplaces and residential areas</p>	<p>Excellent but troubled subway service; strong bicycle path network; improvements in on-street bicycling facilities but conditions still stressful; excellent bike share; congestion is very challenging.</p>
<p>Arlington Mobility Lab and County Commuter Services, Arlington, VA USA</p>	<p>A collaborative multi-party community wide programme reduced number of daily trips between 32,940 and 63,038.</p>	<p>Regulatory and soft measures</p>	<p>Excellent but troubled subway service; strong bicycle path network; improvements in on-street bicycling facilities but conditions still stressful; excellent bike share; congestion is very challenging.</p>
<p>Austin TDM Programme, Austin, TX USA</p>	<p>In 2017, the overall programme led to a 3.7% decrease in driving trips. City of Austin employees can earn additional vacation time by not driving to work. The Austin TDM programme is relatively new, energetically implemented, and a departure for this very auto-oriented region.</p>	<p>Regulatory and soft measures, increasing availability of transit, bicycle, and pedestrian infrastructure to increase travel by these modes.</p>	<p>Austin is sprawling and auto-oriented and has experienced crippling congestion as the population has grown. Non-SOV mode share is low but growing, and the city is making transit and bicycling investments.</p>
<p>The Mayor's Commute Challenge, Durham, USA</p>	<p>High-quality research testing the impact of personalised commute journey planning. During the initial test, delivering the journey planning to council employees resulted in a 9.3% reduction in SOV and a 9.3% increase in sustainable. A subsequent trial sending personalised journey plans to University students at North Carolina Central University led to a reduction in SOV of 7.1% and a 6.5% increase in sustainable</p>	<p>Automated journey planning</p>	<p>Durham is part of the sprawling Triangle Region, which is auto dependent and has poor transit and bicycling infrastructure.</p>

	trips. The journey planning is automated, allowing for large-scale scaling.		
Seattle King County In motion TDM programme, King County Metro, USA	Over 12 years, this series of residential TDM campaigns saw a self-reported reduction in drive-alone trips among participants; over 18 different programmes, the majority resulted in a reduction in drive-alone trips ranging between 12 to 25 percentage points.	All trips all modes	King County Metro's transit offerings are quite good and have grown better in the last few years thanks to investment and smart planning. Cycling infrastructure varies a great deal depending on the specific location in the county.
Sydney Travel Choices, Sydney, Australia (TNSW, 2020)	Since 2015, the TDM programme (implemented over a period of disruption to the public transport network) which relied on participation of 850 businesses, achieved a 13% decrease in the number of vehicles entering the CBD in the morning peak.	Commuter trips	Comprehensive public transport network, growing walking/cycling infrastructure, heavy reliance on motor vehicles for short distances (within a 10km radius of Sydney's CBD)
Sustainable Travel Towns, UK (DoT, 2010)	Over five years, reduction of 7-10% in the number of car driver trips per resident. Soft measures were more effective when they were delivered alongside public transport improvements.	Combination of PT, walking, cycling infrastructure and soft measures	Public transport network, varying quality cycle networks

<p>Model Communities project, New Zealand (NPDC, 2020)</p>	<p>Over two years, the initiatives observed a 44% decrease in cars at schools, 12% decrease in cars at workplaces. 30% increase in active travel compared to control sites.</p>	<p>Combination of walking, cycling infrastructure and soft measures</p>	<p>Public transport network, moderate level of walking and cycling infrastructure</p>
<p>From 5To4: promoting smart mobility to employees, Europe</p>	<p>The game succeeded in changing the travel to work behaviour of employees. The modal share of private car reduced from 65% to 42%. The game reached 100,000 employees with 23,400 players directly in the game</p>	<p>Gamification</p>	<p>Varying levels of public transport and cycling in the five participating towns</p>

Appendix G: Wellington Commuter Parking Levy, Final Report, March 2021



18 March 2021

Wellington Commuter Parking Levy

Final Report

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Quality Control

- V4 Final Report 18/03/21.
- Authors – Candor3, RCG, Martin Jenkins, ptc, Russell McVeagh and Curia.
- Internal Team Review - Cristina Lynn/Mary Seymour ptc -.26/10/20.
- TWG Review – 27/10/20 and 10/3/21.
- LGWM Independent Peer Review – vlc 8/12/20 and 1/3/20
- Checked by – Colin Shields Candor3 18/03/21.

Executive Summary

Overall Conclusion

Background

The aim of the Wellington Commuter Parking Levy is to reduce the number commuters driving and parking in the CBD in the AM peak by placing a charge upon the use of commuter parking places to encourage car park occupiers/operators to reduce the number of commuter parking places provided. Importantly it also provides WCC with a ring-fenced source of revenue to fund LGWM package of measures to improve accessibility by walking, cycling and public transport.

The Parking Levy Study had a clearly defined scope. Ministerial political direction meant that consideration of alternative (to a Parking Levy) demand management approaches or solutions to the defined problem were out of scope for the Parking Levy study. Furthermore, the RFP for the Parking Levy study was prescriptive in terms of:

- The boundary of the study being the Wellington CBD.
- Parking levy would apply to commuters only.
- Parking Levy would apply to off street car parks in the CBD only.

The purpose of the Parking Levy study was to:

1. Carry out research into the potential effectiveness of a Parking Levy in Wellington CBD and:
2. If the assessment suggests that it would be effective, then how it might be feasibly implemented to meet the objectives of LGWM.

Assessment of Parking Levy against Evaluation Criteria

Using the evaluation criteria identified for the Parking Levy, we draw the following conclusions:

- Strategic Fit - The Parking Levy aligns with its objectives of:
 - Reduce the number of vehicles entering the CBD in the AM peak - the Parking Levy is predicted to reduce this by 10.6%, although this reduction on its own does not meet the 20% reduction as envisioned for the LGWM packages of work.
 - Provide a potential revenue source for funders – achieved with a gross return of circa \$28m p/a.
 - Improve network efficiency – achieved with predicted congestion reduction benefits of \$2.8m to \$10.4m, exceeding the economic costs. By removing car trips, public and active transport accessibility is improved.
 - Equity – our analysis of various indicators confirms that a Parking Levy would be broadly equitable: it performs strongly in terms of vertical equity, and relatively well in terms of horizontal equity.
 - Reduce Carbon emissions – the reduction in peak vehicle traffic and associated mode shift means the Parking Levy is highly likely to lead to reduced carbon emissions

- **Acceptability/Feasibility** – The Parking Levy will require legislative changes which could be challenged politically (given previous opposition in New Zealand to introducing Fringe Benefit Tax on car park spaces provided as part of an employment package). To be feasible, the Parking Levy needs to be implemented as part of a package of measures ie the LGWM packages (eg public transport and active mode improvements). With these in place, commuter’s acceptability of the Parking Levy will be increased. Based on meetings with stakeholders (including property owners/occupiers and public car park operators) there are likely to be objections but by hypothecating revenue raised into LGWM public transport and active mode improvements, then the Parking Levy is considered to be fully transparent and accountable.
- **Effectiveness** – By charging occupiers and car park operators, the Parking Levy is reasonably straightforward to collect. There will be initial upfront costs to prepare, consult and implement the Levy but, once in place, it 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 direct tool, and not all costs will be passed onto the car park user when the property occupiers and car park operators are levied. Reduced demand for long term car parking spaces in the CBD to be used by short stay non commuters also could allow land/floor space to be used for more productive purposes (e.g. office space). Potential displaced parking impacts on the fringe CBD coupon and residential streets will need to be managed.
- **Affordability** – The annual levy targeted at commuter parking would be affordable with costs likely to be spread between property occupiers, car park operators and motorists.

Overall Findings

The research presented in this report has concluded that:

1. The Wellington Commuter Parking Levy is effective in meeting its stated objectives of a mode shift (albeit lower than the overall 20% reduction in vehicle trips to the CBD in the AM peak which underpins the LGWM package) and generates revenue to invest in the LGWM packages. The indirect benefit of raising revenue which is then used to support LGWM public transport, active modes and travel behaviour change initiatives, although not entirely attributable to the impact of the Parking Levy, it will assist in encouraging mode shift from the car.
2. Our work has indicated a pathway for implementation of a Parking Levy.

On this basis, the Wellington Commuter Parking Levy as presented in this Report is recommended as being included in the LGWM work package.

Specific key conclusions are as follows:

COVID 19 Impacts

COVID 19 and its medium to long term impact on travel behaviours (eg working from home and lower levels of public transport usage) remain uncertain. A key point to note in respect of the Parking Levy (and indeed for other LGWM Packages) is whether there are any long-term structural changes arising from COVID (eg working from home) that actually achieve greater reductions in vehicles entering the CBD in the AM peak. This is outside the scope of the Parking Levy study, but it is recommended that LGWM monitor this and adapt their strategic models accordingly. It is understood that the WAU are looking at sensitivity tests on COVID impacts and it would be useful to incorporate the findings from these tests into the Parking Levy project to ensure robustness of the results. In considering the impacts of Covid it is important to note that Covid could be seen as a potential short-term impact, whilst reducing the number of car commuters parking in the CBD should be considered as a long-term impact. The mode change generated by the Parking Levy as part of the broader programme will also help cater for regional growth. As such it is important not to lose sight of the bigger picture.

Wellington Commuter Parking Levy Objectives

The objectives of the Parking Levy are:

- Encourage mode shift (away from private vehicles) – this will contribute to the LGWM Programme Objective of reduced reliance on private vehicles.
- Provide a potential revenue source for funders – as well as providing a funding mechanism for the LGWM programme of works, hypothecation (ring fencing) of the revenue raised for transport improvements is a key consideration.
- Improve network efficiency - this will contribute to the LGWM Programme Objective of provide more efficient and reliable access to support growth by reducing congestion and improving accessibility.
- Equity which includes vertical equity (eg impact on different socio-economic groups, with different levels of ability to pay) and horizontal equity (eg are the people paying for the policy the same people benefiting from it or mitigate costs?). This will contribute to the LGWM Programme Objective of Liveability.
- Reduce Carbon emissions - the Parking Levy RFP document indicated that emissions are projected to decline due to changes in the vehicle fleet (fuel efficiency and electric vehicles) and the LGWM programme contributes a further 18% reduction in emissions within the CBD with road pricing having the biggest impact on emissions. Although unlikely to be as effective as road pricing in reducing emissions within the CBD, the Parking Levy can be expected to contribute to a reduction in emissions.

Lessons from existing international Parking Levy schemes.

- Commuter surveys have given a range of results, but they all show that a proportion of commuters will switch from driving to other modes in response to a price change.
- Convenience is a big factor in driving/ parking, both for people who currently drive and for those who don't. 9% of Melbourne public transport users stated that they would shift to driving if they had convenient parking, "irrespective of cost". Latent demand may be important i.e. if a parking levy makes driving/ parking more convenient, some public transport users may switch to driving even if they have to pay more.
- Fringe Benefit Tax exemptions for parking have perverse effects: they are regressive in tax terms and encourage driving in the places where this is most damaging. They create a deadweight loss.
- Overseas parking levies have led to an increase in parking costs, with some share of that (typically over 50%) passed on to consumers.
- These higher prices incentivise consumers to change behaviour. The lower return to the parking providers also incentivises them to change behaviour. Levy design can shape these incentives.
- We see this behaviour change through mode shift (fewer drivers or at least a smaller proportion of drivers) and fewer spaces being leased by building users.
- We have evidence that the total number of public/ private car parks has fallen in Melbourne and Perth since parking levies were introduced or since substantial price increases occurred. We have evidence that the effective number of private spaces being used has fallen in Sydney and Nottingham (with suggestive data for Melbourne and no data for Perth).
- For Sydney, the effective number of leased private spaces has fallen by around 20% in the last decade, since the 2009-10 price increase.
- Census 'journey to work' data shows that the number of driving trips over 2006-2016 rose in Sydney and Melbourne and fell slightly in Perth. All three cities saw substantial employment growth over this time, so there was mode shift in percentage terms, even if not in numerical terms.
- It should be noted that the overseas levies don't necessarily aim to reduce the number of people driving, but instead to manage or reduce congestion, or to raise revenue for non-car modes.
- There is no conclusive evidence of parking levies making a significant difference to a CBD's competitiveness, either positively or negatively.
- They do assist congestion and (via hypothecated funding) support mode shift. As such, their effects should be positive in theory, even if they are hard to isolate.

- No growing city, with or without a parking levy, has managed to eliminate congestion. However, the levies have played a role in mitigating congestion and curtailing the number of people who drive, even as total employment has grown.
- Parking levies have usually been introduced as part of a suite of measures, and the way the funds are used is also important. In most cases, the funds are hypothecated for local transport improvements.

Integration of the Parking Levy with LGWM Programme and WCC Parking Policy and District Plan

Integration of the Parking Levy with the WCC Parking Policy and District Plan is considered essential since the Parking Levy needs to be supported with a strong complementary parking policy, reduced or reallocated on street parking and improvements in public transport, active travel and travel behaviour change. The positive combination of the new policies together will need to be considered as they will directly address car commuting effectively as part of the following jigsaw solution:

- Parking Levy – increase cost of parking provision, reduce or encourage change of use and increase car commuting parking costs when passed on.
- Parking Policy- manages different parking provision supply for customer groups (retail, resident, leisure, visitor, commuter etc). The Parking Policy shifts towards demand responsive pricing for on-street where high demand = high price and low demand = lower price. This is intended to maximise occupancy and create appropriate turnover rates depending on the park location. This also supports the user pays principle. The CBD metered spaces would become demand responsive and incremental, therefore, someone could stay all day, if they paid (a premium) for all day parking.
- LGWM Package of measures – Parking Levy revenue delivers a range of high-quality public transport and active travel improvements to provide increased capacity and levels of service and encourage car commuters to switch modes.
- Travel behaviour change including support for businesses and employees (eg workplace Travel Plans and Parking Management plans).
- For future new development in the city, there will be no minimum off-street parking requirement (except for accessible car parks) and the introduction of a Parking Levy could encourage commercial developments to provide limited employee/long stay parking spaces.

Parking Inventory

The parking inventory indicates:

- 27,660 parking spaces in the CBD comprised of 4,329 residential, 1,281 retail and 22,050 'commercial and other' spaces. This third category is the focus of the Parking Levy.
- Of the 22,050 'commercial and other' spaces, 19,575 are part of a property that has 11+ spaces. This figure is conservative, as some carparks are individually titled but owned by the same company/ organisation.
- 2,153 spaces are owned by public/ not-for-profit entities that have a 100% or 50% rates exemption. However, the majority of these are used as paid public parking.
- 10,094 spaces are included in our public parking database, which is a subset of the overall parking inventory.
- Some carparks have switched from 'public' to 'private' and vice versa.
- The 2016 earthquakes led to the removal of at least 2,000 public parking spaces. The number of private spaces has probably risen over time, due to new buildings being developed.

We have also collected current pricing information for Wellington carparks and created a historical price trend series for public carparks over 2007-2020.

As a comparison to the estimated 22,050 'commercial and other' parking spaces, we have looked at 2013 census data which suggests that 22,551 CBD workers drove to work on census day; and at cordon survey data which suggests that 23,000 cars enter the CBD each morning between 7 am and 9 am. The 2018 census figure was 24,699 drivers, but this is not comparable to previous years since this census asked respondents how they usually travel to work, not how (and whether) they travelled to work on one particular day. On any given day, some people won't have gone to work. There were also data quality issues with the 2018 census.

These data sources all measure different things, but they indicate that the 'quantity supplied' and the 'quantity demanded' of parking spaces seem to be fairly well matched at present. There is no obvious oversupply, although it is possible that there was one in Te Aro before the 2016 earthquakes.

Parking Levy Description

In developing the proposed Parking Levy a detailed options appraisal was carried out - following this the preferred Parking Levy proposal has been developed and appraised and is summarised below:

Under the Wellington Commuter Parking Levy, all long-stay (commuter) parking spaces in the CBD will be leviable. A leviable long-stay (commuter) parking space is defined below under the following two types:

Type 1 – Private (employer) off street car parks

The Parking Levy applies to all occupier(s) of premises where private off-street parking spaces (ie that are not available for use by the general public) are occupied by a motor vehicle used by an:

- Employee.
- Regular Business Visitor (eg a consultant, contractor, supplier, agency staff, tradie or other business visitor attending a regular place of work which is any premises that a regular business visitor is parked at and attends on three or more days over a 14-day period).
- Student.

The Levy is a charge made on the total number of leviable parking places provided by an occupier at any one time.

For **Type 1** the following are proposed to be exempt:

- Locations where there are 10 or less parking spaces in total.
- Emergency services vehicles.
- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for customers (the exemption does not apply if the person providing the parking space charges customers a fee for parking in the space).
- Parking spaces allocated for loading/unloading.
- Parking spaces allocated for cycles and motorcycles.

Type 2 – Public Off street Car parks

- All public car park spaces are leviable, with an exemption being made of casual car park spaces that are not used by commuters on a working day. Whether or not a casual parking space has been used on a particular working day by a commuter is defined as any casual parking space unused at 1000 on a working day.
- Where a parking space set aside for the parking of a motor vehicle under an arrangement (usually, a lease or license) which gives a person the use of it to the exclusion of any other parker (a reserved parking space) is not defined as a casual parking space.

The following are exempt:

- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for cycles or motorcycles.

Responsibility to pay the Parking Levy.

- For Type 1 (employer provided private car parks), the occupier of the premises is liable to pay the levy.
- For Type 2 (public car parks), the operator of the public car park is liable to pay the levy.

Parking Levy Boundary/CBD definition

The CBD definition used is the WCC downtown targeted rate boundary.

Scope for the Parking Levy to include existing on street Coupon parking and 10-hour max meter parking within CBD

It is considered appropriate to include these spaces as part of the Parking Levy and complementary WCC Parking Policy because:

- Public perception of WCC: simultaneously levying private commuter car parking providers while exempting WCC controlled commuter and 10-hour max meter car parking could be seen as unfair/hypocritical by the public and jeopardise the success of the Parking Levy scheme.
- It is at odds with the desired outcome of the Parking Levy: While it may represent a relatively small proportion of commuter parking in the CBD, including coupon and 10-hour max meter car parking in the Parking Levy scheme will contribute to the desired outcomes of the programme: discouraging car commuting to the CBD, raising revenue, and prioritising parking for short stay and residents use instead of commuter use.

The Financial Modelling work has not taken into account any increased revenue from pricing changes to CBD Coupon or 10-hour max meter parking spaces.

Lifespan of the Parking Levy

As with the existing Parking Levy schemes, the lifespan of the Wellington Commuter Parking Levy will be indefinitely. This will allow the Parking Levy to fund ongoing investment in public transport, active mode and behaviour change initiatives.

Hypothecation of Parking Levy revenue

Hypothecation (ie ring fencing of the net proceeds for transport projects) of the revenue from the Wellington Commuter Parking Levy to fund LGWM and future transport packages is considered essential to ensure:

- Provide ongoing funding of the LGWM programme.
- Big selling point of the Parking Levy.
- Likely to be more politically and publicly acceptable ie it's not just considered to be another tax.

Management of the Parking Levy

At this stage we consider that the Parking Levy should be managed by Wellington City Council since the boundary of the proposed Parking Levy is wholly within the City Council and it would be preferable to use existing WCC expertise and systems.

Financial Modelling

Proposed Parking Levy Price and Geographical Differences

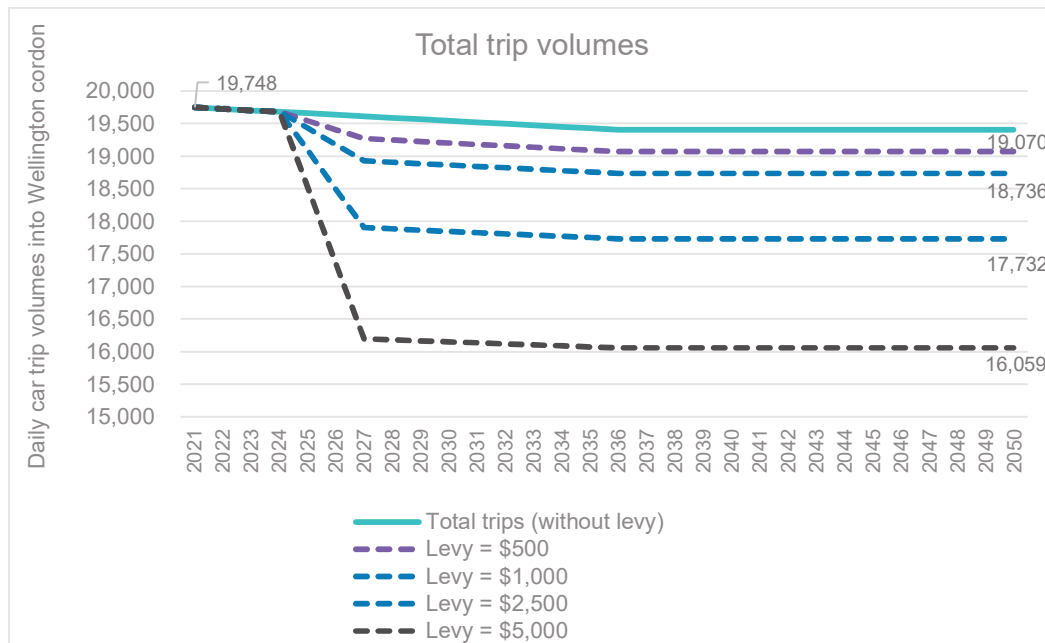
A range of Levy options have been considered (ranging from \$500 to \$5,000 p/a). The preferred option is a levy amount set at \$2,500 per annum in the Thorndon/Lambton Quarter sector and a \$1,750 per annum levy in Te Aro and Pipitea.

Phased Introduction of the Parking Levy

With a proposed introduction year of the levy in 2025 and a three-year phase in period for the levy, it is proposed that in year 1 of operation, only 33% of the full amount of the levy is charged – in year 2, 66%, and, finally, in year 3, 100% of the level of the levy.

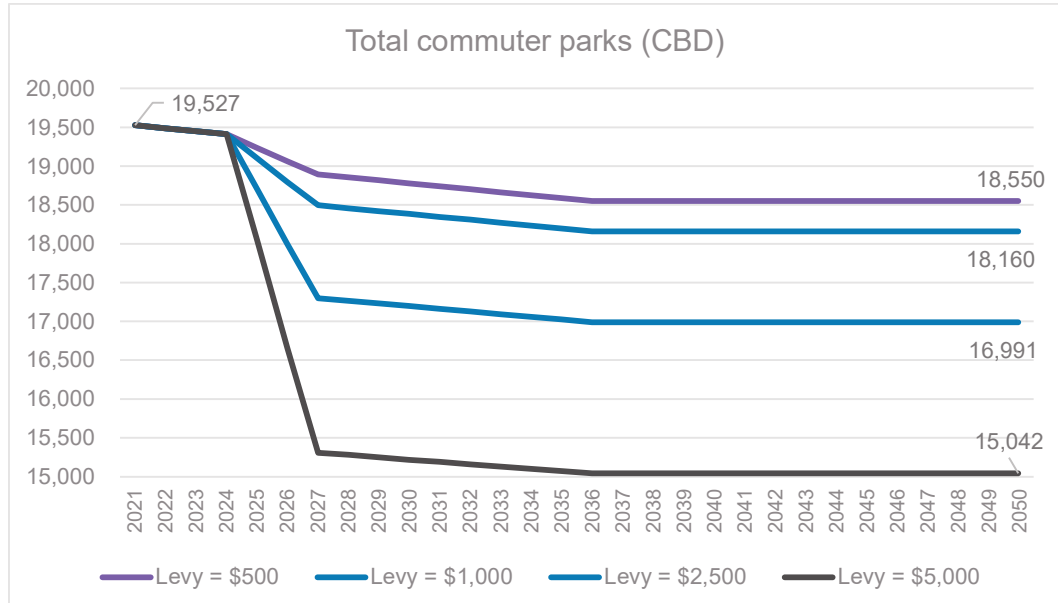
Mode shift impacts

The introduction of a parking levy of \$2,500 alone would be expected to reduce the total volume of car trips from 19,748 to 17,732, a reduction of 2,016 (10.2%) car trips to Wellington CBD each weekday, as shown below with the mode shifts ranging from 3% with a \$500 charge to 18.6% with a \$5,000 charge:



Estimated reduction in leviable car park spaces with the Parking Levy.

The introduction of a parking levy of \$2,500 alone would be expected to reduce the total number of CBD commuter car park spaces from 19,527 to 16,991, a reduction of 2,536 (13%) as shown below:



Displacement of carparking to areas outside of the levy boundary

The model estimates that a certain proportion of commuters would, instead of paying the levy, displace to areas immediately adjacent to the levy boundary. We have not yet modelled the specific locations of this displacement (as this could require this model to be calibrated to AIMSUN, the other transport modelling tool utilised by WAU), but we estimate that with a \$2,500 Levy (and \$1,750 per annum in low-price zones), up to 128 commuters would displace their parking to areas outside of the leviable zone. Work will be required as part of the Parking Levy scheme development to understand supporting parking management plans that may need to be put in place prior to the implementation of the Parking Levy to limit the impact of displaced parking.

Parking Levy Implementation Costs

Total implementation costs are estimated at \$3.76m and are summarised below:

Wellington Parking Levy Establishment cost estimates

- Midpoint above is used in Wellington levy establishment cost estimates.
- Nottingham City Council costs have been inflated to 2020\$ (from 2009\$)

NZ\$, inflated to 2020\$	Levy year 1			Total
	2024	2025	2026	
Public consultation > Approval				
Public consultation preparation	325,733			
Public consultation	465,333			
Parking levy approval	430,433			
Levy scheme development	267,567			
Project management (A)	407,167			
Subtotal	1,896,233	0	0	
Implementation > Operation				
Levy implementation		1,047,000		
Scheme goes live			465,333	
Levy charging commences	0	0	0	
Project management (B)		174,500	174,500	
Subtotal	0	1,221,500	639,833	

Total establishment cost	1,896,233	1,221,500	639,833	\$3,757,567
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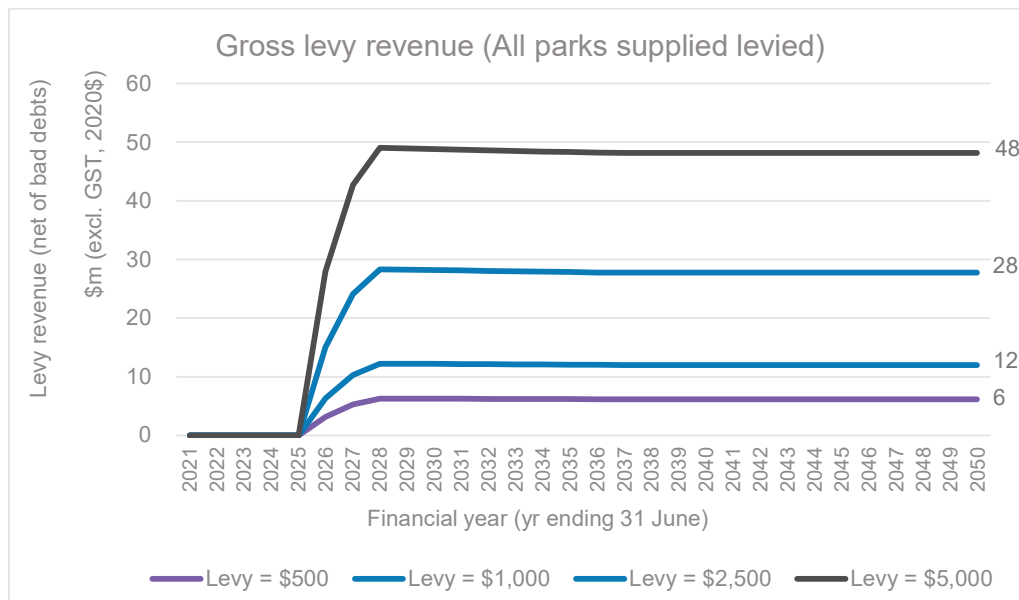
Parking Levy Operational Costs

Total operational costs are estimated at \$1.33m p/ and are summarised below:

Operating costs (NZ\$, inflated to 2020\$)	Levy year			
	2026	2027	2028	Outyears
Parking levy team salaries	\$828,158	\$754,296	\$754,296	\$754,296
IT costs	\$151,224	\$151,224	\$151,224	\$151,224
Equipment	\$69,800	\$69,800	\$69,800	\$69,800
Consultant support	\$232,667	\$232,667	\$232,667	\$232,667
Legal services contingency	\$100,000	\$0	\$0	\$0
Subtotal	\$1,381,849	\$1,207,987	\$1,207,987	\$1,207,987
Contingency (10%)	\$138,185	\$120,799	\$120,799	\$120,799
Total opex	\$1,520,034	\$1,328,785	\$1,328,785	\$1,328,785

Parking Levy Gross Revenue

A Parking Levy of \$2,500 (and \$1,750 per annum in low-price zones) is predicted to generate up to \$28m in gross revenue per annum. Gross revenue per annum predicted for the range of Parking Levy amounts modelled is shown below:



Economic Appraisal

Levy Costs and Benefits

- We estimate total economic costs of \$1.5 million per year for the levy, assessed in 2036. This is made up of administration costs (\$1.6 million), and deadweight loss from the levy itself (\$1.5 million), which is offset by reduced deadweight loss from the FBT exemption for employer provided parking (-\$1.6m).
- The estimates of deadweight losses depend on the assumptions used, but we find that the losses from the levy are likely to be largely offset (or even more than offset), leaving the administration cost as the main economic cost. This finding would need to be revisited if the FBT exemption was removed.

- We estimate congestion reduction benefits of \$2.8 to \$10.4 million, based on some simple ‘rules of thumb’. These benefits will be re-evaluated later in the LGWM programme, following additional transport modelling.
- There are many unquantified benefits, including reduced externalities from driving and parking, freeing up road space for more space-efficient travel modes or alternative land uses, liveability and more efficient public transport.
- Overall, it is highly likely that the congestion reduction benefits alone exceed any economic costs. This means a Benefit Cost Ratio (BCR) of greater than 1 (initial range is 1.9 to 6.9), which is a strong initial argument for a parking levy.
- Lastly, thinking of the levy as a revenue raising tool, we note that funding this revenue from other sources (e.g. general taxation) would create a larger deadweight loss, which is an opportunity cost for those other sources.

Effects on Land Use Patterns, Economic Competitiveness and Agglomeration

- CBD property owners and businesses would bear part of the levy burden, but (assuming levy funds are hypothecated) they also benefit from the funds being reinvested in ways which improve access to the CBD. Overall, the value of CBD land and properties is actually likely to increase, but this will be modelled elsewhere in the LGWM programme.
- Overseas evidence from academic studies, and our own review of economic indicators suggests that the overall economic effects of a parking levy are likely to be positive.
- Using reasonable assumptions, we find that the levy cost is only a very small share of the ‘cost of doing business’ in the Wellington CBD. It is likely to be more than offset by the CBD’s other advantages. This is assisted by the levy funds being used to improve its accessibility further.
- It is highly unlikely that any major displacement of economic activity would occur, as the levy is just 1% of total occupancy costs for a typical office tenant. To the extent that any activity did relocate elsewhere (e.g. a new office building was redirected outside the levy area), this would probably be to elsewhere in the same labour market, i.e. smaller hubs such as Newtown, Kilbirnie or Lower Hutt. There might be some very minor implications for agglomeration, but residents near those areas would also appreciate the local employment opportunities.
- It is extremely unlikely that any major displacement of economic activity would occur to places outside the Wellington region (i.e. Auckland or Christchurch).
- It is quite possible that some workers would work from home some days, rather than driving into work each day. The economic effects of this are uncertain, but likely to be roughly neutral.

Equity

- A parking levy would satisfy vertical equity criteria: it would be predominantly paid by people on higher incomes. Wellington residents, and especially commuters who drive to the CBD, are generally well-placed to bear the levy burden. The median income for people working in the CBD is \$82,000 for drivers, vs \$70,000 for non-drivers.
- Horizontal equity is more complex. Drivers who are passing through, dropping someone off or delivering passengers (i.e. taxi/ Uber drivers) will not pay the levy even though they are contributing to traffic volumes, and this detracts from equity. Drivers who live in certain areas (or who work in certain parts of the CBD) have better alternatives to driving than others.
- Some property owners will bear a larger burden than others, but this is proportionate to their contribution to car commuting. We see this as broadly equitable. Ramping up the levy charge over several years, as proposed, gives property owners more opportunity to reassess their parking provision.
- The Wellington levy’s focus on commuters means that it is appropriate to exclude (short-stay) on-street parking. This would not be equitable in all circumstances, e.g. in the Sydney scheme where short-stay parks are liable if they are off-street but not if they are on-street.

- The equity effects of exempting charitable/ volunteer/ non-profit parking are ambiguous. On the one hand, these groups might be less able to pay. On the other hand, they might still be contributing to peak traffic volumes. Our view is that these carparks should not be exempt.
- The most significant issue for equity, in our view, is that drivers who do not park do not pay. This is a 'free rider' problem. The issue of public/ active transport accessibility can be mitigated by improving access to these areas.
- Despite some issues with horizontal equity, we conclude that overall a parking levy is likely to be broadly equitable.
- Equity can be further improved by exempting disabled spaces; charging a lower rate for Te Aro; looking at complementary measures that target taxis/ Uber; improving non-car access for suburbs where it is currently poor; and giving opportunities for parking owners/ operators to mitigate the levy's impact by keeping carparks empty (or by leaving them available for casual parkers)
- The status quo also has inequities; congestion and high vehicle numbers lead to more noise and air pollution, with the impacts of this mainly felt by CBD residents and those living next to motorways and major roads. This is more likely to affect vulnerable residents, regardless of whether they themselves contribute to congestion.

Unintended Consequences and Other Considerations

- A parking levy will cause the number of car commuters (and parkers) to fall, which reduces congestion, making driving more convenient. This could lead to induced demand for driving, in two ways. Firstly, CBD commuters who do not currently drive (either because it is too slow/ congested or they can't guarantee getting a park) might convert to driving and parking, even if this means paying more.
- Secondly, people who don't need to park in the CBD could be more likely to travel by car because of the clearer roads. This includes people making drop-offs to the CBD, or travelling through the CBD and out the other side, or using taxis and ride hailing services like Uber,
- CBD residents could rent out more of their carparks to commuters if they are able to avoid the levy. This threatens the levy objectives and could have the perverse outcome of more parking being built in apartment developments. Mitigating this, most apartments are in Te Aro and away from the densest employment areas.
- The levy could encourage more people to commute by taxi/ Uber, since the roads would be clearer.
- Some parking owners would be able to avoid the levy by selling off their parks individually or in chunks of up to 10 (depending on the exemption level). The parks will keep being used by commuters, who won't have to pay the levy.
- Our preferred levy design focuses on commuters but means that casual prices could actually fall. This could encourage people travelling off-peak (e.g. shoppers, business visitors and other people to drive rather than use alternative travel modes. On the other hand, this could help to compensate for a loss of on-street parking.

Supporting Measures for a Parking Levy

- Raise parking prices at WCC carparks (especially Clifton) to market levels.
- The Government, WCC and GWRC could reduce the number of carparks they lease, and the number that they provide to staff for commuting purposes.
- Removing on-street parking through other parts of the LGWM programme will mean some casual parkers switch to using off-street parking instead, encouraging carpark owners/ operators to make fewer spaces available for commuters.
- In addition to price-based measures (the parking levy) and behaviour change measures, other measures should be considered to reduce driving during peak times. This could include reallocation of road space.
- Consider changes to the FBT regime to make it more mode neutral.

Legislation/Regulatory Changes

Our preliminary view is that the preferred implementation pathway for a CPL for Wellington is by way of specific enabling national legislation. Bespoke legislation which unequivocally authorises the imposition of a CPL would provide the greatest legal certainty. We consider there is material legal uncertainty as to whether a CPL could be imposed under any existing New Zealand legislation, including, most relevantly, the municipal rating regime. In any event, the rating legislation would not at present provide sufficient flexibility to achieve the objects of a CPL.

We make the following recommendations regarding the nature and substance of a Parking Levy Act:

- It should be a public Act rather than a local Act, although if the preference of Central Government were for a local Act, a local Act should be just as effective a mechanism for implementing a CPL for Wellington.
- If it were considered more desirable and/or expedient to do so, the enabling parking levy legislation could also potentially be introduced as a new part or subpart of an existing Act, such as the Land Transport Act 1998, Land Transport Management Act 2003, or Local Government Act 1974, rather than being a standalone Act of Parliament. (If this approach were adopted, the decision as to which existing statute would be the most appropriate would turn on factors including the Central Government legislative agenda, any support from a particular Minister or Ministry, and views of the Parliamentary Counsel Office.)
- It ought to empower any local authority that chooses to do so to impose a parking levy on all eligible car parks within its jurisdiction and contain a corresponding power for local authorities to exempt certain areas from any levy.
- It should contain embedded exemptions from any levy for certain uses.
- It ought to allow for a local authority to set the rate of the levy, potentially on a differential geographic basis.
- It will need to provide for the procedural and enforcement aspects of administering the levy.

A consequential amendment to the GST Act may be necessary to confirm that payment of the levy is consideration for a taxable supply, and therefore subject to GST.

Implementation Route Map and indicative timescales

There would essentially be 3 main stages to implementation:

- Scheme development through to Business Case approval.
- Stakeholder/public consultation through to approvals.
- Implementation through to operation.

Key tasks for each of these stages are summarised below (with indicative timescales highlighted):

Scheme development through to Business Case approval (12 months)

- Further support studies eg WTSM, financial and economic modelling all updated.
- Measures and monitoring existing situation eg on street parking audits and parking audits/management schemes developed where displaced parking predicted.
- Parking Levy scheme development eg tailored design, operational review, communications plan.
- Parking Levy legislation/regulatory scheme development and ongoing communications with Ministries.
- Identification of how Parking Levy revenue will be used to fund LGWM work packages.
- Project Management – eg risk management, governance stakeholder and communications management.

- Evaluation of impact of Parking Levy eg monitoring of parking market trends post introduction of the Parking Levy

Stakeholder/public consultation through to approvals (18 months)

- Consultation on Parking Levy Draft Act through to Ministerial approval.
- Public Consultation preparation eg materials and programme.
- Carry out public consultation eg events.
- Parking Levy approval eg business case, WCC approvals, LGWM Board approvals.
- Parking Levy scheme development eg detailed scheme design, specification and procurement.
- Ongoing project management.

Implementation through to operation (12 months)

- Parking Levy Draft Act Consented.
- Parking Levy implementation eg education and engagement, communications/marketing, IT front and back-office support, Parking Levy management and enforcement team recruitment and training, Parking Levy equipment and infrastructure, operational policies and procedures.
- Parking Levy scheme goes live – recommend no charge for first 6 months to allow licensing of all leviable spaces to take place.
- Parking Levy charging commences after 6 months (to provide enough time to allow WCC to work with off street car park owners/occupiers/operators to ensure they have obtained a Parking Levy licence and are licensed correctly) - eg compliance, enforcement, business support, ongoing communications – at this point Parking Levy costs would be funded by the Parking Levy revenue stream.
- Ongoing project management.
- Ongoing communications.
- Ongoing monitoring and evaluation.

The Parking Levy is likely to take 4 years to implement depending on the time taken for the Draft Parking Levy Bill and Wellington specific Order to be approved. This is ambitious but achievable. As such the earliest start year for the Parking Levy is 2025 and this is what has been assumed in the Financial Modelling. The interaction of these timelines with those for the LGWM programme will need to be explored in future studies.

1.0 INTRODUCTION

1.1 Background

One of the travel behaviour change initiatives proposed in the indicative LGWM programme is the use of a levy on commuter parking in Wellington CBD. The objectives of the Parking Levy (as stated in the parking Levy RFP) were to:

- Encourage mode shift (away from private vehicles).
- Provide a potential revenue source for funders.
- Improve network efficiency.

Candor3 have been appointed by LGWM to carry out the Wellington Commuter Parking Levy project. The Candor3 project team consists of:

- Candor3 - Lead consultant and Transport Planning.
- Nottingham City Council - Transport Planning with particular regard to the UK Parking Levy context.
- ptc - parking and traffic consultants with particular regard to the Australian Parking Levy context.
- Russell McVeagh – Public Law, Local Government and Tax inputs.
- Martin Jenkins – Financial Modelling inputs.
- RCG – economic appraisal inputs and property/development market inputs.
- WYG – additional international Parking Levy transport planning support.
- Curia – Market research.

The scope of the Parking Levy project is to research the potential effectiveness of a Parking Levy in Wellington CBD and, if the assessment suggests that it would be effective, then how it might be feasibly implemented to meet the objectives of LGWM. LGWM objectives are a transport system that:

- Enhances the liveability of the central city.
- Provides more efficient and reliable access to support growth.
- Reduces reliance on private vehicle travel.
- Improves safety for all users.
- Adaptable to disruption and future uncertainty.

There has been no formal decision to proceed with a Parking Levy and this study is for the purpose of informing possible options for the LGWM programme.

The Parking Levy interacts with the other elements of the LGWM programme and the findings from the Parking Levy Final Report have been incorporated into the Travel Behaviour Change (TBC) Single Stage Business Case (SSBC).

1.2 LGWM Programme Evaluation and the Contribution of the Parking Levy

As identified in the May 2019 LGWM Recommended Programme of Investment (RPI), the LGWM programme seeks to deliver a multi-modal transport system that moves more people, goods and services reliably, with fewer vehicles.

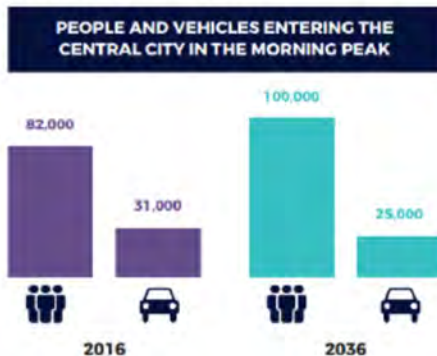
The LGWM Parking Levy stated objective of encouraging mode shift (away from private vehicles) will contribute to the LGWM Programme Objective of reduced reliance on private vehicles and the associated System Occupancy Key Performance Indicator (KPI). This KPI is shown in the LGWM images below and looks to achieve a mode shift from 38% of people driving to work in the inner city in 2016 to 25% by 2036 in the morning peak as shown in the figures below. This will result in a reduction in the number of private cars entering the city by 6,000, by moving people onto public transport and active modes and increased car occupancy due to pricing. It will achieve this by building more capacity or reallocating road space to these modes and the shift will be accelerated, supported and boosted by the Travel Behaviour Change (TBC) package including the Parking Levy.



SYSTEM OCCUPANCY

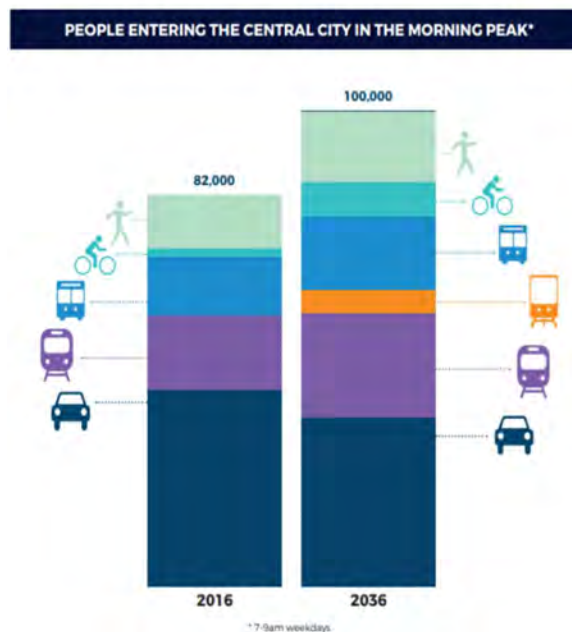
The ratio of people entering the central city (by all modes) against the number of vehicles entering the central city

System occupancy will increase due to more use of public transport, walking and cycling, fewer vehicles entering the central city, and increased car occupancy due to pricing.



REDUCING RELIANCE ON PRIVATE VEHICLES

18,000 more people are forecast to travel into the central city with 6,000 fewer cars.



1.3 Purpose of this Report

This report is the final deliverable of the Parking Levy project and presents the findings from the project. The report is structured as follows:

- Section 2 provides a summary of the projects previous deliverables, the Evidence Base Report and Survey Report.
- Section 3 presents a summary of a review of LGWM and partners key strategy documents, Parking Levy objectives and evaluation criteria.
- Section 4 summarises our economic framework assumptions and literature used.
- Section 5 presents our findings from the parking inventory.
- Section 6 provides a high-level description of the Wellington Commuter Parking Levy and options considered.

- Section 7 provides details and findings of the financial modelling work and detailed options assessment undertaken.
- Section 8 provides details and findings of the economic appraisal work and detailed options assessment undertaken.
- Section 9 provides details and findings of the implementation pathways and detailed options assessment for a Parking Levy.
- Section 10 outlines the next stages of the Parking Levy work.

2.0 SUMMARY OF PREVIOUS REPORTS

2.1 Introduction

Two reports have been prepared as part of the Parking Levy Project:

- Technical Note 1 – Evidence Base Review Report (attached as **Appendix 2.1**).
- Survey Report (attached as **Appendix 2.2**).

Draft findings from the Parking Levy work have also provided input to the draft Travel Behaviour Change (TBC) Single Stage Business Case (SSBC) prepared by WSP. This Final Parking Levy Report should be used in any updates of the Draft TBC SSBC.

Sections 2.2 to 2.4 below, provide a summary of the findings from the above reports.

2.2 Technical Note 1- Evidence Base Review Report

2.2.1 Purpose of the Evidence Base Report

The purpose of the Evidence Base Review report was to provide a critical review of the Parking Levy assumptions and impacts made by LGWM and its partners in developing the initial demand scenarios which underpins the other LGWM Packages. Specifically, the review:

- Identified any critical risks or failings in the assumptions underpinning the initial mode shift estimates.
- Commented on the significance of those failings with respect to the potential impact on the developing packages.
- Proposed remedial actions which can be implemented rapidly to minimise those risks/impacts.

2.2.2 Findings from LGWM modelling of a Congestion Charge.

The majority of the LGWM Programme Business Case work was undertaken assuming that pricing would take the form of a cordon charge for vehicles entering and exiting the area (CBD). An outcome-based approach was taken, whereby the aim was to reduce car trips to the CBD by 20% at peak times, with the cost of the cordon charge set to \$5 inbound in the AM peak; \$2.50 in the interpeak; \$5 outbound in the PM peak to achieve this outcome. It should be noted that these are in 2002 prices. Inflation since then means they would need to be increased by circa by 50% for comparison with today's prices (ie circa \$15/day – which is higher than the proposed Parking Levy).

2.2.3 Findings from LGWM modelling of a Parking Levy.

As part of the LGWM Indicative Package works, the cordon charge was amended to a Parking Levy fairly late in the development of the indicative package, hence there was limited time to implement anything very sophisticated in the modelling approach.

The Parking Levy modelling work was based on a levy of:

- Scenario 1 of between \$4 - \$6 per space/per day
- Scenario 2 of \$9 - \$14 per space/per day.

These prices are at 2002 levels and these would be the equivalent to circa \$6 - \$9 per space/per day (\$13.5 - \$21 per space/per day at current levels). These price increases (even at 2002 prices) compared to the existing international Parking Levy projects are much higher (circa \$2,250/\$3,500 p/a per space at 100% and assuming 250 working days/per year) and would give Wellington by far the highest levy charge in the world, even before it is inflated to today's prices.

Scenario 1 was found to reduce car trips to the CBD in the AM peak in 2036 by around 10% (relative to the Indicative Package (IP)) and Scenario 2 was found to reduce car trips to the CBD by around 20% (relative to the IP).

2.2.4 LGWM Model Specification Report

LGWM produced a Model Specification Report in August 2020 to support the LGWM work packages business cases. The Model Specification Report identified that *for the purpose of modelling a parking levy, desktop research was undertaken drawing upon available literature and applying this to a Wellington context. This evidence showed the following:*

- A 20% increase in the cost of parking could result in a 4% to 8% decrease in car trips to a CBD.
- Of those priced away from parking, around 30% to 50% could be expected to divert to PT, with the remainder either travelling earlier / later or parking on the CBD fringe.

The Model Specification Report also stated that in Wellington, around 50% of commuter parking is estimated to be in public buildings with 50% in private buildings (note as detailed in **Section 5** of this report it is more like 45/55 public/private split). Due to uncertainties regarding the extent to which parking buildings will absorb the cost of a levy (and make their base costs cheaper) and private business car parks might pass on the cost of a levy to users, the working assumption in the Model Specification Report is that a 20% Parking Levy (where the cost of commuter parking in the model is increased by 20%) would result in a 2% to 4% reduction in car trips to the CBD.

2.2.5 Recommendations for future WTSM modelling of a Parking Levy.

As detailed in Section 2 of the Evidence Base Report, the WTSM (Wellington Transport Strategic Model) used to model the impacts of the LGWM packages is a high-level regional transport model. The WTSM modelling work provides a guide as to how car drivers are likely to respond to a Parking Levy but the model does have limitations in testing specific policies, such as a Parking Levy and uses a single assumption about the level and impact of the levy across the Wellington region. Modelling a policy test, such as a Parking Levy, takes the model further away from the situation it was originally built for and the more likely the results are going to be unreliable.

In respect of the Parking Levy, suggested key areas for future upgrades of the model include (updated from the Evidence Base Report recommendations):

- The model does not account for distributional or equity impacts across different wards and demographic groups, for example. There is no income segmentation in the WTSM model, and as detailed in **Section 8** of this report, high income parkers will be less responsive to a Parking Levy than low-income parkers. It is likely that the costs of a Parking Levy or mode shift may fall on different demographic groups or wards within Wellington City. This is described in more detail in **Section 8** of this report (Economic Appraisal) and this data should be used to inform updates to WTSM.
- The model does not assess behaviours e.g. of users or of owners/operators of car parks. **Section 7** of this report (Financial Modelling) provides details of research undertaken on behaviour responses and this data should be used to inform updates to WTSM. The Stated Preference survey and external stakeholder consultation provides Wellington specific data that can be used to update WTSM.

- The use of the same price over all parking types – as detailed in **Section 5** of this report (Parking Inventory) actual prices faced by users vary and this data should be used in updates to WTSM.
- In the model the CBD is split into two spatial pricing areas – **section 7** of this report (Financial Model) provides details of the 2 CBD pricing areas and this should be reflected in updates to WTSM. In addition, the combined Northern suburbs Go Sector (Kapiti, Porirua, Johnsonville, Newlands) should be separated out to more accurately reflect their different characteristics.
- WTSM model should be updated to include Thorndon as part of the CBD - using the CBD study area definition shown in **Figure 6.1** of this report.
- WTSM doesn't model the parking supply and therefore doesn't allow for changes in parking supply if a Parking Levy is imposed. A Parking Levy may result in commuter parking being reallocated to other types of parking or other uses. **Section 7** of this report (Financial Modelling) provides details of the supply of commuter public and private parking spaces in the CBD and this should be used to inform updates to WTSM.
- On-street parking is not modelled. As detailed in **sections 6.13 and 6.14** it is recommended that on street coupon parking and 10-hour max meter parking within the CBD is managed as part of the Parking Levy and the WCC Parking Policy. Although it will not be subject to a Parking Levy the impact of the Parking Levy in terms of spill over/displaced parking is detailed in **Section 7** of this report (Financial Modelling) and this should be used to inform updates to WTSM.
- WTSM doesn't model working at home as a "travel" option – with the impact of COVID on working patterns then this is one area that WTSM should be updated, if only as a sensitivity test.
- There are areas (zones) in the WTSM model that have no parking charges where there is coupon parking; for example: Mt Cook, Oriental Bay and parts of Thorndon. There are other parts of Thorndon which are part of the \$4.50 per hour metered parking which are not subject to parking charges in WTSM. However, where people park may not be the same WTSM zone in which their journey terminates.
- Overseas models of parking choice found in the literature review have often used logit models (within existing transport models) which are a choice model commonly used in transport modelling. Bespoke models can also be built. It is understood that WAU developed a logit model for rail access choice based on modelled costs, and this could be an option for parking in the CBD using information available in **Section 7** of this report (Financial Modelling) with further information from the willingness to pay survey used in this report (eg information on trade-offs commuter car park users make between cost, type of parking/location and other modes).
- As detailed in this Report, the preferred Parking Levy option is now known and there is sufficient data to consider the scope for WAU to develop a bespoke Parking Levy model that is loosely coupled to the strategic model (which ideally could be used to address any other parking related issues for cost effectiveness). This could take the form of other models/spreadsheets that use model outputs (eg demand, distance, travel time, estimates of current parking costs) to develop a bespoke model to be 'loose coupled' to WTSM to model potential revenue/demand impacts of a Parking Levy. To do this this work would need to be integrated with work that Beca and Stantec have been commissioned to do to upgrade the WAU models.
- The scope to use the existing Aimsun model (which we understand has better representation of car parks in the CBD although it does not include private employer car parks) could also be investigated. We are also aware that the demands for this model come from WTSM and that there is no representation of parking capacity or charges in the model. The scope as to whether the Aimsun model could be used to give better refinement of Parking Levy transport modelling, for example to better understand trip start and end points given its far too coarse in WTSM to

effectively understand the impacts across some of the model zones within the leviable area, should be investigated.

2.2.6 Remainder of the Evidence Base Review Report

Although not a requirement, to set out context for the further ongoing work on the Parking Levy project Sections 3 to 10 of the Evidence Base Report also provided comments on:

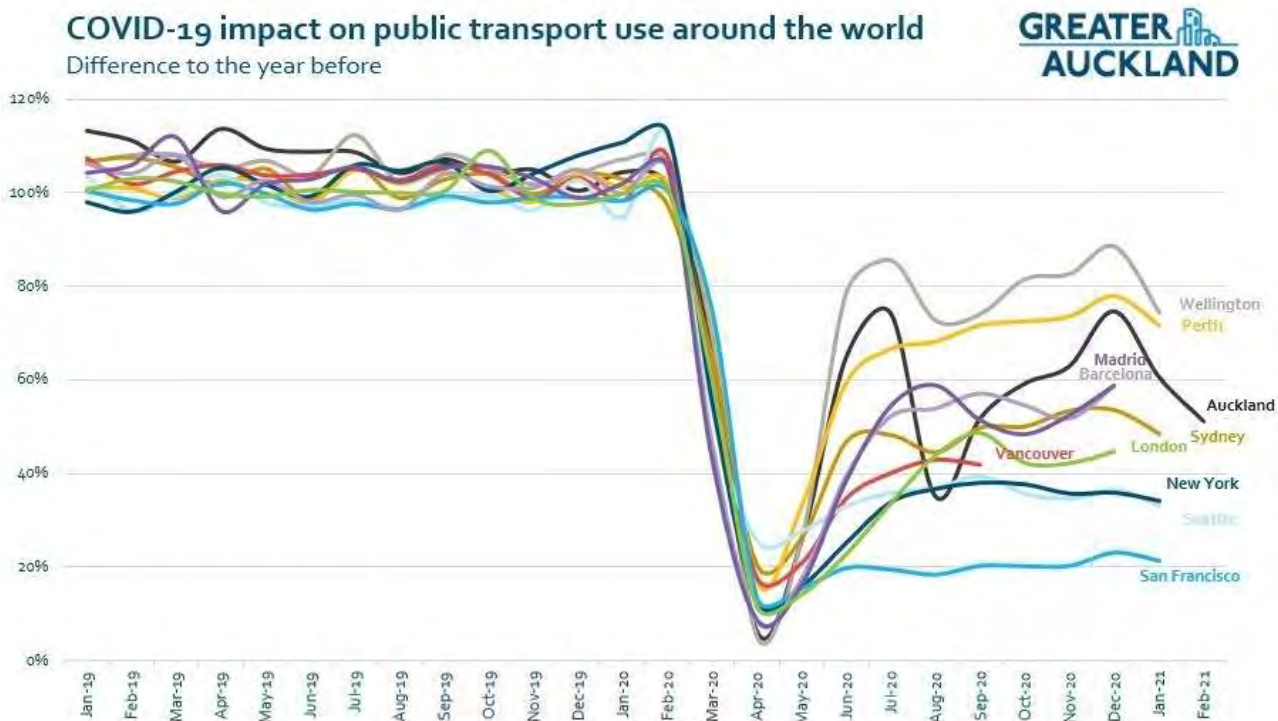
- Review of data on parking – this has now been updated as part of **Section 5** (Parking Inventory) of this report.
- Other sources of data eg Stats NZ and Census data, MoT Household Travel survey, property trends and changes to parking supply (eg due to earthquakes) – these data sources have been used throughout this Report most notably in **Sections 5, 6, 7 and 8**.
- Summarises work carried out on developing the Stated Preference Survey – the results are detailed in **section 2.3** below.
- High level review of International Parking Levy examples – these data sources have been used throughout this report, most notably in **Sections 5, 6, 7, 8 and 9**.
- High level Parking Levy legal review – this has now been updated as part of **Section 9** (Implementation Pathway) of this report.
- Initial comments on the economics/financial modelling – this has now been updated as part of **Sections 5, 7 and 8** (Parking Inventory, Financial modelling and economic appraisal) of this report.
- Details of other evidence base work recently received/reviewed – a review of key documents is provided in **section 3** of this report and the CBD definition is given in **Section 6** of this report. The other data sources listed in section 10 of the Evidence Base review Report have been used to inform **sections 5 to 9** of this report.

2.2.7 Impacts of COVID 19

The Evidence Base Review Report also provided commentary on possible impacts of changes in travel behaviours as a result of COVID-19. As reported in the Evidence Base Report, Wellington moved from Level 1 to Level 2 restrictions on 12th August. Wellington moved down to Level 1 at midnight 21st September. Restrictions during Level 2 included mandatory wearing of face masks on public transport as well as physical distancing.

The image below (source <https://www.greaterauckland.org.nz/2021/03/11/the-pt-slump/>) shows how Wellington and Auckland public transport usage numbers (and other international cities) compared to the same month for the 2 years before. Points to note include:

- Before Covid, most cities were tracking along fairly steadily and recording growth in PT use.
- With the exception of Barcelona being a month earlier, all cities were following the same pattern of starting to drop in March and then plummeting in April in which most cities dropped to between 5 and 20% of normal.
- Wellington recovered fairly well from the first lockdown, returning to 85% of normal public transport usage in June/ July 2020. Level 2 restrictions in August/ September 2020 and again in early 2021 do impact this recovery.
- Wellington, at the end of August was circa 85% of normal public transport usage but has fallen to circa 70% by January.



The last available NZTA Covid 19 Tracker report was dated 17/11/20. The last report specific to Wellington was dated 2/9/20 (based on fieldwork up to 30/8/20 when Wellington was still at Level 2) which indicated that public transport usage in Wellington experienced a statistically significant decrease in Level 2, whereas private vehicle use was found to have reduced by a small amount. Travel to work journeys in Wellington were similar as the Level 1 amounts but were still much lower than pre-April Covid lockdown levels.

We are also aware that Te Kawa Mataaho (Public Service Commission) guidance promotes flexible working (including working from home).

Covid and its medium to long term impact on travel behaviours (eg working from home and lower levels of public transport usage) remain uncertain. A key point to note in respect of the Parking Levy (and indeed for other LGWM Packages) is whether there are any long-term structural changes from Covid (eg working from home) that actually achieve greater reductions in vehicles entering the CBD in the AM peak. This is outside the scope of the Parking Levy study, but it is recommended that LGWM monitor this and adapt their strategic models accordingly. The impacts of Covid will need to be assessed against the growth projections for the region and CBD trips.

LGWM have indicated that Covid impacts will be assessed on a programme basis and not each work package separately. It is understood that the WAU are looking at sensitivity tests on Covid impacts and it would be useful to incorporate the findings from these tests into the Parking Levy project to ensure robustness of the results.

Irrespective of the impact of Covid on travel behaviour, parking levies in the Australian cities were still payable on leviable spaces, although payment was deferred in some States and in Sydney for example, the quantum of the levy revenue will be impacted by the expected increase in unlicensed spaces in private car parks and the unused casual bay exemption.

It will be important to continue to monitor working from home following Covid as this will positively contribute to the modal shift target if working from home remains a permanent option after Covid. Even a

pro-rata shift per week of commuters will all positively impact on the objective with no real investment from the Parking Levy required. It could even be worth considering using some of the Parking Levy revenue to fund business support to actively encourage employers to invest in working from home as this is a new option that could see a major shift in travel behaviour including impacting on CBD's in terms of future office space demand and usage. We are aware internationally that large employers are looking at the business case and opportunity from Covid to switch to long-term working from home as a viable strategy to minimise office space and costs and also greater access to a wider workforce recruitment/retention if staff don't need to commute daily to a centralised office.

In considering the impacts of Covid it is important to note that Covid could be seen as a potential short-term impact, whilst reducing the number of car commuters parking in the CBD should be considered as a long-term impact. The mode change generated by the Parking Levy as part of the broader programme will also help cater for regional growth. As such it is important not to lose sight of the bigger picture.

2.3 Survey Report

2.3.1 Purpose of the report

This report presented the findings from the survey work carried out in the first 3 weeks of November 2020, for the project which consisted of:

- Phone Poll Stated Preference Survey of drivers who park in the CBD in the morning peak period.
- Equivalent survey in an online form using GWRC Greater Say panel.
- Equivalent survey in an online form using WCC Capital Views panel.
- Meetings with external stakeholders.

2.3.2 Phone Poll Survey Results

The key findings were:

Days Commuting

- 41% of commuters commute in every day. 54% commute in at least four days a week and 74% at least three days a week. This is expected to be lower than pre Covid levels and reflects the response below of 42% working from home when they were not commuting.
- Male commuters are more likely to commute every day.
- Commuters from Kapiti and Wairarapa are far less likely to commute in every day.
- Commuters from wealthier households are more likely to commute in every day.

Non-commuting days

- On non-commuting days, 42% say they are working or studying from home (see comment above that this is likely to be higher than pre covid levels), 23% are using public transport (this is an encouraging amount using public transport and indicates the scope for modal shift with a Parking Levy) and 19% not working or studying that day.
- Women more likely to be working/studying from home or not working/studying that day.
- Lower income households less likely to be using public transport.
- Higher income households more likely to cycle or walk.

Arrival time in CBD

- The mode is 0800 to 0829 at 22%.
- 27% normally arrive before 0800, 39% between 0800-0900, 13% 0900 to 0930, 5% 0930 to 1000 and 4% after 1000. Therefore, the vast majority of commuters are arriving before 1000.
- Male commuters are more likely to arrive before 0730. Female commuters more likely after 0830.
- Commuters who live in Wellington City are less likely to arrive before 0730.

Company vehicles

- 10% of commuters drive to work in a company vehicle – this confirms the Census figure of 11%. Compared to Auckland, there is a lower amount of company cars which probably reflects the greater amount of Government/public sector employment in Wellington.
- Company vehicle drivers are much more likely to be male (14%) than female (5%).
- Fewer company vehicles driven in by Wellington City residents.
- Few company vehicles driven in by lower income households.

Main reason for driving to CBD.

- Almost half (47%) said convenience, followed by 15% who cited children drop off or pick up (this is a lower amount than what the Parking Levy team had been told anecdotally) and 13% who said they need their car for business during the day (this indicates that complementary measures should be provided with a Parking Levy for example in the form of Workplace Travel Plans which could consider provision of pool cars, pool ebikes and public transport prepaid access cards).
- Only 3% said they drove in mainly because there were no other options such as public transport. This is a very encouraging statistic since drivers are, on the whole, aware of public transport alternatives and only a very small number of drivers do not have a public transport option available.
- Female commuters are more likely to also be dropping off or picking up children.
- Male commuters are more likely to also be using the car for business.
- Those in 30s and 40s most likely to cite children drop off as main reason.

Normal parking location in CBD

- 32% said they park in off street public car parks, 29% on street, 19% in employer car parks and 9% in private parks. The 29% seems high and may reflect respondents incorrectly assuming at grade off street car parks as on street. Likewise, the 9% in private car parks seems high and may reflect respondents incorrectly assuming that monthly passes are private.
- Men more likely to park on street and women more likely off street.
- Parking on street is correlated to income, with 49% of bottom quartile households parking on street and only 19% of top quartile households.

On street parking

- Of those who park on street, 62% pay for a space, 19% use coupon parking and 11% park in free spaces.
- Men are more likely to use coupon parking.
- 25% of low-income households use free on street parking compared to 7% of high-income households.

Off street public parking

- 39% of off-street public parkers pay an early bird fee.
- 29% pay daily and 22% pay monthly.
- 10% have an employer pay.
- Women more likely to pay an early bird fee.
- Men more likely to pay monthly.
- 12% of men and 7% of women have employer pay.
- Lower income households more likely to pay an early bird fee.

Employer parking

- 60% of commuters who park at their employer's business have the park provided for free.
- 20% have the cost as part of their salary package and 12% get charged by the employer.
- Low-income households less likely to have their employer pay.

Cost of Parking.

- The mean daily cost for off street parking in the CBD is \$17.01.
- The median daily cost is \$15.60, and half the parkers pay between \$12.50 and \$20.00 a day.
- The mean cost for low-income households is \$9.91.

Parking App

- 27% pay using a parking app.

- Younger drivers are more likely to use a parking app.
- Low-income households less likely to use a parking app.

Impact of parking cost increases - this information has been used within the financial modelling.

- In response to a \$5 increase in the cost of parking, around three quarters of respondents would not take steps which would reduce congestion and one quarter would.
- In response to a \$10 increase in the cost of parking, around two thirds of respondents would not take steps which would reduce congestion and one third would.
- At \$5, 54% say they would not change and at \$10, 40% say they would not change.
- At \$5, 23% say they would still drive in and park cheaper, and at \$10, 27% say the same.
- At \$5, 16% would use public transport and at \$10, 20% would.
- At \$5, 6% would work/study from home more and at \$10, 8% would.
- Male commuters more likely to say no change if cost increases.
- 29% of low-income households say no change if cost increases by \$5 and 59% of high-income households.
- 18% of low-income households say no change if cost increases by \$10 and 44% of high-income households.
- Those who commute in five days a week are more likely to say no change.

2.3.3 GWRC Online Survey Results

Although a very small sample, sampling error calculations were not carried out and the results are un-weighted, overall, the GWRC survey results indicated broad agreement with the Phone Poll survey findings.

2.3.4 WCC Online Survey Results

Although a smaller sample, sampling error calculations were not carried out and the results are un-weighted, overall, the WCC survey results indicated broad agreement with the Phone Poll survey findings.

2.3.5 External Stakeholder Consultation

Meetings were held with a selection of external stakeholders consisting of:

- Public Car Park Operators
- Property Owners
- Property Managers
- Business organisations

2.3.6 Summary of key issues raised.

The key issues raised included:

General

- Overall concern of impact of Levy on the CBD economy.
- Levy would unfairly tax those who don't have an option but to drive eg have work and childcare requirements – however the survey results do not show this to be a high percentage.
- Tradies included in Levy? – most park on a construction site for free. In the Parking Levy proposal Tradies are considered to be regular business visitors.
- Will WCC take the Levy into account when determining rates? – need to look at totality that businesses have to pay and not in isolation.

Private car parks

- How to address fleet/operational vehicles? In the Parking Levy proposal these are exempt.

- Vast majority of car parks are part of an overall tenancy agreement but there are some car park spaces that are leased directly.
- Majority of leases in Wellington are Gross ie rates and insurance are borne by the property owner and are not part of tenant's leases. If Levy introduced and property owners are responsible to pay, then the levy will not be passed onto the occupier and hence ultimately not to the driver and therefore no mode shift. In the Parking Levy proposal the occupier is responsible for paying the Levy.
- If the occupier is responsible for paying the Levy and they renegotiate with the owner to have a smaller number of car park spaces, then this will impact on the value of the building. Stakeholders queried whether there was scope though to lease these spaces to a commercial car park operator?
- Government typically has low amounts of parking provision.
- Has been a decline in parking requested by tenants over the years.
- Most owners/managers unaware if occupiers charge their staff for parking - one example though given of occupiers auctioning off parking spaces to their staff. The survey results indicate only 12% of workers are charged for their parking space.
- Examples given of some parking spaces being converted to bike parking.
- Car park leases are circa \$45-\$65/week in Newtown and \$95-\$175 in CBD – average in CBD is \$110-\$120 (note excludes any Body Corp charges – typically \$30/week).
- Scope for reuse of basement car park areas is limited - bike parking, changing areas, gyms?
- If occupiers are responsible for paying the Levy, then what does the employer do where the employment agreement includes a parking space?
- Average lease life is 6 to 10 years. Government agency leases are typically for 15 years.
- Lease charges to occupiers are at the limit.
- Tenants are now looking to move out of the CBD and looking at Johnsonville and Petone – the Levy will exacerbate this trend.

Public car parks

Impact of Covid

- Varies by operator with some car park operators indicating that they are at 90% and 75% occupancy of pre covid levels, some have said occupancies have dropped and this varies by location, with 1 operator indicating no decline in usage post Covid. Overall this does confirm that commuter parking is lower post Covid.

General

- All operators confirmed they would pass on the Levy to drivers.
- Some operators are moving towards providing more short stay parking.
- Some operators are converting spaces to bike parking.
- One operator is introducing subscription parking for 2 to 3 days a week parking.

CBD Residents - would Levy apply to residents who park their car during the weekday?

- Some operators have CBD residents leasing spaces and one has very few of its leases with CBD residents.

Car park data

- Very limited data was provided by car park operators.

2.4 Draft Travel Behaviour Change SSBC

2.4.1 The draft SSBC calculated the following draft benefit cost ratio for the Parking Levy:

	Parking Levy
Cost (\$M) (2022-2031)	\$9.0
Revenue (\$M)	\$117.4
Benefit (\$M)	\$28.3
BCR (excluding Revenue)	3.1
BCR (including Revenue)	16.2

The draft SSBC indicated that the main benefit from the levy is the net revenue raised, estimated at \$27 million per year (for the year 2030). Commuters who take the opportunity to offset their costs by changing mode will have additional benefits from a Parking Levy due to the travel behaviour change. These are congestion reductions for other road users, GHG emissions, and accidents/ injuries/ deaths etc. **Section 8** provides an update to the TBC SSBC BCR calculations

3.0 REVIEW OF LGWM AND PARTNERS KEY STRATEGY DOCUMENTS, PARKING LEVY OBJECTIVES AND EVALUATION CRITERIA

3.1 Documents Reviewed.

The following documents were reviewed and the key findings are summarised below (full details of the review provided in **Appendix 3.1**).

Relevant National Transport Strategy Documents include:

Government Policy Statement (GPS) on Land Transport 2021 (final version released September 2020) - sets out the government’s priorities for expenditure from the National Land Transport Fund over the next 10 years. The GPS 2021 prioritises safety, better transport options, improving freight connections, and climate change.

Arataki is Waka Kotahi’s 10- year view of what is needed to deliver on the government’s current priorities and long-term outcomes for the land transport system. This identifies a number of inter-related step changes, including Urban Mobility. This highlights the urgent need to shift from reliance on single occupancy vehicles to more sustainable transport solutions for the movement of people and freight.

Keeping Cities Moving is Waka Kotahi’s overall national mode shift plan. It details a series of actions for Waka Kotahi to pursue and outlines a best practice approach based around the integrated use of three key levers of which the influencing travel demand and transport choices indicates *this may include parking policies, road pricing*.

Relevant Regional Strategy Documents include:

Let’s Get Wellington Moving (LGWM) - Let’s Get Wellington Moving (LGWM) is a joint initiative between Greater Wellington Regional Council, Wellington City Council, and the NZ Transport Agency to address transport and urban development issues to and through central Wellington city. A key objective of the LGWM programme is to reduce traffic in central Wellington city. The Parking Levy stated objective of encouraging mode shift (away from private vehicles) will contribute to the LGWM Programme Objective of reduced reliance on private vehicles.

Regional Land Transport Plan 2021 is currently in development, with consultation concluded, and the draft strategic front end has a high focus on mode shift, including:

- Vision: a connected region, with safe, accessible and liveable places – where people can easily, safely and sustainably access the things that matter to them – and where goods are moved efficiently, sustainably and reliably.
- Headline target: 30% reduction in transport generated carbon emissions by 2030; 40% increase in active travel and public transport mode share by 2030.

- Strategic objectives including:
 - People in the Wellington region have access to good, affordable travel choices.
 - Transport and land use are integrated to support compact urban form, liveable places and a strong regional economy.
 - The impact of transport and travel on the environment is minimised.
- 10-year transport investment priorities including:
 - Build capacity and reliability into Wellington Region’s rail network and into the Wellington City public transport including with additional mass rapid transit network within Wellington City to accommodate future demand.
 - Make walking, cycling and public transport a safe, sustainable and attractive option for more trips throughout the region.

Wellington Regional Growth Framework – this is a spatial plan (Options Report currently being developed) that will describe a long-term vision for how the region will grow, change and respond to key urban development challenges and opportunities.

Wellington Regional Mode Shift Plan - The Wellington Regional Mode Shift Plan sets out how the region can increase the share of travel by public transport, walking and cycling. Under the influencing travel demand lever, *“Progress the LGWM Travel Behaviour Change and Parking Levy investigations,”* is stated as one of the focus areas. The Mode Shift Plan notes that *“if well designed, a parking levy can target commuters and encourage use of active modes or public transport. The inclusion of some exemptions and concessions, like in Melbourne, such as for residential and disabled parking, and spaces provided free of charge for visitors and patients, would give more equity”*.

Smarter Connections - A strategy for park and ride in the Wellington region (November 2018) - In the context of the Parking Levy this strategy offers an alternative to CBD commuter parking.

Wellington CBD Cordon Survey 2001-2019 (GWRC 2019) - This report indicated that between 2000-2019 changes in terms of modes used to cross the selected points around the CBD were:

- Active modes = increase of 31.7%.
- Public transport passengers = increase of 44.4.%.
- People in private motor vehicles = reduction of 17% (vehicles decreased by 13.2%).

Relevant WCC Strategy Documents include:

WCC District Plan – with the National Policy Statement on Urban Development 2020 (NPS-UD then future new development in the city, including outside of the central city, there will be no minimum off-street parking requirement, except for accessible car parks.



Wellington City Council Parking Policy 2020 - Adopted August 2020 (plus accompanying supporting documents including):

- Parking Policy 2020 Statement of Proposal (March 2020).
- Parking Policy Review – Background and Information and Issues report (Jan 2020).
- Smarter Ways to Manage City Parking (Nov 2019).
- Wellington City Council Parking Survey (Nov 2019).

The final parking policy was adopted by the full Council on 26 August 2020. The parking policy sets the objectives and principles for the management of Council controlled on-street and off- street parking, and how parking supports achieving the vision for Wellington. It covers Council-controlled off-street parking, mobility parking, car share parking, loading zones, taxi stands, short-stay parking, parking for residents, buses and coaches, motorcycles, electric vehicle charging and on-street parking for bicycles and micro-mobility (eg e-scooters).

The WCC parking policy indicates that there are circa 28,800 car parks. This includes residential and retail parking which when removed for comparison with the Parking levy study gives:

- 13,500 private car parks.
- 11,200 public car parks (private operators).
- 830 public car parks (WCC operated).
- 3,270 on street metered car parks.

Section 5 of this Report provides an update to these figures which have been used in this report (based on more up to date data) and a summary is shown in **Table 3.1** below:

Table 3.1 – Comparison of WCC Parking Policy and Parking Levy derived off street CBD car park totals.

	WCC Parking Policy	2020 (Parking Levy)
Off street Public car parks (WCC and private operators)	12,030	10,094
Off street Private car parks	13,500	11,956
Total off street private and public car parks	25,530	22,050

WCC have also indicated that there are 3,656 coupon spaces predominantly outside of the CBD (at Clifton, Kelburn, Mount Cook, Mount Victoria, Te Aro and Thorndon). As detailed in **Section 6.14**, circa 761 of these coupon spaces are actually within the CBD.

The Parking Policy notes that challenges include *“conflicting public views. There is wide public support for a more pedestrian and bike-friendly city, at the same time wanting more and cheaper parking. While some people feel that parking is over-priced, others believe pricing is not high enough. Residents’ survey results show dissatisfaction with parking availability, and feedback on the Let’s Get Wellington Moving work programme shows a split in opinion between those who want more and cheaper parking versus those who support less parking and using more active and public transport. There have been long periods of time between changes to parking fees and it is not clear how those fees have been calculated or what the outcome is from the price change. This has contributed to the “politicising” of parking pricing, the willingness to pay more for parking, and the disconnect between people’s expectation of the price of parking versus the reality”*.

The policy recognises that the Council is not the only provider of parking and that when the Council makes parking management decisions, it will need to consider private parking supply, how it is managed and the Council's role to address the gaps in the overall parking market. Active modes of transport, such as walking and cycling, and public transport have the highest priority. This means that when users are making decisions on using road space, they take a higher priority to parking. This is reflected in the parking priorities set out in the parking policy. The Parking Levy is complementary to many of the objectives and measures within the Council's Parking Policy and is a key measure to support the Parking Policy, including how parking is prioritised and managed both in the CBD and the CBD fringe/residential streets (for example in terms of how any overspill/displaced parking from the Parking Levy is managed).

Draft Mobility Parking Guidelines and Mobility Parking Spaces (2019) - Outlines guidelines required to support the management and use of Council mobility parking spaces.

Wellington Urban Growth Plan 2014-2043 (June 2015) - The plan is the Council's guide for directing investment and supporting development in growth areas. Although not specifically referencing the Parking Levy, the Urban Growth plan indicates an action to *“Discourage the provision of commuter parking particularly in the central city – short-stay parking has greater economic benefit than long-stay as it supports retail and business activity. We will encourage the conversion of long-term parking into affordable short-stay parking or other uses”*.

Te Atakura, First to Zero, Blueprint - this has several mentions of parking and user charges including:

- *“Parking pricing adjustments – One of the key services councils provides to the community is parking throughout the city. Whether for residential, coupon or short stay parking, we will explore a long-term plan for tolling higher emissions vehicles via parking charges towards the end of the transition. This may require the assistance of Central Government.*

- Sending signals about road use – To limit congestion and signal the true cost of driving there is one powerful tool to put in place – user charges. This would help optimise road use between modes, and charges would help a city with no more room to build road capacity manage demand.
- Nearly 60% of our carbon emissions come from Transport, so changing the way we move around the city is critical. We're exploring opportunities in infrastructure investment through the Let's Get Wellington Moving project as well as a range of other initiatives. Key to success is expanding shared mobility options like carshare and bikeshare, some form of user charges to reflect the true cost of driving, electric vehicle charging stations, supporting the growth of active and public transport, and more".

Our City Tomorrow - In 2017 WCC carried out a series of stakeholder workshops, public surveys and engagement events to raise awareness of the long-term challenges Wellington is facing and start a conversation about what the city should be like in the future. From this feedback five key goals emerged- that Wellington City should be: compact, inclusive & connected, greener, resilient, and vibrant & prosperous. These goals have helped inform WCC decision-making, starting with the 10-year plan (see below).

Long Term Plan 2018-2028 (June 2018) outlined a number of priorities of which Transport is one. Within the plan there is a performance measure of <85% car park occupancy (subsequently revised to 50%-70% target in the **WCC Annual Plan 2019/20** which is based on updated current results from the WCC parking sensors) and outcome indicators of decreasing numbers of commute trips by car.

Previous New Zealand Demand Management Studies include:

Parking Restraint Measures and their Implementation – Transfund New Zealand Research Report No 145 (1999). The objective of this project was to provide guidance on the development, specification and implementation of parking restraint policies for the major urban centres in New Zealand. The report concluded that imposing a Parking Levy on publicly available CBD parking is likely to be the most cost-effective parking restraint measure. Implementing charges on private parking for private use would have the greatest impact on CBD traffic levels but would be more difficult to implement and may require enabling legislation. The report indicated the following number of spaces in Wellington CBD (based on 1996 survey):

On street:

- 4032 = metered/coupon.
- 483 = sign restricted.
- 488 = residents parking.
- 527 = uncontrolled.

Off street public (Council operated):

- 2123

Off street public (private operator):

- 9022

Off street private:

- 1525 = customers
- 12,745 = staff
- 480 = other

Therefore, in 1996 there were a total of 11,145 off street public car parks and 12,745 private (employer car parks). **Section 5** of this Report provides an update to these figures and a summary is shown in **Table 3.2** below:

Table 3.2 – Comparison of 1996 and Parking Levy derived off street CBD car park totals.

	1996	2020 (Parking Levy)
Off street Public car parks (WCC and private operators)	11,145	10,094
Off street Private car parks	12,745	11,956
Total off street private and public car parks	23,890	22,050

The report indicates that the Coupon parking scheme was implemented in December 1994 (a legal challenge delayed the start by one year) and there was total of 5,500 Coupon spaces. The charge was initially \$2 with monthly and annual discounts. The Coupon area covered the fringes of the CBD and included several resident parking zones. Assessment of the scheme in 1995 found that the number of commuter vehicles reduced by 25% and there was no displacement to adjacent non-Coupon areas. Bus ridership increased by 2%.

Wellington Region Road Pricing Study Stage 2 (February 2007) - GWRC carried out a study on road pricing in the Greater Wellington region with the primary objective of improving network efficiency and the secondary objective of raising revenue. Parking charges was ruled out of this study on the basis that parking charges were not considered to be targeted at congestion bottlenecks and have little effect on congestion (the primary objective of the road pricing study).

Wellington Public Transport Spine (PTS) Project – Alternative Funding Options Study (August 2013) - The purpose of this report was to examine the potential of alternative funding tools to fund, or part fund the PTS options. One of the options evaluated was a CBD based Parking Levy and the report concluded that a Parking Levy could be one of the options to fund the PTS options.

Tackling Congestion in Auckland – Auckland Road Pricing Evaluation Study (ARPES) March 2006.

MoT studied demand management in Auckland with the focus on Road Pricing. As part of this study an option of a Parking Levy was considered. This would charge for parking on both public and private property (e.g. parking buildings or businesses) within the Auckland/Newmarket, Manukau, Henderson and Takapuna CBD's. The charges modelled were \$10 per day, in addition to any parking charges already in place. The study concluded that the Parking Levy scheme would be cheaper to implement than the road pricing schemes. The report indicated that it is a reasonably straight forward model as unlike the other schemes it would rely less on technology. It also noted that it has considerable revenue potential, but this is, in part, because the charges were set considerably higher than the charges for the other schemes. The much higher charges relative to the other schemes would be necessary to generate a meaningful impact on congestion. To achieve this impact, it would also be necessary to charge private spaces as well as street parking and public parking buildings. Therefore, legislation would be required providing parking officers access to private property. The Parking Levy scheme, while successful at raising revenue, was found to be much less successful at reducing congestion than the road pricing schemes because parking charges would not capture through traffic and the parking zones are small, focusing on CBD's as recognised concentrated areas of parking.

Further work in 2008 went into more detail on two of the options, with a Parking Levy not one of them; however, a levy was briefly discussed as a "low-cost alternative revenue scheme". The study noted that "the parking scheme would use coupons, with provision for private operators to opt out of this scheme in favour of a higher flat rate fee per space available". Setup costs were estimated at \$250,000, with annual

costs of \$530,000. With 38,045 parks charged, the study estimated revenue of \$28.5m, i.e. \$750 per space per year. The study also looked at scaling this up by almost three times.

Recent Government announcements on Congestion Charging

Prior to the General Election in October 2020, the Prime Minister ruled out any new Regional Fuel Taxes and, during, January 2021 the Minister of Transport confirmed that the Government was only considering Congestion Charging in Auckland (where this is part of *The Congestion Question Project*).

The Sustainable Business Council and Climate Leaders Coalition

This coalition represents circa 150 businesses (including Fonterra, Silver Fern Farms, Stuff and Z Energy) representing about one-third of the country's GDP. After the General Election the Coalition compiled a list of actions its members think the Government should implement or begin this term. One of these actions was to develop a range of policies to cut road pollution including the proposed Clean Car Standard, the Clean Car Discount or “feebate” and the removal of fringe benefit tax on plug-in electric cars, to make them more attractive for corporate fleets. The group also indicated that road congestion charges, **higher parking rates** and putting \$10 million into subsidies for e-bikes would reduce the number of cars on the roads.

Relevant GWRC Modelling Reports include:

As outlined in Section 2, the Parking Levy project has reviewed and made reference to various GWRC modelling reports. Based on this and on discussions with the WAU a number of recommendations for improvements to the WTSM model have been made in **Section 2**.

Relevant WCC Car Park Survey Reports include:

WCC made available various car park survey reports including:

- Parking Occupation and Duration Surveys (June 2019).
- Newtown Connections Parking Survey (August 2019).
- Town Belt Parking Survey – Newtown and Island Bay (September 2019).

These surveys are useful to understand the existing on street parking situation on the CBD fringe for residential permits, coupon parking, metered 9 hour/10-hour parking, free time restricted parking (eg at Clearways) and free unrestricted parking. There is also free unrestricted parking used at Reserve Management car park locations and adjacent on street locations.

Based on these surveys it can be concluded that there is little capacity to accommodate any additional parking in the Coupon areas at Mt Victoria, Thorndon and Te Aro.

The Town Belt survey report assessed the use of inappropriate use of Reserve Management car park sites (and adjacent on street areas) by residents and commuters in Newtown and Island Bay (Rugby park at Hanson Street, Alexandra Road including Wellington Croquet Club and Wellington Harrier Club, Wellington zoo, Russell and Edinburgh Terrace and Wakefield Park and Berhampore golf course). The survey indicated that residents and commuters are displacing users at Hanson Street and Alexandra Road.

The Newtown Connections Report surveyed parking in the Newtown and Berhampore areas (of which 83% is unrestricted) – this report indicated a number of locations of high occupancy and long length of stay at weekdays indicating use by commuters.

Relevant Wellington/New Zealand Car Park User Questionnaires include:

Wellington City Council Parking Survey (Nov 2019) - Key findings included that “*at least half of those who drove to Wellington’s central city for work... had a total household income of more than \$100,000*”

and “those with a high income (100k and over) are significantly more likely to drive than they are to use another mode of travel”. It should be noted that revenue from a Parking Levy would help fund the LGWM package of improvements that would directly benefit the low-income groups which is a strong equity argument for a business case.

Wellington Survey by Colmar Brunton (2014) - Key relevant points to note from this survey are:

- 1) Almost all early bird parkers pay for their own park.
- 2) For monthly parkers there could be a more even split between paying for their own park vs employer pays, but the survey used ambiguous language. We addressed this issue as part of our survey.
- 3) Indicatively, around 2/3rds of commuters might pay for their own park. The share is probably lower for private carparks i.e. those in office or government buildings.
- 4) Most monthly parkers use the carpark every weekday. This is also true for earlybirds, but some might drive on fewer days or use other carparks – the survey only asked how many days they used this particular carpark.
- 5) A number of drivers would consider switching modes if parking is less convenient, or more expensive.

O'Fallon, Sullivan and Hensher (2004) - Key relevant points to note from this research mainly relate to the impact of the parking surcharge or cordon charge. A charge of \$5 would get 8%-12% of drivers to change mode, whereas a charge of \$10 would get 16%-18% to change mode. These results are indicative but illustrate that a reasonably large charge is needed to change behaviour: \$10 was a larger amount of money in 1999. The Consumer Price Index has increased by 54% since then, and median household incomes have doubled.

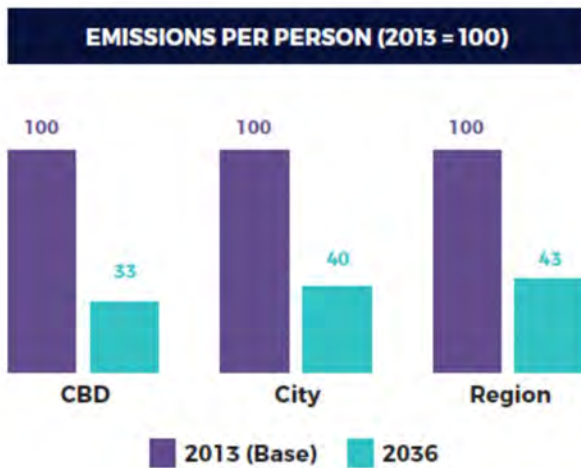
3.2 Parking Levy Objectives

Following the review of the relevant LGWM partners and other stakeholder policies and strategies (and also based on our own evidence base review work) the key issues and problems that the Parking Levy will contribute to addressing have helped to define the following objectives of the Parking Levy:

- Encourage mode shift (away from private vehicles) – this will contribute to the LGWM Programme Objective of reduced reliance on private vehicles. Within this objective there is the associated System Occupancy Key Performance Indicator (KPI). This KPI looks to achieve a mode shift from 38% of people driving to work in the inner city in 2016 to 25% by 2036 in the morning peak. This will result in a reduction in the number of private cars entering the city by 6,000, by moving people onto public transport and active modes and increased car occupancy due to pricing.
- Provide a potential revenue source for funders – as well as providing a funding mechanism for the LGWM programme of works, hypothecation (ring fencing) of the revenue raised for transport improvements is a key consideration.
- Improve network efficiency - this will contribute to the LGWM Programme Objective of provide more efficient and reliable access to support growth by reducing congestion and improving accessibility.

The above 3 objectives were defined in the Parking Levy RFP document - following the review of the relevant LGWM partners and other stakeholder policies and strategies it is considered that the Parking Levy also has the following additional objectives:

- Equity which includes vertical equity (eg impact on different socio-economic groups, with different levels of ability to pay) and horizontal equity (eg are the people paying for the policy the same people benefiting from it or mitigate costs?). This will contribute to the LGWM Programme Objective of Liveability. Equity was also a key requirement to address within the RFP.
- Reduce carbon emissions - The Parking Levy will also contribute to the LGWM Liveability Programme Objective and the Carbon Emissions KPI of reducing emissions per person in the CBD from a base of 100 in 2013 to 33 in 2036 (as shown in the LGWM image below).



The Parking Levy RFP document indicated that emissions are projected to decline due to changes in the vehicle fleet (fuel efficiency and electric vehicles) and the LGWM programme contributes a further 18% reduction in emissions within the CBD with road pricing having the biggest impact on emissions. Although unlikely to be as effective as road pricing in reducing emissions within the CBD, the Parking Levy can be expected to contribute to a reduction in emissions. This also will contribute to the Regional Land Transport Plan 2021 Headline target of a 30% reduction in transport generated carbon emissions by 2030 and the WCC Te Atakura, First to Zero, Blueprint.



3.3 Integration of the Parking Levy with LGWM Programme and WCC Parking Policy and District Plan

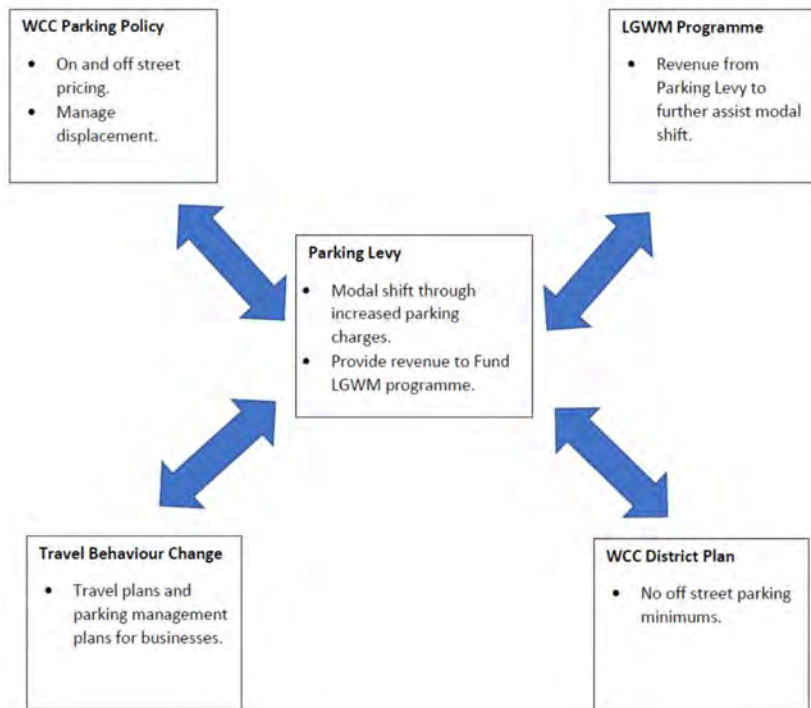
Integration of the Parking Levy with the WCC Parking Policy and District Plan is considered essential since the Parking Levy needs to be supported with a strong complementary parking policy, reduced or reallocated on street parking and improvements in public transport, active travel and travel behaviour change (eg workplace Travel Plans and Parking Management plans). The new parking policy must actively manage the on-street parking supply to ensure that the Parking Levy and parking policy are consistently working towards reducing commuter parking trips into the CBD especially in the AM peak.

The Parking Policy should ensure that parking prices both on/off street manage car commuting effectively through market rate pricing and prioritising short stay customers over long stay commuters. Reducing the supply by converting it to other uses such as active travel cycle lanes will also contribute to the Parking Levy objective and reduce supply. It is noted that there are limitations for WCC to raise pricing of for example infringement fees (Fees and Penalties Regulation) which causes issues where the current enforcement fees are not high enough to disincentivise behaviour (with the penalties barely higher than the actual cost to park) and Residents Permits (Land Transport Act). The Parking levy will need to integrate with the Parking Policy to ensure the on and off-street parking systems work together.

The Parking Levy and the LGWM package of improvements along with the supporting parking policy will help manage supply and demand, increase parking prices especially for car commuting, reduce the amount of places available for long stay, and provide major investment in sustainable alternatives to the car which will all contribute to the objective of achieving 20% modal shift in the AM peak. The positive combination of the new policies together will need to be considered as they will directly address car commuting effectively as part of the following jigsaw solution (see **Figure 3.1** below):

- Parking Levy – increase cost of parking provision, reduce or encourage change of use and increase car commuting parking costs when passed on.
- Parking Policy- manages different parking provision supply for customer groups (retail, resident, leisure, visitor, commuter etc). The Parking Policy shifts towards demand responsive pricing for on-street where high demand = high price and low demand = lower price. This is intended to maximise occupancy and create appropriate turnover rates depending on the park location. This also supports the user pays principle. The CBD metered spaces would become demand responsive and incremental, therefore, someone could stay all day, if they paid (a premium) for all day parking.
- LGWM Programme – Parking Levy revenue delivers a range of high-quality public transport and active travel improvements to provide increased capacity and levels of service and encourage car commuters to switch modes.
- Travel behaviour change including support for businesses and employees (eg workplace Travel Plans and Parking Management plans).
- For future new development in the city, there will be no minimum off-street parking requirement (except for accessible car parks) and the introduction of a Parking Levy could encourage commercial developments to provide limited employee/long stay parking spaces.

Figure 3.1 Parking levy and integration with LGWM program and WCC policies



There are several key aspects of how the Parking Levy will integrate with the LGWM programme, including:

- **Hypothecation** – as detailed in **Section 9**, the proposed Parking Levy legislation will ensure that the revenue raised from the Parking Levy is ringfenced to be used to fund LGWM public transport, active modes and TBC initiatives. A similar arrangement exists for the Nottingham, Sydney and Perth Parking Levy schemes.
- **Political leadership and support from all of the LGWM partners will be essential to ensure successful delivery of the Parking Levy.** The proposed Parking Levy is a contentious project and many proposed schemes in the UK (eg In Manchester, Bristol) have not been implemented due to lack of political support and leadership. The South Australia government introduced the idea of an Adelaide Parking Levy in 2012, but it was scrapped in 2014 due to a lack of political support – which included the opposition of the relevant council, the City of Adelaide, which was also one of the major owner/operators of parking buildings. (Source: <https://www.cityofadelaide.com.au/media-centre/no-means-no/>).
- **Impact of other LGWM packages on parking supply** – Other LGWM projects may result in a reduction of on street metered parking spaces. Displacement of this parking to casual off-street public car parks will not be subject to the Parking Levy since as detailed in **Section 6** it is proposed that unused spaces in public car parks after 1000 on a weekday are exempt and this could be a behaviour response of public car park operators to provide more casual short stay parking spaces than reserved long stay commuter parking spaces.
- **Timing and when other LGWM packages happen** - The LGWM RPI indicates that by 2024 key public transport and walking and cycling improvements will be in place including:
 - Thorndon Quay/Hutt Road – prioritising buses and improving walking and cycling.
 - Increased rail capacity.
 - Connected central city cycleway network.

- Golden Mile – prioritising buses and improving walking and cycling.

By 2029 the RPI indicates the following will be implemented:

- Further rail enhancements.
- Mass transit city to Newtown.
- Extra Mt Victoria tunnel.
- Basin improvements.
- Bus priority to and from the city along core routes.
- New dedicated walking and cycling access through Mt Victoria.
- Ruahine St/Wellington Rd widening.

After 2029, the RPI indicates the following will be implemented:

- Mass transit – Newtown to airport Ngauranga to Aotea Quay.
- Extra Terrace Tunnel.
- Vivian St transformed into a two-way city street with walking and cycling enhancements.
- Relocate SH1 southbound from Vivian St into a new tunnel under Te Aro.
- New city park over Te Aro tunnel.

As detailed in **Section 7**, the assumed first year for the Parking Levy is 2025. This integrates well with the LGWM programme since, by 2025 there will be in place improvements to public transport and active modes which the Parking Levy will be dependent on for its successful introduction. Furthermore, the revenue raised by the Parking Levy will help fund post 2025 proposed LGWM rail enhancements, mass transit, bus priority measures and active mode enhancements. Furthermore, as detailed in **Section 9**, it is estimated that it will take 4 years to implement the Parking Levy, and as such, 2025 is the earliest year that the Parking Levy would be operational. If the Programme timings change, thought will need to be given to the timing of the introduction of the Parking Levy.

In terms of assessing how the Parking Levy interacts with the other LGWM packages, this will be addressed in the overall WTSM evaluation of the LGWM packages to ensure the benefits of the Parking Levy are assessed as part of the wider package of measures.



3.4 Parking Levy Evaluation Criteria

The following initial set of evaluation criteria has been established to evaluate the effectiveness of the Parking Levy and our assessment is presented in **the Executive Summary**:

- Strategic Fit - how does the Parking Levy fit with LGWM and its partners strategic outcomes for the area and the objectives set for the Parking Levy?
- Acceptability/Feasibility – how easily can the Parking Levy be implemented and how is it acceptable politically, by the public and by stakeholders? This would also include transparency and accountability of the Parking Levy.
- Effectiveness – how effective is the Parking Levy in meeting its objectives?
- Efficiency – how efficient is the Parking Levy eg its 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, costs to setup and administer the levy, including compliance costs for liable parking spaces. Are there any undesirable spin-off effects?
- Affordability – the extent to which the Parking Levy is affordable, i.e. the cost of it compared with what people are willing to pay.

4.0 ECONOMIC FRAMEWORK AND LITERATURE SUMMARY

4.1 Overview

The economic framework we use for understanding the effects of a parking levy is:

- Estimate supply and demand curves for commuter parking, based on real data wherever possible. Data sources include our parking inventory work and commuter survey, as well as academic research and observations of other cities which have a parking levy in place.
- Estimate the supply and demand responses to a parking levy.
- The new number of spaces supplied/ demanded is then used to estimate the scheme revenue (in **section 7**, Financial Modelling)
- The 'deadweight loss' is also estimated and informs **section 8**, Economic Appraisal.

It is important to understand the current number of commuters/ parking spaces, and the prices being charged. We then need to understand the price elasticity of demand (via our commuter survey and academic research) and make some inferences on the price elasticity of supply (via looking at how prices have changed in other cities in response to levy increases).

Potential extensions to this framework, or scenarios to test, could include:

- Distinguishing between public and private car parks, or user-paid vs employer-provided parking.
- Allowing for prices to vary between areas (e.g. prices are typically lower in Te Aro).
- Sensitivity testing for elasticities or 'pass through' (incidence).
- Testing different levy amounts.
- Explicitly accounting for 'casual' parking, allowing parking owners to switch between providing commuter and casual parking.

Our finance model uses or tests all of these extensions except for the last one. However, we note that any parking spaces that stop being used by commuters will be available for casual use; the owners/ operators of the parking spaces may still be able to derive some revenue from them.

4.2 Distinguishing Between Private and Public Car parks

Public and private car parks have different groups involved, and it is likely that they will have different responses to a parking levy. As such, our finance model treats them separately. Private car parks involve the following groups:

Figure 4.1: Overview of Private Carparks



In **Figure 4.1**, 'building users' are mainly office tenants. They might have a number of fleet vehicles, with some stored on the premises and others which staff members also use for commuting (2013 census data suggests that 3,000 drivers, 11% of the total 24,000 drivers, drove to work in a "company car, truck or van"). Our Stated preference survey indicated that 10% used a company car to drive to work in the CBD.

Some carpark might be set aside for visitor/ customer use, but the vast majority of carpark are likely to be for staff use and used on a 'long-stay' basis, i.e. the same car stays for more than just a couple of hours.

Although most private carpark are leased by building users, some are rented out on a weekly or monthly basis with more casual arrangements. This would include carpark rented out on TradeMe, by apartment residents or by property owners/ businesses who have spare carpark.

Public carpark involve the following groups:

Figure 4.2: Overview of Public Carparks



The five property owners in **Figure 4.2** are shown as examples – there are of course many other property owners who make their carparks available as public parking.

The number of carpark operators is much smaller, as detailed in **section 5**. Wilson Parking is the largest operator, and they own a small number of their carparks; however, most of their carparks are leased from the property owner or managed on behalf of the owner. CarePark also only own a small number of their sites. Conversely, Primeparking and WCC own most of the carparks they operate.

With a lease, the carpark operator pays the property owner a fixed rent, although in rare cases the rent may increase if parking revenue is above a certain threshold. The business risk sits with the operator, and they need a reasonable profit margin to compensate for this risk. Profit margins vary from site to site, but in some cases rent accounts for more than 50% of revenue, other expenses still need to be paid, and Australian figures suggest the net profit margin is usually below 20% of revenue.

Rents usually increase over time based on CPI adjustments (which can be every 1-3 years) or through market reviews (which tend to be only every few years if they exist at all). Lease terms are usually many years long, with ‘rights of renewal’ that can extend this further. For development sites, leases can be short-term and may include redevelopment clauses so the property owner can terminate the lease when they are ready to develop.

With a management agreement, the carpark operator pays the property owner the vast majority of revenue and receives a small management fee, typically 3%-6% in Australia although performance bonuses may increase this. The property owner usually has control over pricing. We understand that most of CarePark car parks are management agreements but on the whole most Wellington public carparks are leased rather than managed.

Looking at the three types of parker in **Figure 4.2**:

- We define “casual” parking as short stay, charged by the hour (or sometimes by the half hour). Most cars are likely to be staying no more than an hour or two.
- We define “commuter” parking as long-stay, charged as earlybird/ 12-hour rate etc on a daily basis, where there is no longer-term relationship between the operator and the parker.
- “Leased/ monthly” reserved/unreserved parking is typically long-stay but there is a longer-term relationship between the operator and the parker. This has some important implications. For the operator, it removes the risk of not filling the park and not earning enough revenue. For the parker, it may encourage them to drive more often as the marginal cost of parking for an extra day is zero.

Figure 4.2 could apply to on-street public parking (where WCC is the owner and operator, and the focus is on “casual” parking), but our focus is primarily on off-street commuter parking.

It is important to understand that most CBD carparks are long-term considerations:

- Most carparks have been created as part of a building which could have a lifetime of 50+ years (although it may have a shorter remaining lifetime, or a shorter economic lifetime).
- The majority of carparks in the CBD (including most ‘private’ carparks and most ‘public’ carparks that are not directly owned) are leased, and these leases might have a term of 5-15 years.
- The majority of leased carparks are likely to form part of a lease for office space, with an equally long lease. Most of the rent paid will be for the office space, rather than the carparks. We estimate that parking costs are typically less than 10% of the total occupancy cost for office tenants, since only a small proportion of staff get parks.

- For property owners especially, carparks need to be assessed using a long-term horizon. This is also true of ‘building users’ and ‘carpark operators’ although over a slightly shorter horizon.
- The effects of a parking levy will take some years to fully emerge, as rents get reviewed and as new leases are signed.
- It is likely that building users would start to unbundle carparks from their leases in response to a parking levy; they might choose to occupy fewer carparks, or for shorter periods e.g. month-to-month rather than multi-year. This would be a positive change.
- Indeed, technology is starting to facilitate this process even without a parking levy – apps like Parkable help companies to make more efficient use of their leased spaces, or to rent out excess spaces. Work-from-home trends sped up by Covid would also speed this process along.

Platforms like Parkable could also be considered carpark operators, and they blur the line between private and public parking. They can allow the owner/ lessee of a private carpark to rent it out on an hourly or daily basis when it is not in use, or on a longer-term basis.

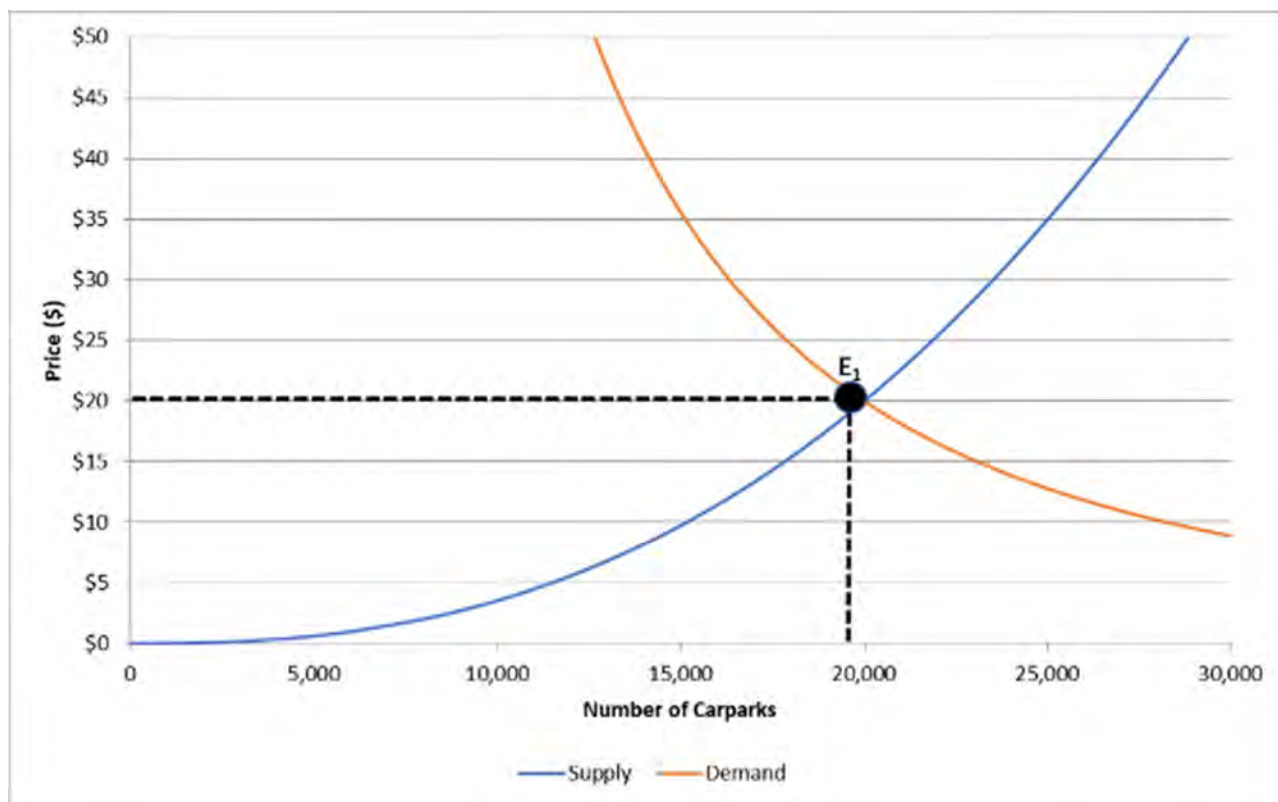
Some carparks are operated by Wilson or another company but only offer monthly parking. These also blur the line somewhat – the operator may have the discretion to convert them over to hourly/ daily parking – but we treat them as private parking.

4.3 Elasticity

We use ‘elasticity’ as shorthand for ‘price elasticity of demand’, or the price sensitivity of commuters. We use ‘supply elasticity’ as shorthand for ‘price elasticity of supply’, or the price sensitivity of carpark providers.

Figure 4.3 below shows an example of inelastic supply and demand, with an ‘equilibrium’ price of \$20 and quantity of 20,000 carparks. If the price were to double to \$40, parking supply would increase by less than double and demand would decrease by less than half:

Figure 4.3: Inelastic Parking Supply and Demand



As we explain elsewhere, there are ‘intermediate’ or wholesale markets for parking as well – governed by leases to ‘building users’ for private carparks or leases to ‘parking operators’ for public carparks. We do not consider these wholesale markets here, but they are effectively built into the supply curve.

Parking elasticities can be difficult to measure in the real world, and they are heavily context dependent. Most studies only look at demand elasticity, but supply elasticity is also important for our work (even though we will not be measuring it directly).

Recent research suggests that parking demand is more elastic than is commonly thought. Lehner and Peer (2019) carried out a meta-analysis of 50 previous studies on demand elasticity, covering both ‘revealed preference’ (RP) and ‘stated preference’ (SP) estimates, and short-stay and long-stay parking. Their findings suggest:

- RP studies might be biased, because they are often done on carparks that are almost full i.e. supply is constrained. They are only able to measure actual parking occupancy, and they may underestimate actual parking demand (i.e. there are some people who choose not to drive because they cannot guarantee getting a park but would drive if they were certain of getting one).
- SP studies are theoretically better, but they work best when there is plenty of excess capacity, i.e. supply is not constrained. Otherwise, they might not reflect real-world outcomes.
- On average, SP studies suggest a commuter parking elasticity of -1.07, but this won't reflect real-world occupancy changes. RP studies suggest an elasticity of -0.52 which may be theoretically biased for the reasons above but is more likely to reflect real-world occupancy changes.
- A likely issue for Wellington (at least pre-Covid) is that carparks are close to full and there is some ‘latent demand’ that exists. As such, if prices increase, observed occupancy would only fall by a small amount, as some of the latent demand would rush in to fill the spaces that open up. This

'latent demand' isn't measured in our SP survey as we do not survey non-drivers. As such, our survey may overestimate actual occupancy changes.

Elasticities reflect the choices made by a large number of individuals, with each person choosing how to respond to a price change. As Lehner and Peer (2019) note, "motorists can respond in multiple ways to parking policies (by changing parking location, mode, trip timing, trip destination or by abandoning the trip)". They may also keep driving as they did before.

Some factors affecting elasticity include:

- Income levels.
- Relative price of public transport (or active transport) alternatives (including the price of a person's time).
- Accessibility of public transport alternatives.
- Accessibility / practicality of active transport alternatives.
- Substitutability of other work locations with the Wellington CBD (e.g. other business hubs, or working from home)

For the Wellington CBD, car commuters are typically high-income; there are good public transport alternatives; and active transport can be practical for those living within a reasonably short distance. There are relatively few substitutes for office-based work locations, since the CBD has such a dominant role in regional office-based employment. However, working from home is now seen as a more viable alternative in the post-Covid era, even if just for a day or two a week.

Elasticities will also vary between different cities and locations (e.g. some may have better alternatives to driving), so the average figures given in Lehner and Peer (2019) cannot be applied everywhere.

All else being equal, elasticity should increase if the alternatives to driving are improved – e.g. if the LGWM programme invests in new high-quality transit. As such, our modelling includes sensitivity tests with a higher elasticity.

Supply Elasticity

As noted above, there are few studies on supply elasticity. We assume supply to be inelastic, which could reflect real-world constraints on supply, rather than how supply would change if it was completely free to do so. We do analyse supply changes for overseas cities that have a parking levy (to the extent we have data), and this supports our view.

Policymakers can also affect supply elasticity, through making it easier or more difficult to add parking. Currently, parking is regulated via parking maximums and resource consent thresholds in the District Plan. Perth used even tighter restrictions in its Parking Policy, making it difficult to add much new parking. This limits the (upwards) supply elasticity.

4.4 Introducing a Tax or Levy

For any tax, economic theory states that the burden will be split between the consumer (parker) and the producer (property owner). Prices will generally increase by less than the value of the tax. The quantity supplied/ demanded will also decrease.

The proportion of the parking levy that gets passed on to consumers will depend on the market's dynamics. In particular, it depends on the relative elasticities of supply and demand.

This is best illustrated with examples as in **Figure 4.4** below:

Figure 4.4: Effects of a Parking Levy on Price and Quantity

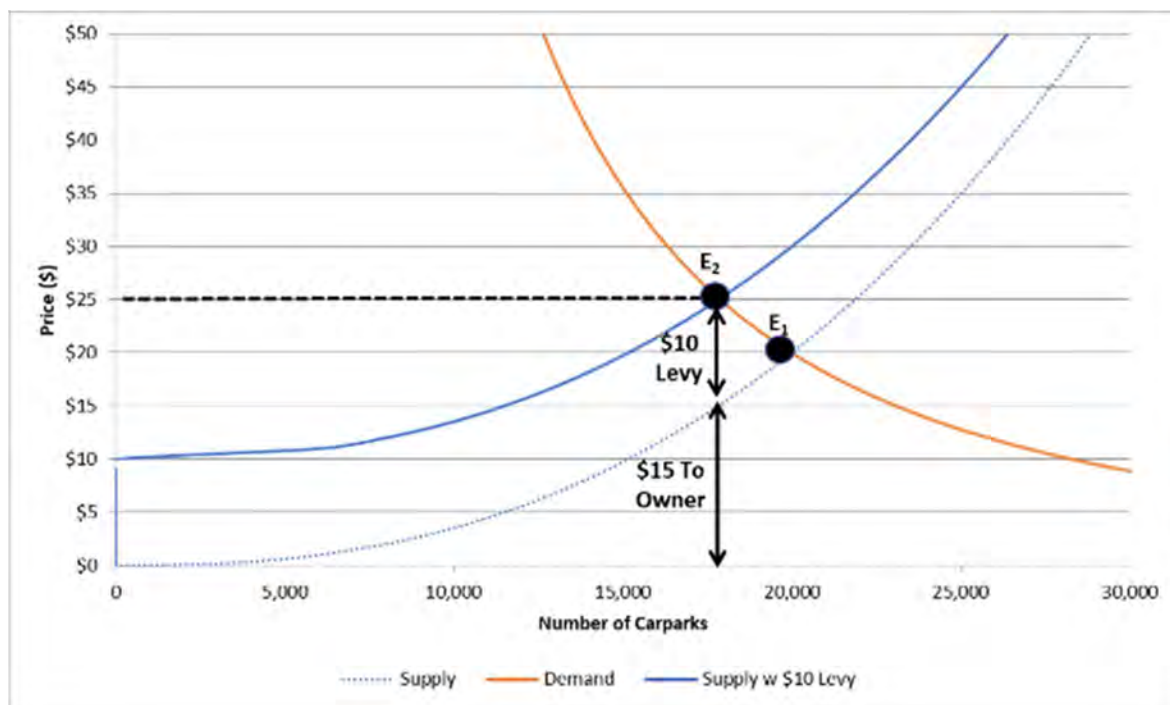


Figure 4.4 illustrates how the market first shown in Figure 4.3 would respond to a \$10 parking levy. The equilibrium shifts from E₁ to E₂, with prices rising from \$20 to \$25 or half the amount of the levy.

The number of carparks used by commuters falls from 20,000 to 17,900, a reduction of around 2,100 spaces or 11% in response to a 25% price increase. This is less than a one-for-one reduction because demand is inelastic.

Incidence and Pass-Through

The ‘incidence’ of the tax burden is shared between producers and consumers, depending on the relative elasticities of supply and demand. In Figure 4.4 parkers pay 25% more than they did before, and carpark owners receive 25% less per occupied park. We can also talk about this in terms of ‘pass through’: 50% of the levy charge has been passed through to higher prices. The burden is shared roughly equally between producers and consumers. A further analysis of the wholesale market could be undertaken to estimate how the burden falls between property owners and parking wholesalers (building users/ parking operators). We do consider this in our equity analysis at section 8.

4.5 Literature Review and Overseas Data Analysis

We have carried out a wide-ranging literature review of parking studies, commuter surveys and overseas parking levy schemes. This includes a review of academic publications as well as internal/ government reviews. We have also sourced updated data and carried out our own analysis within the parking levy consultancy team.

A more in-depth summary of our literature review is located at Appendix 4.1, and here we highlight the key points.

Commuter Surveys

Commuter surveys in Wellington and other cities have given a range of results, but they all show that a proportion of commuters will switch from driving to other modes in response to a price change.

Convenience is a big factor in choosing whether to drive and/ or park, both for people who currently drive to work and for those who don't.

Pandhe and March (2012) investigated the importance of convenient parking on Melbourne CBD commuters' mode choice, using a sample of 72 car users and 91 public transport users. They found that the most common reason for driving was that it "saves time" compared with other modes, with some noting the "availability of [a] parking space" or "lower parking fees via subsidisation".

For public transport users, 9% stated that they would shift to driving "if convenient access to a parking space becomes available, irrespective of cost" (Pandhe and March 2012). Latent demand may be important i.e. if a parking levy makes driving/ parking more convenient, some public transport users may switch to driving even if they have to pay more.

Fringe Benefit Tax

Like many countries, New Zealand grants a Fringe Benefit Tax (FBT) exemption for employer-provided parking. A small number of countries, notably Australia, where three of the existing parking levy schemes operate, don't have such an exemption.

Dutzik et al (2017) summarise the contradictions in the FBT exemption as follows:

"Imagine the creation of a new government program in which federal authorities send you a check at the end of the year to reward you for driving to work alone.

But there are a few catches. First, you only get the check if you work in a city—and you get a bigger check if you work downtown. Second, the size of your check depends on how much money you make. If you are a stockbroker or CEO, your check might be twice as big as that of the receptionist or salesperson working down the hall...

Surprisingly, such a program actually exists: the federal tax benefit for commuter parking".

The exemption is largest for people in higher income brackets (since they would otherwise pay a higher rate of tax) and those who work in places where parking is expensive (i.e. the CBD). As such, the exemption is regressive and it is most distortionary in city centres, where the negative externalities of parking and driving are highest. This is a source of inequity and it is certainly present in the Wellington CBD.

Van Ommeren and Wentink (2012) carried out a Dutch study which found that *"the policy not to tax parking as a fringe benefit increases the number of [employer-provided] parking spaces by about one third... [and] the annual deadweight loss is about €77 per parking place. So, on average, 10.2% of current parking expenses are a deadweight loss (in terms of the optimal number of parking spaces, the deadweight loss is of course much higher and is about 16%)"*. Note we define deadweight loss as a cost to society that arises from supply and demand not being at their socially optimal equilibrium – for example due to negative externalities as outlined here, or taxation.

The perverse effects of the FBT exemption could be reduced somewhat by extending the exemption to public and active modes, but this is only a partial solution: parking can cost more than \$20 a day whereas other modes tend to be much cheaper, so drivers still benefit the most. A fixed-amount travel allowance/

'cash out' (e.g. \$20 a day regardless of mode) would be a better candidate for exemption, although still regressive in tax terms.

Overseas Parking Levies: Incentives and Scheme Design

To our knowledge, no previous economic studies have made a detailed comparison of the overseas schemes against each other. Some schemes have had more attention than others: we have found three relevant studies for Perth, three for Sydney, and at least 6-7 for Melbourne. Nottingham is the most studied scheme despite being the newest, with at least ten papers of which we have focused on three recent ones, published in 2017-19.

We are especially interested in testing outcomes, and understanding the incentives faced by different groups (parkers, carpark owners and operators etc). A key aim of any parking levy in Wellington is to encourage mode shift in peak periods; for this to occur, the levy charge needs to be passed through to consumers as much as possible. Designing a levy scheme so that vacant spaces are not charged (which encourages higher prices rather than higher occupancy), and commuters are targeted rather than casual parkers, would help achieve this aim.

The different schemes overseas lead to quite different incentives. They all recognise that empty spaces are not contributing to congestion, and have provisions to avoid charging them:

- Melbourne's scheme originally focused on peak congestion, so public parking spaces were given an exemption for the day if they were not filled by a parker arriving before 9:30 am and staying for 4+ hours. This targeted commuter parks rather than casual parks. This exemption was removed in 2014.
- Sydney's scheme is also concerned about interpeak travel, so spaces are only exempt if they are vacant at 1 pm (the busiest time of the day, when casual demand adds to commuter demand).
- Perth requires that the space be 'decommissioned', e.g. roped off or otherwise unavailable.
- Nottingham's scheme applies to employer-provided parking only, but the levy cost is calculated based on the maximum occupancy of the carparks, e.g. if the carparks are never more than 90% full then only 90% of spaces are charged.

Private parking spaces which are vacant long-term (e.g. parking spaces in office buildings that aren't leased or used) would be able to avoid the levy charge in any of the four cities. Public parking spaces may be able to avoid the levy if not occupied on a given day/ time, depending on the city.

Price Trends, 'Pass Through' and Incidence of Levy Burden

From an economic perspective, we summarise the four overseas levy schemes as follows:

- Sydney: the Parking Space Levy was implemented in 1996. A major price increase took place in 2009, and since then increases have continued in line with inflation.
- Perth: the Parking Levy was introduced in 1999. A major price increase took place in 2009, with another major increase staggered over 2013-2015.
- Melbourne: the Congestion Levy was implemented in 2006. A major price increase took place in 2013 to \$1,300 (AUD). The levy initially only covered 'long stay' parks, but other parks were brought into the scheme in 2014.
- Nottingham: the Workplace Parking Levy was implemented in 2012 at £238, reaching £362 two years later and increasing with inflation since then (currently £415 ie circa \$830). It covers the entire City of Nottingham.

Few studies have looked at whether levy charges were 'passed through' and their incidence i.e. which groups are affected. These studies are mostly quite dated, and some give inconsistent results. As such, we generally prefer to focus on our own analysis of price changes within the last decade. The data we have reviewed is explained in more detail in Appendix 4.1.

Except for Sydney in 2009, our analysis of overseas data suggests that when a major levy price increase occurs, a significant proportion of the increase is 'passed on' resulting in higher parking prices for public carparks. The proportion will vary depending on competition, economic factors etc, but we are comfortable that 50% pass-through or higher is typical.

This suggests that the elasticities of supply and demand are similar to each other. Supply may be a little more elastic than demand if the pass-through is greater than 50%.

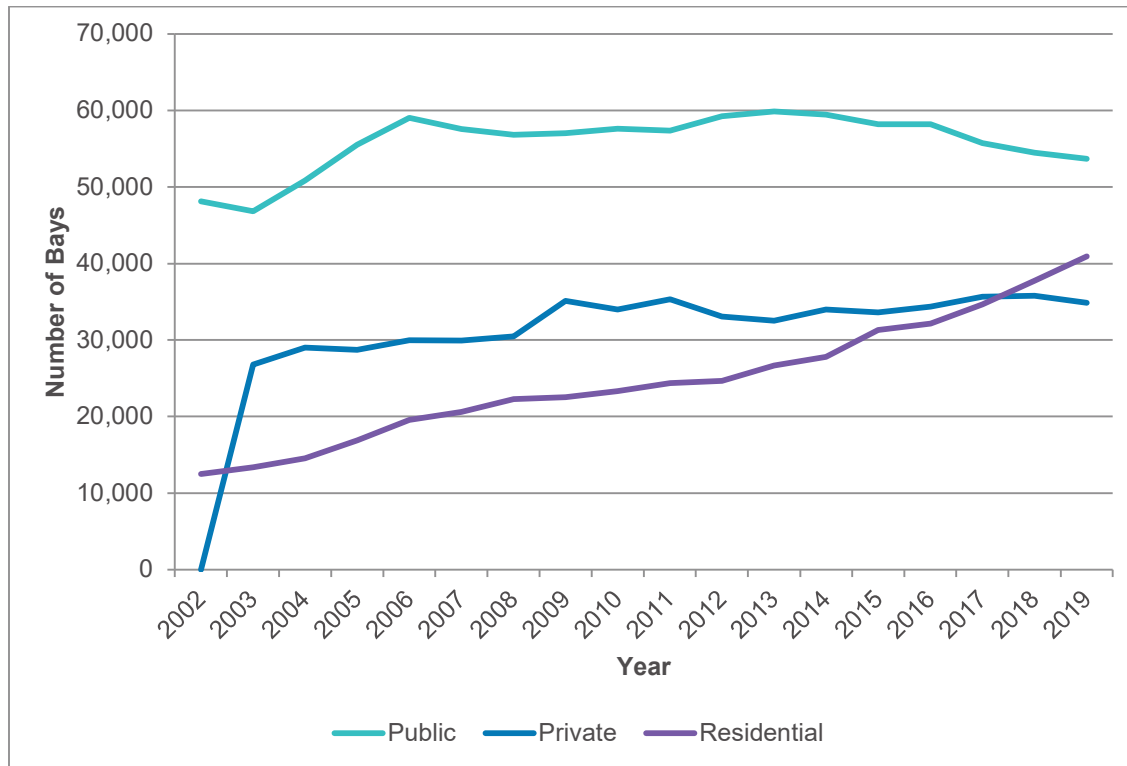
It is unclear whether the supply of private carparks is more or less elastic than the supply of public carparks. As outlined below, it appears that Sydney building users have significantly reduced the quantity of spaces they lease over the last decade. This implies a reasonable degree of elasticity.

Effects on Parking Supply (and Parking Used by Commuters)

Parking is not a very versatile land use – especially where it is part of a building – so it can take a long time for parking to transition to other uses. However, it is easier to change what the parking spaces are used for – or whether they are used at all – and parking levies can help shift behaviour in the desired direction.

Parking data for the Melbourne CBD is available over 2002-2019, covering both the pre- and post-levy period. Note that **Figure 4.5** below refers to the total number of carparks, not the number being used:

Figure 4.5: Melbourne Parking Supply in the 'Category 1' Area



Source: Melbourne Census of Land Use and Employment

The number of public and private carparks hit an initial peak of 89,000 in 2006, the year the levy was introduced, before dipping slightly and then recovering to a plateau of 92,000 parks. There is growing evidence that the number of carparks has been trending down since the latest big levy increase in 2014, especially public parking which would find it hard to avoid the levy. The number of carparks is now back to 2006 levels with 89,000 parks in 2019.

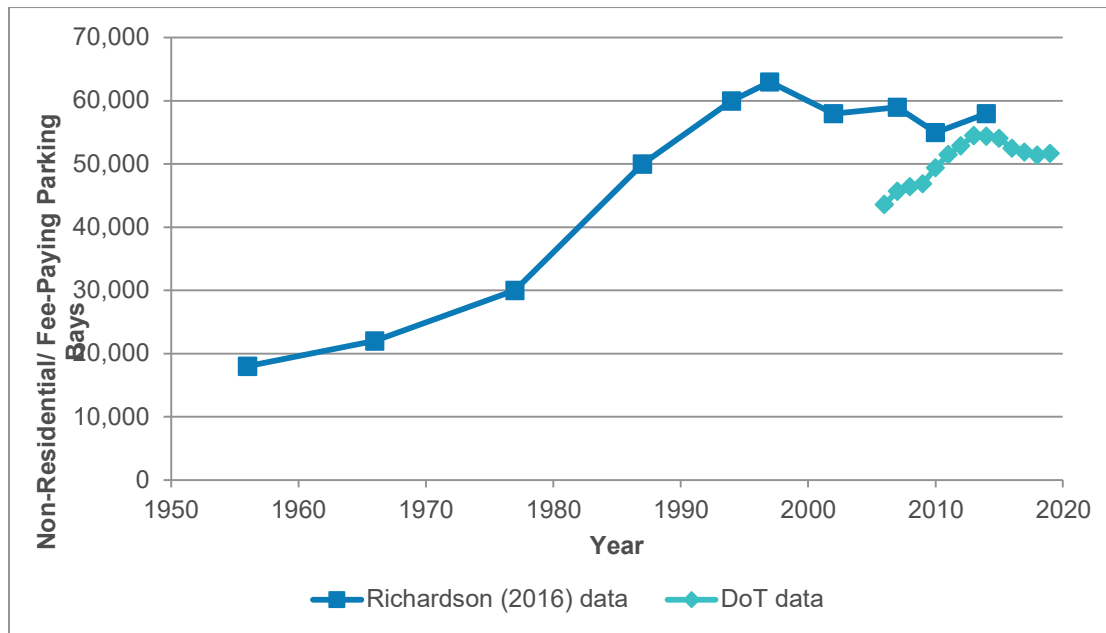
We also have indirect evidence that the number of leased private carparks has fallen too, i.e. effective supply has fallen more than the CLUE data suggests.¹

By comparison, employment has grown by 37% over 2006-2019, from 283,000 to 404,000 people. Residential parking (which does not pay the levy) has grown strongly throughout the 2002-2019 period, along with the residential population.

For Perth, we have constructed a composite graph (Figure 4.6 below) of parking supply. Again this covers the pre- and post-levy period:

¹ Tax expenditures (revenue foregone) for commercial/ private carparks have risen from \$35 million in 2014/15 to \$53 million in 2018/19. At the 'category 1' levy rate this suggests around 10,000 fewer parks being leased. The levy charge had actually taken effect at the start of 2014, so there may well have been a reduction in leased parks in 2014 as well but we do not have the data to establish this.

Figure 4.6: Perth Parking Supply in the Levy Area



Sources: Richardson (2016), WA Department of Transport

The Richardson (2016) data shows parking supply rising through the decades from the 1950s and peaking around 1997 prior to the levy’s introduction. It shows a fall post-levy, and then roughly steady supply through to 2014/15. The more recent data from WA Department of Transport shows a rise in parking supply over 2006-2013 – unlike the Richardson (2016) data – but then shows a fall since the most recent levy increases. Although the two data sources do not quite line up, or show consistent trends, they both suggest that the levy has an effect on parking supply.

Perth employment grew strongly up until 2011, with more modest growth over 2011-2016.

We received detailed Sydney parking data for 2010-2019 from the levying authority, Revenue NSW as shown on Figure 4.7 below:

Figure 4.7: Sydney Liable and Equivalent Levied Spaces in the Category 1 Area, 2010-2019

Financial Year	Total Spaces (A + B)	Exempt Spaces (A)	Liable Spaces (B)	Casual Concessions	Unlet Concessions	Equivalent Unused Spaces (C)	Equivalent Levied Spaces (B - C)
2010	56,087	4,535	51,552	\$12,675,452	\$9,754,607	11,215	40,337
2011	56,088	3,800	52,288	\$13,287,418	\$14,307,369	13,527	38,761
2012	56,344	4,378	51,966	\$12,278,240	\$15,100,549	13,038	38,928
2013	57,284	4,325	52,959	\$16,382,514	\$17,069,852	15,487	37,472
2014	58,566	4,365	54,201	\$17,157,118	\$17,518,016	15,690	38,511
2015	59,036	4,388	54,648	\$17,752,774	\$18,595,891	15,735	38,913
2016	57,535	4,257	53,278	\$14,691,340	\$22,096,008	15,654	37,624
2017	58,171	4,842	53,329	\$15,652,590	\$21,640,214	15,604	37,725
2018	58,255	4,953	53,302	\$11,670,554	\$28,441,905	16,440	36,862
2019	58,529	4,969	53,560	\$11,796,378	\$28,657,099	16,246	37,314

Source: Revenue NSW

“Exempt spaces” are not levied and include residential, bike, disabled parking or loading zones. All other spaces are liable to pay the levy but may receive concessions for days/ periods that they are not being used. “Unused spaces” are those which are in a public carpark and unoccupied at 1 pm on a given day, or in a private carpark and not currently leased. The concessions for unused spaces are calculated on a daily basis, and we convert them to an annual equivalent number of spaces. For example, the total value of concessions was \$25.8 million (AUD) in 2009/10 based on the data we received from Revenue NSW, equivalent to 11,215 spaces (at \$2,000/ year).

This table shows that, while the total number of spaces (and the liable number of spaces) in the Category 1 area has grown over 2010-2019, the effective number of liable spaces has fallen – i.e. a larger proportion of concessions are being claimed.

The “unlet concessions” figures suggest that the number of unlet private parks has grown from 4,877 in the first year following the price increase, to 11,509 in 2019. This suggests that, as office tenants renegotiated their leases in the years following the levy increase, they leased fewer and fewer spaces. This is a significant behaviour shift – the equivalent of 6,632 spaces or more than 10% of the Sydney total over a decade. Private carparks make up a little over half the total number of spaces in the CBD, so it is equivalent to building users reducing the number of spaces they lease by around 20%.

Nottingham is quite different to the Australian schemes and has less in common with the Wellington CBD context. It had a lot of excess/ low-value parking prior to the levy, and employers reduced their number of liable spaces by an estimated 17.5% after the levy was announced but before it took effect. The number of spaces has stabilised at around 75% of its pre-levy level. This is a more substantial response than we would expect for a well-developed CBD where parking is already priced.

Effects on Travel Patterns

The overseas levy schemes haven’t always managed to reduce the number of drivers, but then this is not necessarily their goal: they are aiming to manage or reduce congestion, or to raise revenue for non-car modes. We note that in all cities, the number of drivers has been flat or increased very slightly whereas the total number of employees has increased much more. As such, there has been mode shift in percentage terms, even if not in numerical terms.

- The number of ‘journeys to work’ in Sydney have risen from 321,000 to 452,000 over 2006-2016. The number of driving trips has risen from 86,000 to 94,000, an increase of 8,000 or just 6% of total trip growth.
- The number of ‘journeys to work’ in Melbourne have risen from 263,000 to 389,000 over 2006-2016. The number of driving trips has risen from 99,000 to 117,000, an increase of 18,000 or just 14% of total trip growth.
- The number of ‘journeys to work’ in Perth have risen from 97,000 to 115,000 over 2006-2016. The number of driving trips has fallen slightly from 46,000 to 45,000.
- Parking supply has also been very flat in the three cities. Supply in both Melbourne and Perth has been trending down since their latest major levy increases (in 2014 and 2013-15 respectively), whereas as we show in **Figure 4.7** Sydney has seen an ‘effective’ supply decline, i.e. a decline in the number of spaces actually occupied.

Economic Effects

No previous studies have found conclusive evidence of parking levies making a significant difference to a CBD’s competitiveness, either positively or negatively. Generally, they find that parking levies helps congestion and (via hypothecated funding) supports mode shift.

In practise, it is hard to isolate the effects of the levy itself from the effects of other changes (e.g. transport infrastructure investment, economic cycles). We note that all four cities have continued to grow employment in the levied areas over the long term.

Ison et al (2014) writes that “the attitude of businesses has not been a key feature of the [Sydney levy] implementation” as the levy is low compared to CBD worker incomes and business ‘location costs’ and driving mode share is below 30%. Ison et al (2014) also note:

“Periodic reviews of the PSL (Parking Space Levy) legislation have prompted advocates to argue against the PSL. The Property Council (2004), for example, which advocates for the property industry, argued not so much against the tax per se but for its failure to control congestion particularly in the Sydney CBD. Related to this is the bigger issue as to whether the PSL has the intended ‘bite’ to encourage behaviour change with little and mostly anecdotal evidence that users are not aware of the PSL being passed directly to car users, whether in dedicated employer spaces or in casual parking. Clearly behaviour change could be stronger if there was greater awareness of the levy and its motivation rather than relying solely on a price signal”.

As per our data analysis for Sydney, the effects of the 2009-10 levy increase have kept flowing through with ongoing reduction in leased private parking since Ison et al (2014) were writing.

Richardson (2010) writes that “many developers and their commercial consultants argued that the limitations on parking supply would hold back development in the City of Perth... [but] there is no evidence that this has occurred”.

In a subsequent paper, Richardson (2016) gave a clear endorsement of the Perth levy:

“Even those who were cautious or opposed to the parking policy in the late 1990s now accept that it has been a catalyst (along with improved public transport) for positive change that has enabled the city to grow strongly with less car traffic. This has brought about a major change in mindset at the Perth City Council, where the policy position has changed from ‘Your Car is as Welcome as You Are’ in the 1980s to ‘People First, Public Transport Second and Cars Last’” (Richardson, 2016)

Dale et al (2017a) note that the Nottingham parking levy of £379 (\$758) per space per year is only a small proportion of the costs faced by businesses, estimated at less than 1% of their turnover. As such it is a very minor factor in their locational decisions. Conversely, there is some evidence from the case studies that Nottingham’s good quality public transport – supported in part by the parking levy – is an incentive for businesses to locate there.

Dale et al (2017a) draw on a range of different data sources including employment data, economic output, commercial property indicators, and case study information from NCC as to why businesses relocated to or away from Nottingham. None of these data are conclusive in themselves, but together they paint a picture of an economically healthy (and growing) city which remains an attractive location for businesses.

Overall, Dale et al (2017a) conclude that “there is strong evidence that the WPL is not having a significantly negative impact on inward investment”. They also find that “Nottingham remains relatively attractive to investors [and] there is emerging evidence from investment case studies that the public transport improvements are playing a role in this”.

Summary

In respect of the international Parking Levy schemes, summarising our literature review and our additional data analysis in **Appendix 4.1**:

- Commuter surveys have given a range of results, but they all show that a proportion of commuters will switch from driving to other modes in response to a price change.
- Convenience is a big factor in driving/ parking, both for people who currently drive and for those who don't. 9% of Melbourne public transport users stated that they would shift to driving if they had convenient parking, "irrespective of cost". Latent demand may be important i.e. if a parking levy makes driving/ parking more convenient, some public transport users may switch to driving even if they have to pay more.
- Fringe Benefit Tax exemptions for parking have perverse effects: they are regressive in tax terms and encourage driving in the places where this is most damaging. They create a deadweight loss.
- Overseas parking levies have led to an increase in parking costs, with some share of that (typically over 50%) passed on to consumers.
- These higher prices incentivise consumers to change behaviour. The lower return to the parking providers also incentivises them to change behaviour. Levy design can shape these incentives.
- We see this behaviour change through mode shift (fewer drivers or at least a smaller proportion of drivers) and fewer spaces being leased by building users.
- We have evidence that the total number of public/ private carparks has fallen in Melbourne and Perth since parking levies were introduced or since substantial price increases occurred. We have evidence that the effective number of private spaces being used has fallen in Sydney and Nottingham (with suggestive data for Melbourne and no data for Perth).
- For Sydney, the effective number of leased private spaces has fallen by around 20% in the last decade, since the 2009-10 price increase.
- Census 'journey to work' data shows that the number of driving trips over 2006-2016 rose in Sydney and Melbourne and fell slightly in Perth. All three cities saw substantial employment growth over this time, so there was mode shift in percentage terms, even if not in numerical terms.
- It should be noted that the overseas levies don't necessarily aim to reduce the number of people driving, but instead to manage or reduce congestion, or to raise revenue for non-car modes.
- There is no conclusive evidence of parking levies making a significant difference to a CBD's competitiveness, either positively or negatively.
- They do assist congestion and (via hypothecated funding) support mode shift. As such, their effects should be positive in theory, even if they are hard to isolate.
- No growing city, with or without a parking levy, has managed to eliminate congestion. However, the levies have played a role in mitigating congestion and curtailing the number of people who drive, even as total employment has grown.
- Parking levies have usually been introduced as part of a suite of measures, and the way the funds are used is also important. In most cases, the funds are hypothecated for local transport improvements.

5.0 PARKING INVENTORY

5.1 Overview

The best existing source of information on carparks in Wellington is WCC's Rating Information Database (RID). The RID is used to assess the rates payable by each property in the city. In order to do this, the database must estimate each property's value (Capital Values are updated every three years) and understand other factors about the property that affect its value, including the property use, floor area, building condition and number of carparks.

WCC's Land, Customer & Property Information team provided an Excel spreadsheet with information on 13,805 properties or property components (e.g. unit titled apartments or office floors, separately titled carparks) across four suburbs: Wellington Central, Pipitea, Thorndon and Te Aro. Their extent is shown in **Figure 5.1** below:

Figure 5.1: RID Database Extent



The extent of these four suburbs differs slightly from our recommended Parking Levy area but they will give very similar numbers overall.

We were initially sent an RID spreadsheet on 11th August 2020 (“ZA0100_wgtn_no-personal-4suburbs.xlsx”) and circulated some initial findings to WCC on 19th August. We found that a number of carparks were missing from the dataset, often because the properties were missing spatial data. We were then sent a revised spreadsheet on 1st September (“9800_combined-no-personal-data-4suburbs.xlsx”), which added those properties in.

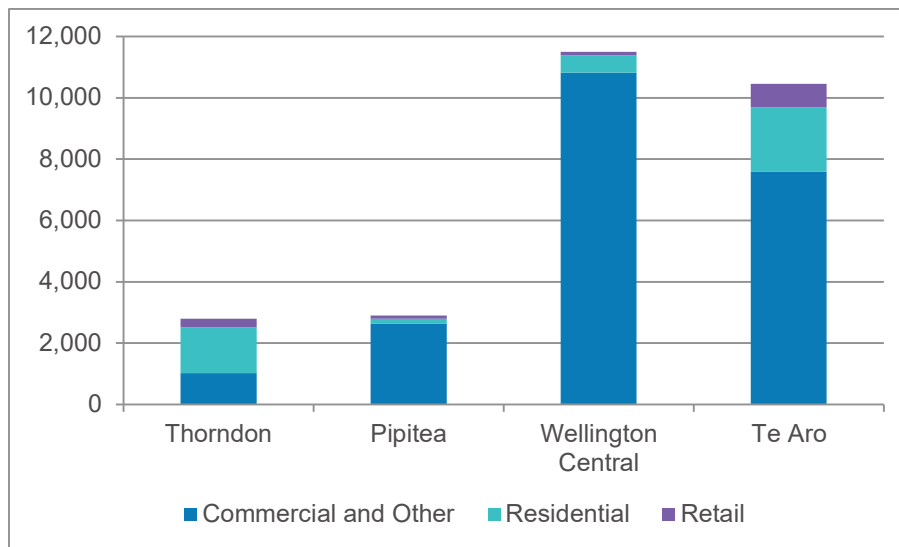
Overall, we have found the revised RID spreadsheet to be reasonably accurate for our purposes, although there are still some examples of inaccurate or missing data. It will of course be possible to keep improving the database over time.

We carried out some data validation exercises, and we also made some adjustments and corrections to the spreadsheet for our purposes, where we are reasonably certain of the correct number of carparks and their land use. We describe our data validation and corrections in **Appendix 5.1**.

5.2 Summary Statistics

Overall, our ‘adjusted’ data shows 27,660 parking spaces across the four suburbs. Based on WCC land usage codes, there are 4,329 residential spaces (codes 9, 90, 91, 92 and 98), 1,281 retail spaces (code 81), and 22,050 other spaces which we refer to as “commercial and other” below. **Figure 5.2** below shows the results for each suburb:

Figure 5.2: Parking Spaces by Suburb and Land Use



Our starting point for modelling a parking levy is the ‘commercial and other’ figure of 22,050 parking spaces. This figure excludes WCC’s 3,270 on-street metered spaces, on-street unrestricted spaces, residents’ parking spaces, and clearways, and several thousand coupon spaces close to the CBD. These on-street spaces are not associated with individual properties.

We note some other factors below which may affect the number of leviable parking spaces:

- The ‘local government codes’ show that 846 parking spaces are associated with properties which are 100% non-rateable (e.g. most Crown and council properties, Te Papa, schools, religious and

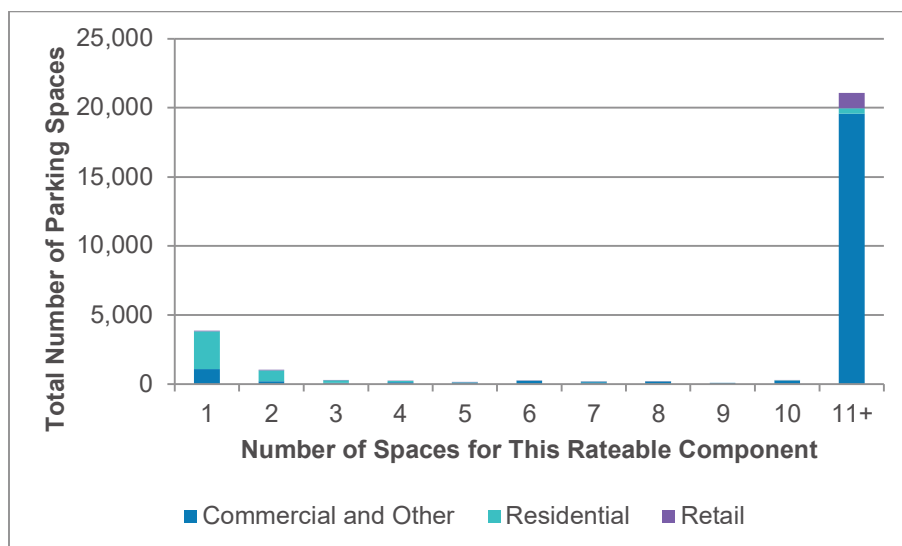
charitable properties, and some Māori land) and 1,307 are associated with properties which are 50% non-rateable (e.g. Sky Stadium), giving a total of 2,153 parking spaces.

- Similarly, we note that at least 1,700 of these parking spaces in 50% or 100% non-rateable properties are operated as public carparks (see **section 5.5** below).
- Wellington has a large number of embassies, consulates etc. These are excluded from some overseas levy schemes. However, if the levy is targeted at 'property owners' then most embassies could theoretically be levied, except where the foreign government is the property owner and refuses to pay. We have identified 147 parking spaces which have a foreign government as the property owner, as most embassies and consulates occupy leased space in office buildings. This figure may be a slight underestimate, but it suggests that embassies are only a very small share of the total.
- Many commercial properties sit on WCC leasehold land, e.g. the Victoria Street Parking Centre and many office/ apartment buildings. Since the buildings on those sites are owned by ground lessees rather than WCC and they are not used for civic purposes, it appears that they are still required to pay rates. The design of any scheme will need to ensure that whether a parking space is leviable or not ideally depends on how that space is used, rather than who owns the land.

The charitable/ 'public sector' properties need to be considered carefully: in overseas levy schemes, they would often be excluded, but this could undermine the objectives for a levy in Wellington as they make up a significant number of parking spaces.

We have also looked at the number of parking spaces associated with each rateable component, as shown in **Figure 5.3** below. Some overseas levy schemes exclude properties with fewer than 5 or 10 parking spaces, to reduce administration and compliance costs (for both the levying authority and carpark owners).

Figure 5.3: Carparks by Number of Parking Spaces for the Rateable Component



This shows that most residential rateable components have only one parking spaces associated with them. The vast majority of 'commercial and other' properties have 11 spaces or more: 19,575 spaces out of the total 22,050. This increases to 20,416 out of the total 22,050 if we look at properties with 6 or more parking spaces.

In practise, there are many cases in Wellington where parking spaces are individually titled but there are many titles owned by the same company. Any levy scheme should be designed to charge these

companies if they own 11+ spaces in total (or possibly 6+) – otherwise, owners could unit title their spaces to avoid liability.

As such, the figures of 19,575 and 20,416 above are likely to be conservative for determining how many parking spaces are leviable – although offsetting this are the other likely exemptions, e.g. mobility parking spaces, loading zones and (potentially) spaces that are used by casual short-stay users rather than commuters.

5.3 Residential Parking Spaces

With our amendments to the data as noted above, the RID suggests there are 4,329 residential parking spaces in the CBD. This figure seems plausible. Our analysis of census data suggests that CBD households had access to 4,600 vehicles in 2006, 5,000 in 2013 and 5,500 in 2018, reflecting a growing CBD population.² Some of these vehicles will be parked offsite, e.g. at their workplace, in a ‘leased’ monthly carpark, or on-street in a nearby suburb. There are at least 500 resident parking spaces available in Te Aro and Thorndon.³ Furthermore, the CBD definition we have used for analysing census data is a little wider than the one used for the WCC spreadsheet, including some households around Kaiwharawhara.

We also note that during New Zealand’s Alert Level 4/ 3 lockdown in March and April 2020, WCC stopped charging for its metered parking spaces and occupancy ran at 90% over this time – leading to complaints that the spaces were not available for essential workers. This suggests that even with most workers and visitors not coming to the CBD, many apartment residents found it more convenient to park on the streets rather than where they had previously parked. This gives anecdotal support to the idea that some CBD residents usually park their cars in the nearby suburbs.

Another consideration is that some CBD residents will lease their carparks out to commuters. This has always occurred to a noticeable extent, with TradeMe currently the main platform (20+ listings at present) and others including SharedSpace and AnySpace. Apps like Parkable are not yet prevalent in Wellington but are likely to become more common in future.

Depending on the levy design, residents may well become more likely to lease out their carparks, especially if they can avoid the levy and therefore undercut the competition. In Melbourne, residents become liable for the levy if they rent their spaces out to non-residents, including via park-sharing websites.⁴

5.4 Retail Parking Spaces

Following our amendments to the raw RID data as noted above, we estimate there are 1,281 retail parking spaces in the CBD – that is, spaces associated with properties in the “retail” land use category.

Many CBD retailers do not provide any shopper parking – e.g. those along Lambton Quay including major stores like Farmers, David Jones and the metro supermarkets. Retailers in the ‘fringe’ areas such as Thorndon or Te Aro are more likely to provide shopper parking, including retailers who operate as showrooms, ‘trade suppliers’ etc.

² These numbers are for the following SA2s: Pipitea-Kaiwharawhara, Thorndon, Wellington Central, Dixon Street, Vivian West, Courtenay and Vivian East.

³ Source: “Parking Policy Review Background Information and Issues Report” page 53, 21 January 2020, WCC

⁴ <https://www.commercialrealestate.com.au/news/cbd-residents-renting-out-parking-spots-slugged-with-congestion-levy-18560/>

5.5 Further Comments on Public Carparks

“Public parking” is an important subset of the overall parking inventory. We created our own database of public carparks in the CBD, using 2017-18 work carried out by WCC as a starting point. The earlier work by WCC included information on how many spaces each carpark had, who the operator was, and what the prices were. We expanded the database to include price trends over time (collected for 2007-2020 as described in **section 5.7**), and whether the property owner was private, public or not-for-profit sector.

We excluded the following types of public carparks:

- Carparks located outside the CBD (e.g. Skyline, Massey University, the hospital).
- Carparks on retail properties (eg 50 and 87 Tory St, and Top of Tory), noting that all three of these are primarily used as shopper parking and don't offer long-stay parking.
- Carparks which are currently or permanently closed (Michael Fowler Centre, James Smith, the pre-earthquake Reading Carpark -see image below, etc).
- Carparks which are monthly only and don't offer casual/ commuter parking. These carparks would still be subject to a parking levy, but we treat them as 'private' rather than 'public'.

Demolition of the Reading multi storey car park

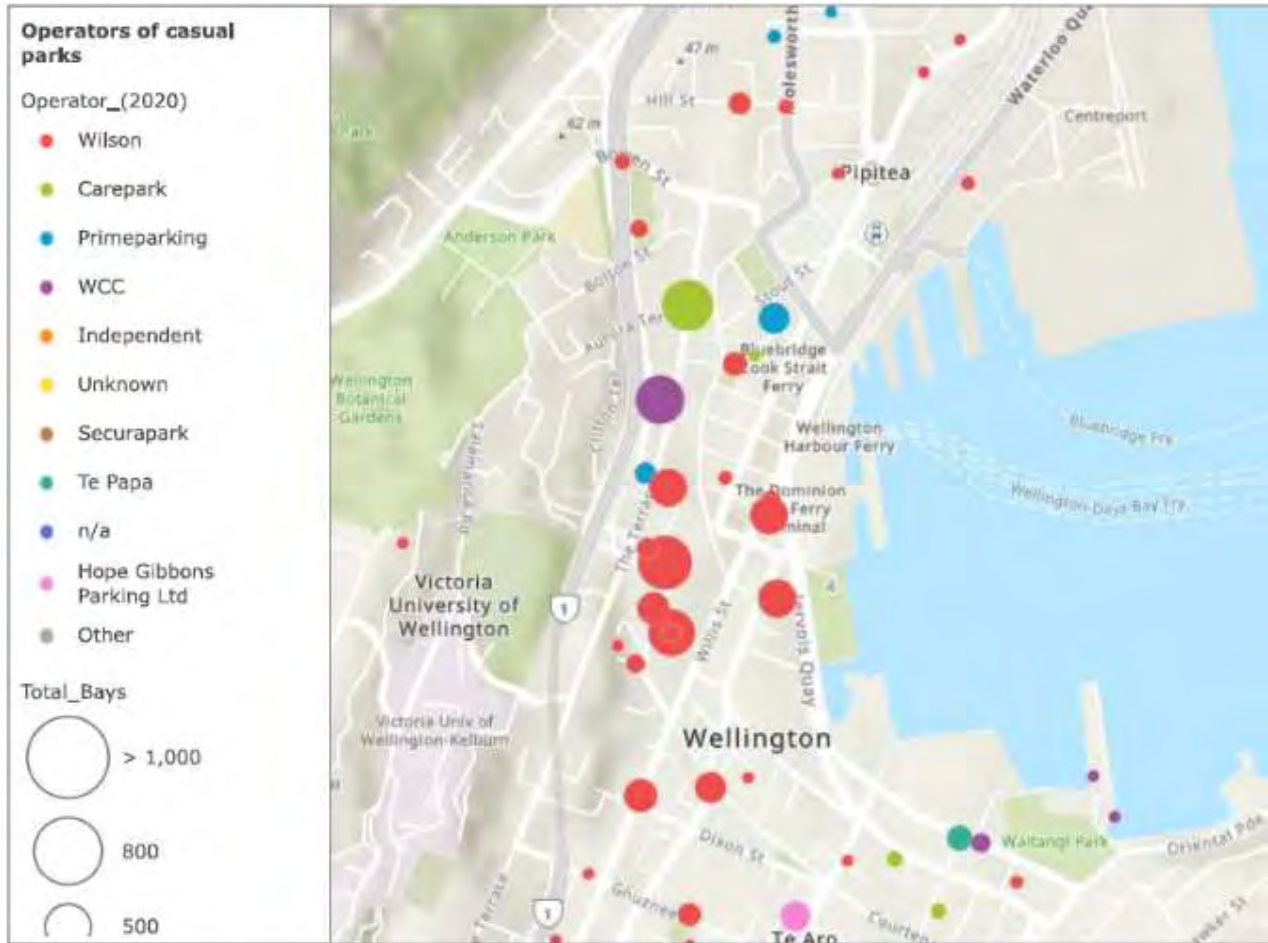


Our final numbers for public parking were 10,094 spaces across 60 different facilities. This is 46% of the total 22,050 'commercial and other' spaces in our parking inventory.

The major operators are Wilson Parking (6,046 spaces or 60% of the total number of public spaces), Carepark (2,128 spaces or 21%), WCC (771 spaces or 8%) and Primeparking (617 spaces or 6%). The only two independents included are Hope Gibbons and Te Papa, although we note that Te Papa does not provide long-stay parking (There is another independent operator, SecuraPark who offer monthly leases only at 1 car park).

The public carpark are shown visually in **Figure 5.4** below, with the large stadium carpark further to the north not visible here:

Figure 5.4: Public Carpark by Size and Operator



In addition to the carpark owned or operated by the WCC, there are several other major carpark which are owned by public sector, charitable or other non-profit organisations but which are operated as paid public parking. These include:

- Sky Stadium (750 spaces).
- Churches, marae, the Royal Society, Public Trustee and Wellington Tenths Trust (557 spaces).
- Te Papa (232 spaces).
- Government entities such as NZTA (190 spaces).

This comprises more than 1,700 parking spaces, and the issue of how they are treated is important for any levy design.

Although we don't have a time series of how the number of parking spaces in the CBD has changed in the past, we note the following:

- Earthquakes have had a significant impact on parking supply in the last decade, with the 2016 earthquakes most significant. The James Smith carpark was affected by quakes in July 2013 and

was repaired before reopening in mid-2015. It has been closed again ever since the November 2016 quake. The multi-storey Reading Carpark was demolished and later reopened with ground level parking only. The Marion Street carpark was closed for most of 2017 while it was repaired. The earthquakes have also been a factor in several WCC carpark closures.

- Development activity is another key driver of changes. Several WCC carparks are being redeveloped, and the same is true for the private sector with Willis Bond’s developments on Dixon St/ Victoria Lane, and development in Thorndon Quay as well.
- Some carparks also shift between ‘public’ and ‘private’ depending on changes of use – e.g. the Cumberland House carpark is now used by a rental car company rather than for public parking. Chews Lane and O’Reily Avenue have changed from public to private parking, whereas the Victoria Street Parking Centre changed from private to public. The distinction between public and private parking is often a small one and getting smaller with apps like Parkable.
- Overall, the number of public parking spaces seems to have fallen by at least 2,000 since 2016, although the number of private spaces has probably increased due to new buildings being developed.

Other data such as GWRC’s cordon survey shows very little effect of the 2016 earthquakes on the number of people driving, so it is likely that there was an ‘oversupply’ of parking pre-2016 and that this has now reduced. This may be true more for Te Aro (where most of the parking spaces were lost) than for the central parts of the CBD.

5.6 Comparing the Parking Inventory to the Number of Vehicles

The figure of 22,050 “commercial and other” parking spaces was slightly lower than we had expected to find. This is because not all spaces are occupied on a given day, and some are used for casual/ short-stay purposes. The two sources below suggest that there are up to 22,000-24,000 vehicles that are likely to be driven into the CBD and use long-stay parking each day:

- Our analysis of census data suggests that the number of CBD workers who drove to work on census day 2001 was 22,551, with 22,350 drivers in 2006, and 24,030 in 2013.⁵ These numbers are unscaled and don’t account for people who were ‘not elsewhere included’ on this question, or those who couldn’t be matched to a workplace location.
- Cordon survey data shows a declining number of private vehicles entering the CBD over 2000-2019. They suggest that roughly 23,000 cars enter the CBD each morning between 7 am and 9 am (there are also smaller numbers of taxis, vans, motorbikes, light trucks and heavy trucks, many of which would not be using car parking or would only be using on-street/ loading zone parks). However, some cars and other vehicles will be ‘through traffic’ e.g. Ubers and people travelling to schools or employment hubs outside the CBD.

These three different data sources all measure different things:

- The census data tells us how many workers drive to a workplace in the CBD (although not where they parked, i.e. they may park outside the CBD).

⁵ The 2018 census figure was 24,699 drivers, but this is not comparable to previous years: it asked respondents how they usually travel to work, not how (and whether) they travelled to work on one particular day. On any given day, some people won’t have gone to work. There were also data quality issues with the 2018 census.

- The cordon survey data tells us how many vehicles drive into the CBD between 7 am and 9 am (although it doesn't tell us what purpose the vehicles were used for, or how many enter during other times of the day, or whether vehicles parked or made a through trip or a 'drop off').
- The RID tells us the number of off-street parking spaces and their most likely use, but we can't completely distinguish between 'commuter' and casual/ shopper/ visitor parking. We don't know how many spaces are set aside for these short-stay purposes, but we do know that it is rare for carparks to reach 100% occupancy.

Overall, the 'quantity supplied' and the 'quantity demanded' of parking spaces seem to be fairly well matched at present. Unlike in some overseas cities, there is no major oversupply evident, and most carparks are likely to run at high occupancy levels.

5.7 The Wellington CBD Parking Market

Prices by Area and Over Time

Our review of carpark pricing in the Wellington CBD indicates:

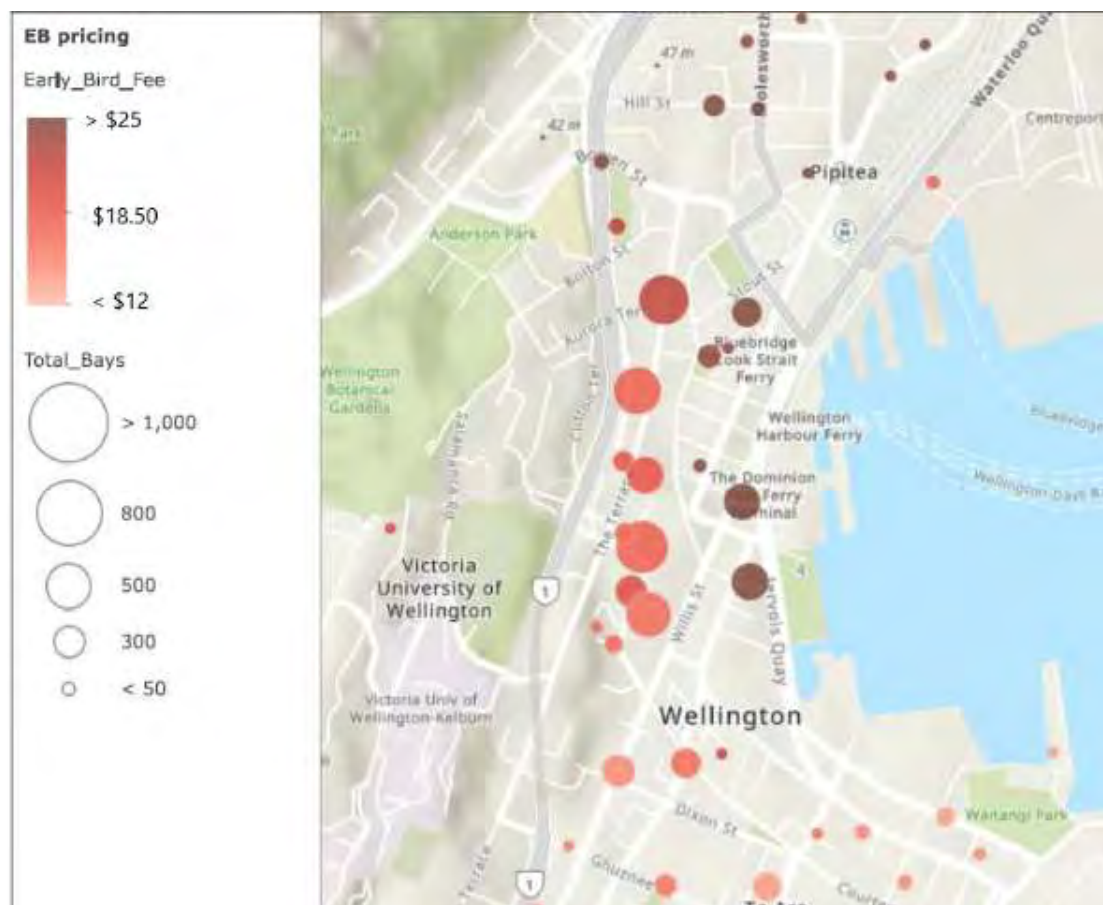
- On the 'supply' side, most costs are fixed in the short term. The largest cost is rent, with other costs including security, lighting, maintenance, enforcement etc. On a particular day, public carparks can simply focus on maximising revenue. In the long term which is our focus, there is no economic distinction between fixed and variable costs (i.e. long run marginal cost is equivalent to long run average cost).
- The majority of 'commercial and other' carparks in the CBD are private and leased on a long-term basis. Rents vary, but pre-Covid they were typically \$100-\$115 (plus GST) a week in the high-price areas, equivalent to \$23-\$26 (including GST) per workday. The cheapest leased carparks, in the more remote parts of Te Aro, might be around half this price.
- The vast majority of public carparks are likely to be used as earlybird/ commuter parking. Prices range from \$10-\$30 a day. For our financial model, we have grouped carparks into high-price and low-price areas, and (weighted by the number of spaces in each) used a weighted average of \$21 in high-priced areas (the central and northern CBD) and \$14 in low-priced areas (Te Aro and the stadium).
- Casual parkers pay a much higher price per hour, ranging from \$3 to \$12 per hour.
- Since parking operators simply want to maximise revenue on a given day, they should set their prices, so their expected revenue is the same whether the park is used by commuters or casual parkers. This implies that, on average, casual parks are used for 2-4 hours a day depending on the carpark.
- In simple terms, an operator is indifferent between an earlybird commuter paying \$15, or several casual parkers paying \$5 an hour who pay \$15 in total.
- Monthly parking is also a factor (whether by individuals who pay for their parks on a monthly basis, or by businesses who lease parks on a longer term), but we believe this can be considered as part of 'commuter parking' for our purposes.
- Casual parkers are likely to be less price-sensitive, i.e. casual demand is less elastic. This suggests that a 'flat' levy charge could mean casual prices increase more than commuter prices. However, our focus is on behaviour change in which case commuters could still be incentivised to change

mode. This analysis doesn't though rule out that there will be some shift between parks for commuters and casual parkers.

- The different price structures can be thought of as a form of price discrimination and exploit the fact that casual parking demand is only present for a few hours a day (10 am – 2 pm are the busiest hours) whereas commuter parking demand starts earlier in the day. To ensure that they can charge casual parkers a higher hourly rate, most Wellington carparks require that commuters arrive before 10 am (or 9:30 am in some carparks) to get the earlybird price.
- Unreserved monthly parking guarantees people a park somewhere in the building. For full-time workers in Wellington, it costs about the same as getting early bird every day, i.e. the monthly price is usually close to 20 times the earlybird price. This implies again that Wellington carparks run at high occupancy, since a revenue-maximising operator would offer monthly discounts if they could only expect to fill the spaces for 3-4 days a week. Indeed, as noted below, this has happened in Auckland and Christchurch post-Covid and may have occurred in Wellington to a limited extent.
- Reserved monthly parking is the parking equivalent of 'first class'. In public carparks, this can mean paying \$600 a month rather than \$300 a month, to receive a dedicated space which will be one of the easiest to get in and out of, normally on the floors closest to ground level (or to lifts). Private carparks (in office buildings, etc) are often quite small, in part so they can focus on this higher-value market of tenants within their building.
- For simplicity, we treat parkers as consisting of just two groups: 'commuters' and 'casual' parkers, with both groups effectively competing for the same spaces during the weekday. Since commuters pay similar prices whether they are earlybird or monthly parkers, we ignore the distinction between these payment methods – although there could be behavioural differences i.e. earlybird parkers may be more likely to change mode, at least on some days each week.
- Parking also occurs at night and in the weekends, but since occupancy, charges and demand are all much lower, we can ignore this for the most part.
- We simplify our financial model (and most of our economic discussion) further by focusing only on commuters. Any spaces not used by commuters – or those 'freed up' by a well-designed levy – are assumed to be available for casual parkers.

Figure 5.5 below compares earlybird pricing across the CBD, with lower prices evident in Te Aro (pale pink), medium-high prices along The Terrace and the highest prices around the waterfront and up through Pipitea:

Figure 5.5: Public Carpark Pricing by Area



Economists define demand (or supply) shocks as sudden, unexpected changes to demand (or supply) patterns.

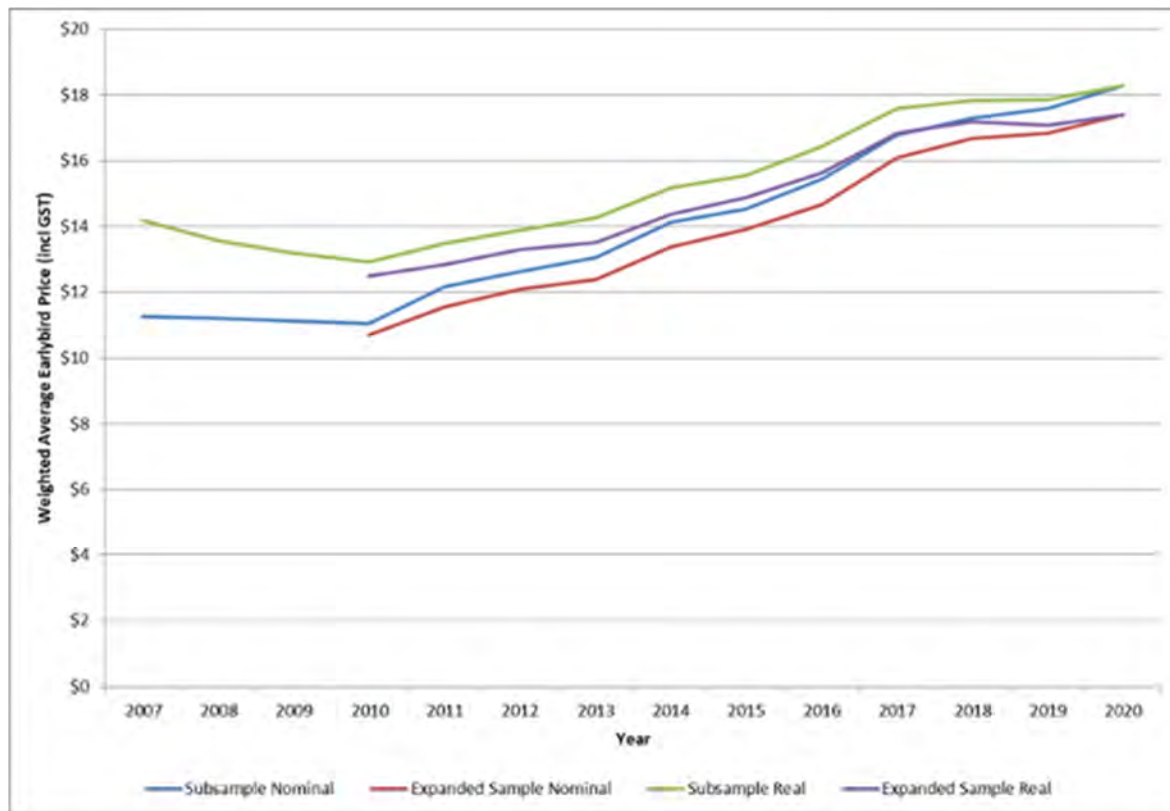
The 2016 earthquakes served as both a demand and a supply shock in Wellington. **Section 5.5** discussed the effects on parking supply. Demand was also affected: large-scale reshufflings of staff and tenancies occurred, and CBD office space has been highly sought after ever since. Several significant office buildings were damaged and demolished after the quakes, with others taking years to repair. For many Wellingtonians, this was their introduction to working from home.

Covid-19 has been a demand shock. Earlybird and casual prices in Wellington seem to have changed very little – in some carpark, they may have dropped briefly. However, it appears that monthly prices dropped more, and (anecdotally) operators have put more effort into promoting their monthly offerings. The advertised prices of monthly parking on the Wilson Parking website haven't changed much, but prices in their or others' carpark may be negotiable. These supply-side responses are not surprising and are consistent with parkers' willingness-to-pay remaining constant (since driving often remained the fastest or most convenient option) but the number of parkers dropping off. To maximise their revenue in this new environment, operators kept daily prices high, as the number of parkers would have been low even if they had dropped prices. In Auckland and Christchurch, there seems to have been more excess capacity, and Wilson actually went to the extent of offering discounted monthly pricing via GrabOne.

We have analysed weekday price trends in Wellington over time, with our 'subsample' of data that goes back to 2007 covering 14 public carpark (with 3,487 spaces or 35% of the total) and our 'expanded

sample' that goes back to 2010 covering 31 carparks (with 6,870 spaces or 68% of the total). Our findings are shown in **Figure 5.6** below:

Figure 5.6: Public Carpark Pricing Over Time



Prices were effectively flat in nominal terms over 2007-10 (declining in real terms compared with Consumers Price Index movements). Since 2010, they have increased more steadily, by 63% nominal or 39% real over 2010-20. We would expect that the 2016 earthquakes might have pushed prices up, but we cannot be certain of this as we had to interpolate data for some years around the time of the earthquake.

The trends for casual hourly prices were similar, with a nominal increase of around 60% in the last 10 years.

5.8 Conclusions

Our parking inventory is based on WCC’s Rating Information Database. This provides crucial information such as the number of carparks for each property (or component), what the property is used for, and whether the owner is a public or not-for-profit organisation. This data is important for determining which carparks would be subject to a levy.

We have carried out several data validation exercises on the database, which confirmed that it was an excellent starting point for our work but that there were some errors or omissions. We have made corrections where possible.

The parking inventory indicates:

- 27,660 parking spaces in the CBD comprised of 4,329 residential, 1,281 retail and 22,050 ‘commercial and other’ spaces. This third category is the focus of the Parking Levy.

- Of the 22,050 'commercial and other' spaces, 19,575 are part of a property that has 11+ spaces. This figure is conservative, as some carparks are individually titled but owned by the same company/ organisation.
- 2,153 spaces are owned by public/ not-for-profit entities that have a 100% or 50% rates exemption. However, the majority of these are used as paid public parking.
- 10,094 spaces are included in our public parking database, which is a subset of the overall parking inventory (but which has different data sources).
- Some carparks have switched from 'public' to 'private' and vice versa.
- The 2016 earthquakes led to the removal of at least 2,000 public parking spaces. The number of private spaces has probably risen over time, due to new buildings being developed.

We have also collected current pricing information for Wellington carparks and created a historical price trend series for public carparks over 2007-2020.

As a comparison to the estimated 22,050 'commercial and other' parking spaces, we have looked at 2013 census data which suggests that 22,551 CBD workers drove to work on census day; and at cordon survey data which suggests that 23,000 cars enter the CBD each morning between 7 am and 9 am.

These data sources all measure different things, but they indicate that the 'quantity supplied' and the 'quantity demanded' of parking spaces seem to be fairly well matched at present. There is no obvious oversupply, although it is possible that there was one in Te Aro before the 2016 earthquakes.

6.0 WELLINGTON COMMUTER PARKING LEVY DESCRIPTION AND OPTIONS APPRAISAL

6.1 Introduction

Sections 6.2 to 6.22 provide a description and review of the proposed Wellington Commuter Parking Levy whilst Sections 6.23 to 6.25 summarise the options that were considered and why these options were rejected. The Parking Levy Study had a clearly defined scope. Ministerial political direction meant that consideration of alternative (to a Parking Levy) demand management approaches or solutions to the defined problem were out of scope for the Parking Levy study. Furthermore, the RFP for the Parking Levy study was prescriptive in terms of:

- The boundary of the study being the Wellington CBD.
- Parking levy would apply to commuters only.
- Parking Levy would apply to off street car parks in the CBD only.

6.2 Project Title

We have called the project the **Wellington Commuter Parking Levy (WCPL)**. We have used this name in order to clearly describe the Levy and therefore at the outset it is obvious that the Levy does not apply to residential parking or any non-employment related short stay parking. The RFP stated that this is a levy for commuter parking and the objective is to reduce AM peak vehicle trips to the CBD. The Nottingham scheme title is the Nottingham Workplace Parking Levy, which again makes it clear at the outset what the levy is about. The naming of the Australian schemes, for example the Parking Space Levy (Sydney) and the Congestion Levy (Melbourne) are not considered to reflect what these schemes are actually targeted at.

6.3 Leviale Parking Space Definitions

Under the Wellington Commuter Parking Levy, it is proposed that all long-stay (commuter) parking spaces in the CBD will be leviale. A leviale long-stay (commuter) parking space is defined below under the following two types with options considered for their implementation outlined:

6.4 Type 1 – Private (Employer) Off street Car Parks

Option A

The proposed Parking Levy applies to all property owners/occupiers in the CBD who have private off-street parking spaces (ie that are not available for use by the general public) and are occupied by a motor vehicle used by an:

- Employee.
- Student.
- Regular Business Visitor (eg a consultant, contractor, supplier, agency staff, tradie or other business visitor attending a regular place of work which is any premises that a regular business visitor is parked at and attends on three or more days over a 14-day period).

The proposed Levy is a charge made on the total number of leviable parking places provided by a property owner/occupier at any one time.

Option A is essentially a bottom-up approach where you start with 0% of private car park spaces are leviable, and then you build up to include the employment related leviable spaces.

In the situation where an employer provided car park is situated in a public building, these car parks would be categorised as a "Type 1" car park with the property owner/occupier liable to pay the Levy for these spaces.

This description is similar to that used in the Nottingham Parking Levy. A potential issue with this description is that although the categories above are sufficiently broad, they may give 'wriggle' room or allow owners/occupiers to claim that they don't fall into those categories, meaning extra administration time for the levying authority to check whether they are correct. Also, visitor parking could be easily abused, ie who is checking if someone is "regular"? However, Nottingham have confirmed that their Parking Levy compliance and enforcement team manage this and have not had any difficulties with this.

Option B

It is proposed that all private spaces are leviable unless covered by one of the exemptions below:

- Residential parking.
- Customer parking at commercial non employer related locations eg retail, restaurants, theatres, clubs, bars, funeral parlours, car showrooms, medical centres etc - others would need to be added to this list as required.
- Guest parking at hotels.

Option B is a top-down approach, where you start at 100% of private car park spaces are leviable and then you exempt down.

Option B includes all private parking spaces in the CBD, so in addition to the exemptions (applicable to both Options A or B and listed below), additional exemptions to cover all non-employment related private parking would need to be included in Option B.

The Australian schemes are based on this approach, since these schemes include short stay and on street parking.

Option B could make the exemption list rather long and potentially open to interpretation and difficult to manage. Education would not be exempt to ensure students are liable. How regular business visitors (eg contract workers, tradies etc) are captured would need to be identified. Option B does not necessarily tie in with the description of the Parking Levy being a Commuter Parking Levy since, at the outset, it infers all private parking spaces are leviable.

Type 1 exemptions (ie do not need to be licensed)

Based on experience from Nottingham, the more exemptions there are, the more administratively difficult it is to manage the scheme and the more open to interpretation to avoid payment. Therefore, the number of exemptions has been purposefully kept to a minimum.

It is proposed that a parking space may be exempt if it is either:

- Owned by a specific class of owner; and/or
- Used for a particular purpose.

For **Type 1** the following is proposed to be exempt:

- Locations where there are 10 or less parking spaces in total – the rationale for this exemption is that experience from the existing international parking levy schemes indicates that where parking numbers are small then the administration costs are relatively high compared to the revenue raised and behaviour change is unlikely to be much different with these small number of spaces. The existing parking levy schemes have different cut off criteria (eg Perth uses a cut off of 5 or less and Nottingham uses a cut off of 10 or less). 10 or less is proposed as an exemption for the Wellington Parking Levy since, as detailed in **Figure 5.3**, the vast majority of off-street carparks have 11 carparks or more (19,575 carparks out of the total 22,050 = 89%) and this only increases marginally to 20,416 out of the total 22,050 (92%) with 6 or more carparks. In the Nottingham scheme there is still a requirement for these spaces to be licensed but they are then given a 100% discount from the charge – this ensures that all workplace parking is licensed, provides a comprehensive database on all premises and importantly the discount only applies if you provide 10 or less spaces in total in the whole Parking Levy boundary. Therefore, associated premises in the Parking Levy boundary may each provide 10 or less but together in total if they provide more than they are all charged for. Since discounts are not proposed as part of the Wellington Parking Levy scheme, it is not proposed to license all spaces.
- Emergency services vehicles.
- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for customers (the exemption does not apply if the person providing the parking space charges customers a fee for parking in the space).
- Parking spaces allocated for loading/unloading.
- Parking spaces allocated for cycles
- Parking spaces allocated for and motorcycles (although noting this could result in a modal shift from car to Motorcycle and a resultant increase in on street motorcycle parking demand).

Other exemptions which could be considered include:

- Parking spaces allocated for fleet vehicle parking (fleet vehicles do not include vehicles which are assigned to individuals as their personal vehicles or are usually taken offsite outside of business hours). Note this could be open to interpretation– the Census suggests 2,700-3,000 (11%-12% of total) of CBD car commuters drive a company car (the Parking Levy Stated Preference figure was 10%). The danger with this exemption is that companies could be given some ‘wriggle’ room with this exemption. A good communications campaign that includes this aspect would be recommended. For the Nottingham Parking Levy this is an area dealt with by the Compliance Team and has not been problematic in Nottingham.
- Car parks used by central government agencies which are required for operational reasons - for example, spaces used by agencies such as Customs or MPI. The scale of operational vehicles parked in the CBD by Government agencies is unknown and would need to be discussed with the agencies as part of the development of the Parking Levy.
- Exempt spaces at buildings that are not leased – given the potential impact of Covid on building occupancies and hence leases, this may be a consideration.

Parking spaces associated with Crown Land. There are a number of Crown Land properties in the CBD including the Parliamentary Precinct, Government House, land managed by departments and Crown entities including NZTA (eg Clifton Terrace/car park), Ministry of Education (eg Wellington Girls College, Thorndon Primary, Mt Cook Primary), Australian High Commission on Hobson Street and part of Egmont Street. In New Zealand income tax is generally considered as being imposed on an entity (for example an individual, or a company) rather than on land itself. Therefore, for income tax purposes the Executive Government of New Zealand (the Crown) is exempt from income tax under section CW 38 of the Income Tax Act 2007. However, some public entities such as state-owned enterprises are not exempt from tax under this provision. So rather than the land itself being exempt from tax, any income derived by the Crown (whether upon disposal of the land, or from rent payments if it is leased) would not be subject to income tax. Therefore, whether Crown land (or certain aspects of it) should be exempted under a Parking

Levy Act would be a question of the design of that Act and not a question of the land-owning entity's income tax exemption (which would be a separate matter). This would need to be discussed with the Government of the day based on, for example, practical or political reasons to determine which areas of Crown land should be subject to the Parking Levy.

- Embassies and High Commissions – the scope to enforce the Levy on foreign owned embassy and High Commission land will need to be reviewed.
- Parking spaces provided by registered charities regardless of whether the person providing the parking space charges a fee for parking in the space. Commuter trips associated with charities contribute towards congestion so they should be liable but there could be ethical reasons why they are exempt.

Exemptions considered but rejected include:

- Carpool spaces have not been exempted since this would be difficult to administer.
- Electric vehicles have not been exempted since although they will reduce Carbon emissions they are contributing to congestion. Also this would be difficult to administer.
- Include all locations regardless of the number parking spaces – Nottingham City Council have advised that this would increase administration costs to include every single private employer off street car park space below a threshold of say 10 or more spaces. However the Sydney Parking Levy does not have a threshold number and charges all spaces.

Who is responsible for paying the Levy?

Responsibility to pay the Levy differs between the existing 4 international Parking Levy projects as follows:

- Nottingham - Obligation to licence spaces and pay lies with the "charge payer" – that being the occupier(s) of the premises at which the workplace parking is provided (WPL Order, paras 1(3) and 3(2)).
- Melbourne - The owner of premises containing leviable parking spaces is liable to pay (CLA, section 9).
- Perth - The owner of parking bays within the Management Area must apply for a licence and is charged the relevant amount (if any).
- Sydney - The owner of leviable premises (which is defined to include a lessee or licensee thereof) is liable for payment. If the premises are jointly owned, the owners are jointly and severally liable (PSLA, section 8).

As reported in the Survey Report (**Appendix 2.2**), based on the external stakeholder consultations carried out, the vast majority of leases in Wellington are Gross ie rates and insurance are borne by the property owner and are not part of a tenant's lease. Therefore, if the Levy is introduced and property owners are responsible to pay, then the levy is unlikely to be passed onto the occupier and hence ultimately not to the driver and therefore not achieving mode shift. Furthermore, owners are not responsible for decisions on the management of parking spaces, specifically the number used for commuting. Together, this means charging the Parking Levy to owners, rather than occupiers, would (other things being equal) be likely to generate more revenue but be less effective at reducing congestion. On the other hand, charging the Parking Levy to owners could serve to reduce administration costs. Hence, we see the question of charging owners as opposed to occupiers is one of the relative benefits of lower administration costs versus the achieving the objective of modal shift by reducing the amount of AM peak commuters driving and parking in the CBD.

In terms of being able to establish who the occupiers are, the Nottingham Parking Levy scheme used a variety of data sources including Companies House, business rates and via site car park audits. It is suggested that similar sources are used for the Wellington Commuter Parking Levy and the scope to oblige

building owners and property managers, within the legislation, to provide details of occupiers, could also be considered.

Therefore, for the Wellington Commuter Parking Levy Type 1 category it is proposed that the occupier of the premises will be responsible for paying the Levy.

Preferred Type 1 description

Option A is preferred since this will lead to the least number of exemptions required and therefore the proposed Type 1 description is as follows:

The Parking Levy applies to all occupier(s) of premises where private off-street parking spaces (ie that are not available for use by the general public) are occupied by a motor vehicle used by an:

- Employee.
- Regular Business Visitor (eg a consultant, contractor, supplier, agency staff, tradie or other business visitor attending a regular place of work which is any premises that a regular business visitor is parked at and attends on three or more days over a 14-day period).
- Student.

The Levy is a charge made on the total number of leviable parking places provided by an occupier at any one time.

For **Type 1** the following are proposed to be exempt:

- Locations where there are 10 or less parking spaces in total.
- Emergency services vehicles.
- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for customers (the exemption does not apply if the person providing the parking space charges customers a fee for parking in the space).
- Parking spaces allocated for loading/unloading.
- Parking spaces allocated for cycles and motorcycles.

6.5 Type 2 – Public Off Street Car Parks

Option A

It is proposed that the Parking Levy applies to all parking spaces at off street public car parks (ie car parks in which the predominant number of parking spaces are set aside for, or used by, the general public, whether on a casual basis or under any kind of longer-term arrangement) which are:

- Used for the parking of a motor vehicle for a period of at least 4 hours on a working day, commencing at or before 1000 (Parking Levy survey indicated that 96% of commuters arrive before 1000).
- Set aside or used for ongoing parking by the owner of the space (or another person under lease or license).

With this option any vehicles arriving before 1000 and staying longer than 4 hours are liable – this could though capture non commuters (eg residents who lease a public car park space and people staying overnight in a hotel and arriving at the car park after midnight).

Records would need to be maintained by the owner/operator on a daily basis detailing the number of spaces occupied by 1000 and whether these have parked for 4 hours or more in the day. Records of leases/permits etc would also need to be provided.

Option B – it is proposed:

- All public car park spaces are leviable, with an exemption being made of casual car park spaces that are not used by commuters on a working day. Whether or not a casual parking space has been used on a particular working day by a commuter is defined as any casual parking space unused at 1000 on a working day (Parking Levy survey indicated that 96% of commuters arrive before 1000).
- Where a parking space set aside for the parking of a motor vehicle under an arrangement (usually, a lease or license) which gives a person the use of it to the exclusion of any other parker (a reserved parking space) is not defined as a casual parking space.

Option B is based on the Sydney scheme (which uses 1pm as the time of maximum daily usage since the Sydney scheme is not just aimed at long stay commuters).

Records would need to be maintained by the owner/operator on a daily basis detailing both the number of spaces available (both casual and reserved) and the number of unused casual car park spaces on a weekday at 1000. Evidence from the Sydney scheme has indicated that the administration costs associated with daily record keeping is minimal, as the operators already collect the records for business purposes.

Option B allows car park owners/operators more flexibility in their strategy – they can lower prices and fill more parks but pay more levies, or they can raise prices and fill fewer parks but pay less in the levy, or close some parks off in holiday periods etc. This could be a really important tool for behaviour change. Treatment of residents who lease a parking space in a public car park will need to be considered.

Other Type 2 Options considered but rejected.

- In the Nottingham scheme, if an employer has contracted parking for its employees at a public car park then the employer is liable and is captured. This is explained both to the employer and then also through communication directly with the public car park operators. The Nottingham scheme though does not capture employee paid parking in public car parks since it is aimed at employers only. Therefore, the approach outlined in Type 2 is the preferred option.

Type 2 exemptions proposed (ie do not need to be licensed)

A parking space may be exempt if it is either:

- Owned by a specific class of owner; and/or
- Used for a particular purpose.

For Type 2 the following are exempt:

- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for cycles
- Parking spaces allocated for motorcycles. (although noting this could result in a modal shift from car to Motorcycle and a resultant increase in on and off-street motorcycle parking demand).

An option to exempt parking spaces allocated for car share (eg Mevo and Cityhop) was considered but rejected because currently there are no spaces allocated in any CBD off street public car park for these schemes. This could be reviewed in the future if the car share schemes move into a public car park.

An option to exempt parking spaces leased by CBD residents in a public car park was considered but rejected since this would be difficult to administer and controls would then need to be put in place to prevent residents then leasing the parking space to a commuter. The Melbourne scheme addresses this by including residents who lease a parking space to a commuter (see **Section 6.6** below).

Who is responsible for paying the Levy?

In the three Australian schemes, where the Levy applies to public car parks, the responsibility to pay the Levy is as follows:

- Melbourne - The owner of premises containing leviable parking spaces is liable to pay (CLA, section 9).
- Perth - The owner of parking bays within the Management Area must apply for a licence and is charged the relevant amount (if any).
- Sydney - The owner of leviable premises (which is defined to include a lessee or licensee thereof) is liable for payment. If the premises are jointly owned, the owners are jointly and severally liable (PSLA, section 8).

As reported in the Survey Report (**Appendix 2.2**), based on the external stakeholder consultations carried out, the vast majority of leases in Wellington are Gross ie rates and insurance are borne by the property owner and are not part of a tenant's lease. Therefore, if the Levy is introduced and property owners are responsible to pay, then the levy is unlikely to be passed onto the operator and hence ultimately not to the driver and therefore not achieving mode shift.

For the Wellington Commuter Parking Levy Type 2, it is proposed that the operator of the premises will be responsible for paying the Levy.

Proposed Type 2 description

It is considered that Option B is the easiest to administer and therefore the proposed Type 2 description is as follows:

- All public car park spaces are leviable, with an exemption being made of casual car park spaces that are not used by commuters on a working day. Whether or not a casual parking space has been used on a particular working day by a commuter is defined as any casual parking space unused at 1000 on a working day.
- Where a parking space set aside for the parking of a motor vehicle under an arrangement (usually, a lease or license) which gives a person the use of it to the exclusion of any other parker (a reserved parking space) is not defined as a casual parking space.

The following are exempt:

- Parking spaces allocated for Mobility Parking permits.
- Parking spaces allocated for cycles or motorcycles.

6.6 Other Parking Types considered

CBD residents parking

All of the existing international Parking Levy schemes exempt residents parking. For the Wellington Commuter Parking Levy, CBD residents parking spaces will be exempt primarily because CBD residents are not contributing to the number of cars driving in and parking in the CBD in the AM peak.

CBD Residential Parking leased to a commuter.

Although residential parking spaces within the CBD would be exempt from the Levy, an option that this exemption does not apply if a resident leases their parking space to a daily commuter who commutes to the CBD or for another non-residential purpose was considered. In this case, regardless of whether the space is owned or leased, the owner or tenant of the residential parking space would be liable to pay the levy.

This is an evolving landscape, and as indicated in **Section 5.3**, our research indicates that this does currently happen on a reasonable scale in Wellington. There are over 4,000 residential car parks in the CBD, and the main platform used is TradeMe (20+ listings at present) and others including SharedSpace and AnySpace. Apps like Parkable are not yet prevalent in Wellington but are likely to become more common in future. Depending on the levy design, residents could lease out their carparks, especially if they can avoid paying the levy and therefore undercut the competition. This creates perverse incentives, potentially more commuter driving, and encourages new apartment buildings to be built with more parking to facilitate this. In Melbourne, residents become liable for the levy if they rent their spaces out to non-residents, including via park-sharing websites. The levy payment could be implemented with assistance from the trading platform/app used, for example they would only be able to advertise the space once evidence is shown that the levy has been paid on the space.

At this stage we have not included CBD resident spaces leased to commuters in the Parking Levy because:

- The numbers involved per owner/tenant will be lower than the 10 or less spaces threshold proposed for Type 1 private parking.
- It is not clear whether this is a large enough problem worthy of the increased administrative costs.

We do though recommend that this is considered and monitored in more detail in the future should LGWM view this is a potential problem and if it is considered that residential car parking arbitrage may be a future issue.

CBD residents who lease a parking space in a public car park

As reported in the Survey Report (**Appendix 2.2**), there are CBD residents who lease a parking space at public car parks - for example there are circa 50 residents from the Soho Apartments who lease a parking space at the Hope Gibbons public car park on Taranaki Street. The numbers involved is unknown and providing exemptions for these leases could be difficult to administer and would require the car park operator to demonstrate the address of the person leasing the space (to establish they are a CBD resident) and specify a vehicle whose registration is to a CBD residence (to avoid residents leasing a space and then sub leasing this to a commuter). At this stage we have not included this as exemption since the numbers involved is unknown and it could be difficult to administer. However, it could be considered further as part of any future work on the Parking Levy.

6.7 Discounts

The Nottingham scheme includes a number of discounts eg to hospitals. No such discounts are proposed for the Wellington scheme in order to keep the Levy as easier to administer as possible.

6.8 Parking Space Definition

It is proposed that a parking space is an area used or set aside for parking a vehicle, including areas not marked by parking lines. Where an area is used or set aside for parking but does not have defined parking spaces marked, each 20.4m² is considered a parking space (calculated using the Australian/New Zealand Standard AS/NZS 2890.1:2004 minimum requirements for the design and layout of off-street parking facilities). A parking space continues to exist notwithstanding that a sign or temporary barrier indicates the parking space is not a parking space.

Options considered.

- The Nottingham scheme doesn't define a liable parking space in terms of size as it is described as any motor vehicle parked on the employer's premise (which includes any land or building. i.e. inside, outside, grass verges, double parking etc) that is used by an employee, regular business visitor or pupil or student. Therefore, vehicles can be parked anywhere on site on an employer's premise and still be liable ie grass verges, loading bays, double parked etc. This could be difficult to administer and, in the Wellington CBD, it is considered that the majority of private car park spaces will be marked out.

- The Melbourne scheme uses a value of 25.2m² and the Sydney scheme uses 18m².
- The Sydney scheme also makes provision for car stackers – no employee related car stackers exist in Wellington CBD.

6.9 Variable Charges by area

Options were considered of applying the Levy at the same cost across the whole of the CBD or applying differing rates in different areas of the CBD. The Nottingham scheme has a flat rate across all areas of the city whilst the Melbourne and Sydney Schemes apply a lower rate to areas outside of the CBD. Within Wellington CBD, parking costs in Te Aro are lower, but more importantly driving mode share is higher, even though workers there are on lower incomes. Te Aro is further from the train station as well and hence public transport access is not currently as good as the rest of the CBD. Therefore, as detailed in **Section 7**, a lower Parking Levy in Te Aro is proposed.

6.10 Incremental Charges

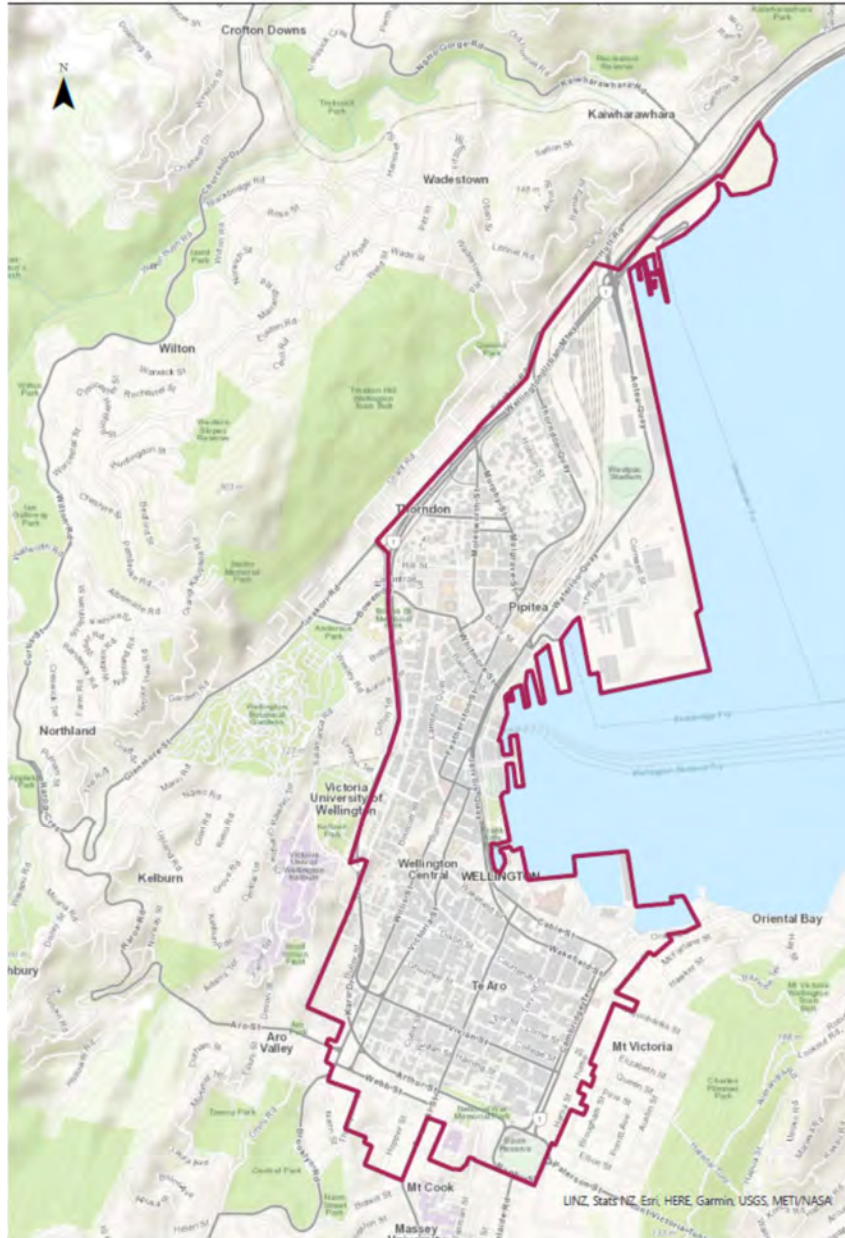
In terms of introducing the Parking Levy, we have considered whether the full charge is made in year 1 (with resultant inflationary increases thereafter) or whether it is introduced in year 1 at a lower rate and then incrementally increased for example over 3 years to its intended rate (which is how the Nottingham scheme was introduced). As detailed in **Section 7** it is considered that an incremental price increase over 3 years is preferable since this will allow car park operators time to adapt to the Levy (eg through monitoring of car park usage, collating data on for example leases and also to understand how their own pricing mechanisms needed to change). This will also allow occupiers of private car parks to review their employment agreements and travel policies. This will also allow timing of complementary public transport and active mode improvements to be introduced, gives employees time to adapt or change their behaviour before the full charge is in place, as well as likely being more politically and publicly acceptable.

There will be a delay in realising reductions in car mode share. Australian studies showed where there was a gradual increase in the levy the impact on travel mode was not as great compared to when there was a significant increase in the levy.

6.11 Definition of the CBD and the Parking Levy Boundary and options considered.

There are currently various alternative definitions of the CBD used by LGWM partners. The proposed CBD definition which will be used as the Parking Levy Boundary is the WCC downtown targeted rate boundary (see **Figure 6.1** below) - we consider that this is the best description of the CBD and also is the boundary that businesses will be familiar with.

Figure 6.1 – Parking Levy Boundary



If after implementation and the impacts and displacement indicate the scheme area needs to be expanded then this could be considered.

Other options we considered included:

- WCC Parking Policy definition - (see **Dwg No 3-102**). The boundary defined in the WCC Parking Policy excludes the Sky Stadium area and part of the Mount Cook area.
- WTSM – (see **Dwg No 3-103**). The Wellington Transport Strategic Model (WTSM) that is managed by GWRC does not include the Thorndon/Sky Stadium area and includes a large area of Mount Victoria within its definition of the CBD boundary.
- Stats NZ 2018 Census Statistical Area 2 (SA2) - (see **Dwg No 3-104**), SA2 boundaries are defined for statistical purposes and includes areas north of the CBD eg Hutt Road and Kaiwharawhara Road.

- Stats NZ 2013 Census Area Units (CAU) - (see **Dwg No 3-105**), superseded by SA2 and CAU includes areas north of the CBD eg Tinakori Road.
- WCC Operative District Plan – (see **Dwg No 3-106**), excludes parts of Thorndon.
- GWRC Cordon Survey (see **Dwg No 3-107**), boundary based on the cordon points includes parts of Kelburn and excludes parts of Thorndon.
- On the WCC website, the WCC parking team have a different definition of the CBD (to that used in the WCC Parking Policy) for the Coupon parking area boundary, which is shown on **Dwg No 3-108**. It should be noted that the WCC Coupon area plan incorrectly does not show the existing Coupon parking area on Bowen Street (see location 18 on **Dwg No 3-100**). Due to the clearway on this section of road, the operating times of this coupon parking area are different to that indicated for all coupon areas on the WCC website (see **section 6.13** below).
- Metlink fare zone 1 – which covers a wider area eg south and west of the basin.
- Wellington City Council’s Rating Information Database uses a definition of the CBD that includes a wider area of Thorndon on the west side of State Highway 1 and a suburb-based definition, which bounded the CBD as within four suburbs: Pipitea, Thorndon, Wellington Central, and Te Aro.

An assessment of the various CBD definitions and our recommended option is included in **Table 6.1** below:

Table 6.1 CBD/Parking Levy Boundary options

Definition	Coverage	Pros and Cons	Recommended?
WCC Downtown Targeted Rate	CBD	<ul style="list-style-type: none"> • Well understood boundary by the business community • Includes most areas that individuals would generally think of as ‘the CBD’. • Covers most major car parking locations north of the CBD used by commuters, such as the Stadium Car Park 	Yes
WCC Parking Policy	Excludes almost all of Thorndon, both west of State Highway 1 and north of Murphy Street ⁶	<ul style="list-style-type: none"> • Exclusion of Thorndon would likely be problematic due to adjacency and common commute pathways. • Excludes the Stadium parking area north of the CBD 	No
WTSM Definition of the CBD	Excludes most of Thorndon west of State Highway 1 and includes parts of Mount Victoria	<ul style="list-style-type: none"> • Exclusion of Thorndon would likely be problematic due to adjacency and common commute pathways. • Would exclude most of the Stadium parking area as well. • Mount Victoria is not CBD 	No
2018 Census SA2’s	Includes areas north of the CBD eg Hutt Road and Kaiwharawhara Road.	<ul style="list-style-type: none"> • Some of these areas are not considered to be CBD. 	No

⁶ A map of how the CBD according to WCC’s Parking Services Team is defined relative to coupon parking zones is available here: https://wellington.govt.nz/-/media/services/parking-and-roads/parking/files/2019/coupon_parking_zone.pdf?la=en&hash=0DDC61275AEEB70200490C88548F4D1BCB9CBE40

2013 CAU's	Includes areas north of the CBD eg Tinakori Road	<ul style="list-style-type: none"> Some of these areas are not considered to be CBD. 	No
WCC Operative District Plan	Excludes parts of Thorndon	<ul style="list-style-type: none"> This is the closest option to the preferred boundary. Exclusion of Thorndon would likely be problematic due to adjacency and common commute pathways 	No
GWRC Cordon Survey	Includes parts of Kelburn and excludes parts of Thorndon	<ul style="list-style-type: none"> Exclusion of Thorndon would likely be problematic due to adjacency and common commute pathways. Would exclude most of the Stadium parking area as well. Kelburn is not considered to be CBD. 	No
WCC Coupon parking	Excludes parts of Thorndon and the CBD fringes.	<ul style="list-style-type: none"> Exclusion of Thorndon would likely be problematic due to adjacency and common commute pathways. Incorrectly does not show existing coupon parking on parts of Bowen Street. 	No
Metlink fare zone 1	Covers a wider area eg south and west of the basin	<ul style="list-style-type: none"> Includes areas which are not part of the CBD 	No
WCC Rating Information Database	Four suburbs are included within the CBD: Wellington Central, Te Aro, Thorndon, and Pipitea	<ul style="list-style-type: none"> Clear suburb-based delineation However, the dividing line between Thorndon and Kelburn is somewhat unclear in this approach, particularly up Tinakori Road towards Kelburn 	No

For purposes of consistency with how a Parking Levy may be implemented and given that the Downtown Targeted Rate area is a well-known definition to the business community within Wellington City and, in particular, the central business district, we suggest that the boundary defined by the downtown targeted rate is the most useful and closest approximation of individual and business' understanding of 'Central Wellington'/CBD.

6.12 Scope for the Parking Levy Boundary to be wider than the CBD boundary.

The RFP for the Parking Levy was prescriptive in terms of the boundary being the CBD (which ties into the objective of reducing vehicles driving into the CBD in the AM peak) and this is what the study has focussed on. The scope for having a wider than the CBD boundary has been questioned by the Parking Levy Team. One of the main findings from the Nottingham scheme was that the hospital was exempted from coverage associated with the levy; in hindsight, Nottingham City Council have indicated that this would not have been their preference now, as the hospital contributes to a substantial amount of commuter traffic and parking.

Outside of the CBD in Wellington, there are three main areas which may attract significant commuter traffic that passes into and through the CBD during the morning peak. These are:

- Wellington Regional Hospital, located on Adelaide Road, in Newtown, just to the south of the CBD boundary area.
- Massey University, primarily located on Wallace Street, in Mount Cook, again just to the south of the CBD boundary area.
- Te Herenga Waka / Victoria University of Wellington primarily located along Kelburn Parade, in Kelburn, just to the northwest of the CBD boundary area.

These could cover any spillover/displacement effects due to the CBD definition of the Parking Levy.

It is recommended that, as part of the next phase of work, LGWM consider analysing boundary areas outside of 'the CBD that may contain significant commuter demand and car-parking facilities, covering at least the above three locations (Wellington Hospital, Massey University, VUW).

It is worth noting that the Nottingham scheme is for the whole of the Nottingham City Council administrative area and the Sydney scheme had an amendment Act in 2000 to create two category areas. Similarly, Melbourne introduced a second category area in 2015.

6.13 Scope for the Parking Levy to include existing on street Coupon parking within CBD

The RFP for the Parking Levy was prescriptive in terms of the Levy only being applicable to off street car parks used by commuters. Within the proposed Parking Levy boundary there are circa 761 existing coupon car park locations, as shown on **Dwg No 3-100**. This is a lower than the circa 1250 indicated in Figure 10 of the WCC Parking Policy Review Background Information and Issues Report (dated 21/1/20) which uses a slightly different boundary definition for the CBD (see **Dwg Nos 3-102 and 108** and **Section 6.11** above).

Not all of these 761 spaces will be used by commuters, since short stay users can park for free for <2 hours in these spaces, a resident permit enables residents to park in both coupon and resident parking spaces within their zone and also residents can buy a coupon parking exemption permit to park in these spaces. However, there is limited data available on the profile of users of the coupon parking spaces and, as such, we don't know how many commuters are actually parking in coupon parking spaces. However, these spaces are in the CBD and are available to commuters and therefore it is considered appropriate to include these spaces as part of the Parking Levy because:

- Public perception of WCC: simultaneously levying private commuter car parking providers while exempting WCC controlled commuter car parking could be seen as unfair/hypocritical by the public and jeopardise the success of the Parking Levy scheme.
- It is at odds with the desired outcome of the Parking Levy: While it may represent a relatively small proportion of commuter parking in the CBD (circa 3.5%), including coupon parking in the Parking Levy scheme will contribute to the desired outcomes of the programme: discouraging car commuting to the CBD, raising revenue, and prioritising parking for short stay and residents use instead of commuter use.

We recommend that Wellington City Council consider the relative pricing and placement of coupon parking zones that fall within the Wellington Commuter Parking Levy boundary (as opposed to the Coupon parking spaces themselves being liable). This could include:

- Considering increasing the pricing of coupon parking by an attendant amount, in line with the introduction of a Commuter Parking Levy that covers off-street commuter car parking, or
- Including coupon parking zones within scope of the coverage of the levy, or,

- Reducing the number and amount of on-street, long-stay coupon parking zones within the commuter parking levy boundary area, either by transitioning these parking spaces wholly to on street resident's car parks, short-stay, or removing the spaces entirely, or,
- As part of the WCC Parking Policy we are aware of proposals for metered parking to change from a fixed 2-hour maximum to unlimited time (but with the hourly rate rising after the first couple of hours). If these coupon spaces are changed to metered then they are available to both short stay users and long stay users who would pay a premium.

This will be a key priority for the new parking policy to address this directly to complement the Parking Levy scheme.

6.14 Scope for the Parking Levy to include existing on street 10-hour maximum metered parking within CBD.

The RFP for the Parking Levy was prescriptive in terms of the Levy only being applicable to off street car parks used by commuters. Within the proposed Parking Levy boundary there are circa 132 existing 10-hour maximum car park locations, as shown on **Dwg No 3-101**. These spaces are included in the total of 3270 on street metered spaces quoted in the WCC Parking Policy Review Background Information and Issues Report (dated 21/1/20). All of these parking bays have a 10-hour maximum stay with a rate of \$2.50/hour effective between 0800 to 1800 on a weekday (to 2000 on a Friday).

Not all of these 132 spaces will be used by commuters since they can also be used by short stay users. However, there is limited data available on the profile of users of these parking spaces and, as such, we don't know how many commuters parking are in these 10 hour metered parking spaces. However, these spaces are in the CBD and are available to commuters and therefore it is considered appropriate to include these spaces as part of the Parking Levy because:

- Public perception of WCC: simultaneously levying private commuter car parking providers while exempting WCC controlled commuter car parking could be seen as unfair/hypocritical by the public and jeopardise the success of the Parking Levy scheme.
- It is at odds with the desired outcome of the Parking Levy: While it may represent a relatively small proportion of commuter parking in the CBD (circa 0.5%), including the metered 10-hour max parking in the Parking Levy scheme will contribute to the desired outcomes of the programme: discouraging car commuting to the CBD, raising revenue, and prioritising parking for short stay and residents use instead of commuter use.

We recommend that Wellington City Council consider the relative pricing and placement of the 10-hour maximum metered parking zones that fall within the Wellington Commuter Parking Levy boundary (as opposed to the 10 hour max metered parking spaces themselves being liable). This could include:

- Considering increasing the hourly rate by an attendant amount, in line with the introduction of a commuter Parking Levy that covers off-street commuter car parking. As part of the WCC Parking Policy we are also aware of proposals for metered parking to change from fixed maximum length of stays to unlimited time (but with the hourly rate rising after the first couple of hours) or,
- Including 10-hour maximum metered spaces within the scope of the coverage of the levy, or,
- Reducing the number and amount of on-street long stay spaces, by reducing the 10-hour maximum time limit and convert these to short-stay.

This will be a key priority for the new parking policy to address this directly to complement the Parking Levy scheme.

6.15 Scope for the Parking Levy to include all types of parking in the CBD.

The RFP for the Parking Levy was prescriptive in terms of the Levy only being applicable to off street car parks used by commuters. Although this would increase revenue, there is no intention that short stay parking either on or off street would be subject to the Levy and neither would CBD residents parking since these parking types do not contribute to the AM peak CBD congestion. However, as discussed in **sections 6.13 and 6.14** it is proposed to include the existing on street parking that is available to commuters in the form of coupon parking and 10-hour max meter parking in the CBD.

6.16 Lifespan of the Parking Levy

As with the existing international Parking Levy schemes, it is proposed that the lifespan of the Wellington Commuter Parking Levy will be indefinitely. This will allow the Parking Levy to fund ongoing investment in public transport, active mode and behaviour change initiatives. For the Nottingham Parking Levy, it was originally considered to operate the scheme for 23 years as this was the length of the Tram contract PFI deal. However, Nottingham City Council decided to put in the Parking Levy Scheme Order that the scheme would operate indefinitely with the Council needing to go through a formal process to cease operation of the scheme should it wish to do so. The reason for this is that by running the Parking Levy indefinitely then the revenue raised can be used for other public transport investment.

As detailed in **Section 7**, although the lifespan of the project will be indefinite the financial evaluation of the project in terms of benefits is based on a 2036 cut-off year and hence although the Parking Levy could remain indefinitely the benefits are only being claimed until 2036. As a Policy measure the Parking Levy will remain as indefinite as a measure to discourage car use. A decision on the lifespan of the Levy could be made near the end of the programme financing period. At this stage we are unable to determine what the appropriate Levy amount would be post implementation of the LGWM packages since the LGWM Capex plans are not as yet fully agreed and we are unable to credibly identify what would happen beyond the conclusion of the LGWM programme.

6.17 Hypothecation of Parking Levy revenue

For 3 of the existing Parking Levy schemes, their legal framework includes hypothecation of Parking Levy revenue (after accounting for the levy operating costs) to transport projects (ie ring fencing of the net proceeds for transport projects) as follows:

- Nottingham - net proceeds of Parking Levy used in developing transport infrastructure, eg, light rail expansion and redevelopment of Nottingham Railway Station (WPL Order, Annexes 1 and 2).
- Sydney – Parking Levy proceeds paid into Public Transport Fund, which is used to finance and encourage the use of public transport (PSLA, section 11).
- Perth - Parking Levy - proceeds used to fund Central Area Transit bus system, Free Transit Zone, and other transport infrastructure projects.

The Melbourne Parking Levy scheme though does not include for hypothecation of the revenue raised.

Based on our review of the existing schemes, hypothecation of the revenue from the Wellington Commuter Parking Levy to fund LGWM and future transport packages is considered essential to ensure:

- Provide ongoing funding of the LGWM programme.
- Big selling point of the Parking Levy.
- Likely to be more politically and publicly acceptable ie it's not just considered to be another tax.

6.18 Parking Levy Charge

As indicated in **section 7** a range of charges have been assessed with the \$2,500 charge and \$1,750 in Te Ato (including GST) is proposed. Even though it doesn't provide the 20% reduction in AM peak number of vehicles entering the CBD, it is considered that it strikes the right balance between fairness and mode shift. A higher levy could produce higher revenue and higher mode shift but there are political

considerations in terms of not choosing a higher levy. International examples provide us with an acceptable range of charges that have achieved their respective project objectives and outcomes and have been publicly and politically acceptable and therefore although it is theoretically possible to choose a higher rate, then on balance it is considered the \$2,500 charge (\$1,750 in Te Ato) is the most appropriate charge.

6.19 Parking Levy potential High-Tech options

As part of future work on the Parking Levy and the TBC SSBC, further work to identify high tech options (eg charging by use of a parking space by day rather than an annual charge) should be explored and appraised.



6.20 Potential Impact of Displaced Parking as a result of the Parking Levy

As outlined in **Section 3 and Appendix 3.1**, in the CBD fringes, on street parking is available as residential permits, coupon parking, metered 9 hour and 10-hour parking, free time restricted parking (eg at Clearways) and free unrestricted parking. These have all been included within the Parking Levy inventory and GIS database (see **section 5**) to assist (along with the Financial Model) assessment of the potential impacts of spill over or displaced parking as a result of the Parking Levy.

As outlined in **Section 3.4 and Appendix 3.1**, Coupon parking was introduced in 1994 to control commuter parking in inner-city suburbs and encourage the use of alternatives to commuting by car. Parking is managed through time limits and currently charges from 8am to 6pm on weekdays (although as detailed in **section 6.13** above Bowen Street hours are different due to the clearway). All-day parking (8am to 6pm) is currently \$12 per day or \$200 per calendar month and the first two hours of parking is free. This is to dissuade all-day commuter parking, while allowing access for short-term visitors. Evening (6pm to 8am) and weekend parking is free and has no time limit. Residents can buy a coupon exemption permit for \$120 per annum, and this entitles them to park in coupon areas at all times. It should be noted that coupon exemption permits are part of the resident parking scheme. Eligibility is determined by the address, with residents able to choose an option to have a coupon exemption permit rather than a resident permit which enables them to park in coupon parking spaces only. A resident permit enables residents to

park in both coupon and resident parking spaces within their zone. WCC have indicated that many commuters park and walk on the city fringe which causes issues for residents to park.

As detailed in **section 7** (Financial Modelling) two forms of displaced parking have been assessed:

- Displacement from high priced parking zones to low price parking zones (eg displaced parking to Te Aro and walk to Thorndon/Lambton Quay).
- Displacement from both high and low priced parking zones to CBD fringe Coupon parking.

Although rather dated, as detailed in **Section 3 and Appendix 3.1**, it is interesting to note that an assessment of the Coupon scheme one year after implementation, found that the number of commuter vehicles reduced by 25% and there was no displacement to adjacent non-Coupon areas. Bus ridership increased by 2%.

As detailed in **section 3 and Appendix 3.1**, based on WCC survey work there is:

- Limited capacity to accommodate any additional parking in the Coupon areas at Mt Victoria, Thorndon and Te Aro.
- There is evidence that residents and commuters are displacing users at Reserve Management car parks and adjacent streets sites at Hanson Street and Alexandra Road.
- There is evidence that unrestricted on street parking at Newtown and Berhampore shows high occupancy and long length of stay at weekdays indicating use by commuters. This though is most likely Hospital employees given that the CCDHB workplace Travel Plan survey (2019) indicated that 42% of staff park on side streets.

Section 7 of this report indicates that displacement to adjacent Coupon areas is predicted to be low (and this could be lower still if CBD Coupon parking and 10 hour max meter parking charges are increased).

The scope for the geographical boundary of the Parking Levy to be expanded and include a 2nd tier boundary to cover the wider Coupon parking areas outside the CBD (eg Mount Cook) was suggested by the TWG. However, this is outside of the defined scope of the Parking Levy study which was focused on the CBD boundary. Future work could explore this as an option.

Notwithstanding this, work will be required as part of the Parking Levy scheme development to understand supporting parking management plans that may need to be put in place prior to the implementation of the Parking Levy to mitigate any displaced parking. The following approach is recommended:

- Using the outputs from the Financial Model as a starting point, assess existing usage of all CBD/CBD fringe on street parking to provide a detailed hotspot mapping of all locations where displaced parking could occur (eg around employment centres and residential areas). This would then enable accurate assessments of the appropriate parking management measures required to tackle any displaced parking as part of the implementation and ahead of the Parking Levy go live. This could include:
 - Information on each business in the area plotted with the amount of car parking places liable for the Parking Levy, current public transport infrastructure, restrictions/orders already in place and businesses highlighted with current Travel Plans.
 - Assess the walking conditions from these parking areas to the CBD eg distance (1 km is a circa 12-minute walking journey to the CDB edge), terrain (steep hills, exposure to weather conditions) and other issues such as lighting (re pedestrian safety).
 - Education establishments in the area, such as schools and colleges, to be taken into consideration.
 - On site surveys including AM, PM and specific out of hours visits to ascertain the scope of commuter parking.

- Areas mapped with definitive boundaries within the Parking Levy parking inventory GIS database.
- Take into account any WCC proposed parking management programmes such as changes to resident parking schemes, changes to coupon parking, changes to 9hr/10hr metered parking, changes to review of free unrestricted and free restricted (eg clearways) parking, existing Council Reserve Management parking areas, intersection protection and updating lining and signing could then be accelerated pre-Parking Levy. These would be implemented with the intention of mitigating the risk of any potential displaced parking materialising especially in residential areas and minimising any potential Parking Levy income loss.
- Each area is likely to require different measures to effectively manage any existing issues and any potential hotspot locations and the solutions would be different and bespoke in each area. Therefore, the approach should not be a “one size fits all” but an in-depth analysis of each area, concluding with a complementary forward programme of works and appropriate solutions.
- By producing individual area solutions and reports, clear measures will become apparent that demonstrate a sustainable, cost effective way of delivering Parking Management measures likely to address locations of displaced parking and ensure the smooth implementation of a Parking Levy scheme, minimising any negative impact on the reputation of the scheme and maximising income generation (eg by introduction of new charges where appropriate).

Good practice would be to choose a pilot area, possibly where businesses flank residential and scope it to see what the potential impact could be and identify the viable solutions to address this. This would then inform which relevant scoping/assessment studies should be written for every area prior to introduction, to safeguard both the reputation of WCC and the Parking Levy scheme itself and maximise any income generation.



6.21 Management of the Parking Levy

Management is one of three inter-related areas, specifically:

- Legislative framework
- Governance arrangements
- Management

The legislative framework for the WCPL is discussed later in **Section 9**.

Our initial thoughts on the governance for implementation of the Parking Levy are:

- Parking Levy Board - The Board would consist of senior stakeholders and it is recommended that they meet on a bi-monthly basis or at key stages and decision points of the project. The Board would be provided with regular progress updates on the delivery of the project, the scheme design, high level risks and options. The Board would also be asked to review and approve key policy decisions and would provide guidance on issue resolution. They would provide direction that ensures the project is resourced and supported, whilst also being held accountable. The Parking Levy Board would need to interact with the existing responsibilities of the regional and local authorities, such as local and regional transport committees, and associated entities eg LGWM.
- Parking Levy Steering Group - The Steering Group would be chaired by the relevant Director with overall responsibility for the project delivery. This Director would be supported by a Programme Manager and a Project Manager; identifying other members of the steering group is flexible as people will be required at different stages and key points. Group members should be of an appropriate level so that the respective services are effectively represented. The Steering Group would follow a set agenda, meet monthly and be focused on project management delivery and issue resolution; they would also review progress on all the relevant work streams and undertake the necessary due diligence to take key decisions and preferred options to the Board for their review and approval.
- Weekly Project Progress Meetings - A weekly/fortnightly project progress meeting held between the Programme Manager, the Project Manager, Project Support Officer and other key members as required is recommended. A Project Plan should act as the basis for the progress meeting with any delays being identified and resolved. The progress meeting also provides an opportunity for project team members to highlight any delays or issues to the project which can either be resolved at the meeting or considered and discussed at Steering Group or Board level.
- A project plan would provide for example an estimation of the duration of each workstream throughout each stage of the delivery of the Parking Levy and identify Key Milestones and Dependencies.

At this stage we consider that the Parking Levy should be managed by Wellington City Council rather than GWRC or NZTA since the boundary of the proposed Parking Levy is wholly within the City Council and it would be preferable to use existing WCC expertise and systems. LGWM should not manage as it is not a legal entity. However, should the LGWM partners want to expand the Leviable area, then flexibility on the Levy management maybe required in the future. This report presents options - management and enforcement of the Parking Levy is dependent on the scheme design which would be carried out as part of the next stages of the project which will provide details of the management and enforcement measures. This will then provide input to the **TBC Commercial Case** covering:

- Whether management of the levy is outsourced.
- Are 3rd party services needed to deliver the parking levy? what? how will these services be procured? how will the contract be structured to appropriately manage risks?

This will also provide input to the **TBC Management Case** covering:

- Management plan (governance, management, reporting, change-management arrangements).
- High level project plan & key milestones (including work breakdown structure and key decision-points).
- High level communications / change management plan.
- Monitoring and evaluation plan.
- High-level risk management plan.

6.22 Risks and Uncertainties

Future work on the Parking Levy will provide a detailed description of how risks and uncertainties have been taken into account in the design of the Parking Levy (which will provide input to the **TBC Economic Case**).

A high-level assessment of risks and potential mitigation is though set out in **Table 6.2** below:

Table 6.2- High Level Risk assessment

Risk	Mitigation Measure
<p>Negative public perception of the Parking Levy scheme proposals and its benefits; it will be seen as "anti-car" and this could lead to:</p> <ol style="list-style-type: none"> 1) Increased opposition to the scheme from Occupiers/operators and the public. 2) Lack of political desire to progress a Parking Levy scheme 3) Delays or termination of the project. 4) Failure to deliver the Parking Levy package and modal shift objectives 	<p>Detailed communications should be released by LGWM to clearly set out the Parking Levy proposals, the vision for the city and the business case for why the scheme is being considered and the benefits it is expected to deliver. Due to the controversial nature of Parking Levy schemes, the need for ongoing communications and stakeholder management support will be required throughout the project to mitigate this risk and respond to any co-ordinated opposition to the scheme</p>
<p>Low levels of compliance from occupiers/car operators who choose to oppose the Parking Levy scheme. This could significantly damage the credibility of the scheme and generate negative media reporting. A continued low rate of compliance could lead to:</p> <ol style="list-style-type: none"> 1) A shortfall in funding. 2) The scheme losing credibility. 3) The Parking Levy charge increasing. 4) A reduced Parking Levy Package. 5) Lower impact on modal shift 	<p>Regular and ongoing communication and engagement with occupiers and car park operators is recommended as part of the implementation of the scheme. This communication and engagement should focus on compliance and also the promotion and offer of TBC support package to assist with compliance with the scheme and manage and reduce their Parking Levy liability before the scheme "goes live". This compliance-based approach opposed to an enforcement approach has seen Nottingham City Council achieve a 99.9% compliance rate with liable employers. By providing business support and educating occupiers, a higher rate of compliance will be achieved as businesses begin to see the benefits that a Parking Levy scheme can bring and will fully understand their legal obligations and the offences associated within the scheme.</p>
<p>High administrative burden for occupiers and public car park operators to license and comply with the Parking Levy scheme, which could damage relationships with businesses and result in negative responses to, and perceptions of, the scheme from both occupiers/operators and the media.</p>	<p>Early engagement with occupiers/operators to be undertaken as part of the implementation of the scheme, to develop the Parking Levy licensing system to minimise the administrative burden on occupiers/operators and the Parking Levy team. The ongoing provision of regular communication, support and advice to occupiers/operators on the licensing process will address any concerns and reduce the potential administrative burden once the scheme 'goes live'. In future years, the administrative burden will be reduced for occupiers/operators because when their licence needs to be renewed, they will only be required to confirm their licence details are still valid and will only need to amend their licence if their parking requirements have changed</p>

Once the Parking Levy scheme goes live there is a risk of displaced parking becoming widespread and persistent, which could lead to:

- 1) A shortfall in funding.
- 2) The scheme losing credibility.
- 3) Negative impact on citizens.
- 4) Negative media coverage.
- 5) Lower impact on modal shift.

Conducting a thorough displaced parking hotspot mapping exercise and preparing the relevant parking management changes where necessary in advance of the implementation of the Parking Levy scheme, will help mitigate the potential for large scale displaced parking in surrounding areas. Implementation of complementary parking policies should also be prioritised and introduced before the Parking Levy scheme goes live to mitigate any displaced parking and maximise income generation.

Enabling legislation not forthcoming. Potential risks arise in several areas, including but not limited to:

- Whether Central Government has the appetite for such legislation
- If so, then how the “Parking Levy Act” might interact with other legislative reforms related to transport pricing, such as road pricing, which are being investigated by other local authorities, such as Auckland.
- The timelines required for Central Government to draft, debate, and pass the legislation—noting existing pressure on the legislative timetable related to the COVID pandemic and RMA reform.
- If passed, the extent to which the “Parking Levy Act” enables, or otherwise, the WCPL recommended by the Study.

Alternative routes outlined in **Section 9**

In addition to the risks identified above, **Section 7.10** has provided a review of financial risks and **section 9.3.9** has indicated potential implementation barriers.



6.23 Options Assessment Methodology

The scope of this report, as defined by ministerial political direction and LGWM, is a Parking Levy aimed at commuters driving to the CBD. As a result, this work does not follow a traditional business case approach and does not consider alternative demand management approaches or solutions to the defined problem as they are out of scope. While this approach does not strictly follow a long list to short list to preferred option structure in a traditional business case, it achieves the same desired outcomes. The business case process we have used:

- Presents a structured, step-by-step investment story.
- Is fit for purpose based on risk and scale of the project.
- Identifies alternatives and possible options to form a number of project options.
- Assesses the performance of options relative to desired outcomes, and
- Demonstrates that the preferred option is the most effective at delivering the desired outcomes, is deliverable, and that the risks are acceptable.

Sections 6.3 to 6.22 have identified options considered in the development of the Wellington Commuter Parking Levy. Within Sections 7, 8 and 9 of this report, further specific economic, financial, legal details of the Levy are provided, which also includes identification and assessment of detailed Parking Levy implementation specific options along with presentation of a preferred option(s). For completeness these are included in the options assessment summary provided below in Section 6.25 which provides input to the Travel Behaviour Change Business Case inputs of a summary of how the recommended Parking Levy design was arrived at and options considered.

Within the defined project scope, optioneering has been completed for the following elements of the Parking Levy:

- Land use type for parking spaces that will be leviable under the scheme (eg residential, commercial, etc).
- Geographic boundary of the scheme.
- Differential Parking Levy pricing.
- Responsibility for paying the Levy.
- Discounts and exemptions.
- Method for classifying car parks as commuter vs. short stay spaces.
- Pricing level (including opportunities for varying prices by geographic area).
- Treatment of on street Coupon parking that lies within the Parking Levy boundary.
- Treatment of on street 10-hour max metered parking that lies within the Parking Levy boundary
- Levy collection mechanism.
- Timeline for introducing the Parking Levy.
- Hypothecation of funds to transport projects.
- Implementation Pathways.

6.24 Options Assessment Criteria

Table 6.3 below summarises the criteria used to assess the options:

Table 6.3 Options Assessment Criteria

Project Element	Assessment Criteria
Land use type for parking spaces that will be leviable under the scheme (eg residential, commercial, etc).	<ul style="list-style-type: none"> • Targets commuters and excludes short stay visitors and residents. • Implementation and compliance costs are minimised. • Is customer friendly and encourages compliance.
Geographic boundary of the scheme.	<ul style="list-style-type: none"> • Is easy for public and businesses to comprehend. • Aligns with common sense definition of CBD.
Discounts and exemptions	<ul style="list-style-type: none"> • Implementation and compliance costs are minimised. • Is customer friendly and encourages compliance.
Method for classifying car parks as commuter vs. short stay spaces.	<ul style="list-style-type: none"> • Targets commuters and excludes short stay visitors and residents. • Is customer friendly and encourages compliance.
Pricing level (including opportunities for varying prices by geographic area).	<ul style="list-style-type: none"> • Is equitable/fair. • Achieves desired mode shift outcomes.
Treatment of on street Coupon parking within the Parking Levy boundary	<ul style="list-style-type: none"> • Achieves desired mode shift outcomes.

Treatment of on street 10-hour max meter parking within the Parking Levy boundary	<ul style="list-style-type: none"> • Achieves desired mode shift outcomes.
Levy collection mechanism/responsibility for paying the Levy.	<ul style="list-style-type: none"> • Is implementable. • Implementation and compliance costs are minimised. • Is customer friendly and encourages compliance.
Timeline for introducing levy.	<ul style="list-style-type: none"> • Is implementable. • Is customer friendly and encourages compliance.
Hypothecation of Funds to transport projects	<ul style="list-style-type: none"> • Political and public acceptability • Guaranteed source of funding for transport projects.
Parking Levy Charge	<ul style="list-style-type: none"> • Achieves desired mode shift outcomes. • Guaranteed source of funding for transport projects.
Implementation Pathways.	<ul style="list-style-type: none"> • Potential barriers to implementation • Political and Public acceptability



6.25 Summary of options assessment

Table 6.4 provides a summary of the options assessment:

Table 6.4 Options Assessment

Option	Reason for Rejection
Method for classifying car parks as commuter vs. short stay spaces.	
Scope for the Parking Levy to include all parking in the CBD (ie short and long stay, on and off street).	As detailed in section 6.14 , although this would raise more revenue, this has never been a stated objective of the LGWM package and is contrary to the Parking Levy RFP. Also likely to be politically and publicly unacceptable.
Treatment of on street commuter parking within the Parking Levy boundary	
Scope for the Parking Levy to include existing on street Coupon commuter parking and 10-hour max meter parking within the Parking Levy boundary.	<p>As detailed in sections 6.13 and 6.14, although only representing a small number of the commuter parking spaces in the CBD, it is considered appropriate to address (eg via increased charges, change to on street meter) the Coupon parking and the 10-hour max meter parking areas within the Parking Levy boundary because:</p> <ul style="list-style-type: none"> ▪ Public perception of WCC: simultaneously levying private commuter car parking providers while exempting WCC controlled commuter car parking could be seen as unfair/hypocritical by the public and jeopardise the success of the Parking Levy scheme. ▪ It is at odds with the desired outcome of the Parking Levy: While it may represent a relatively small proportion of commuter parking in the CBD, including coupon parking and 10-hour max meter parking in the Parking Levy scheme will contribute to the desired outcomes of the programme: discouraging car commuting to the CBD, raising revenue, and prioritising parking for short stay and residents use instead of commuter use.
Geographic boundary of the scheme	
Scope for the Parking Levy Boundary to be wider than the CBD boundary	As detailed in section 6.12 , the LGWM stated objective of the Parking Levy is to reduce vehicles entering the CBD in the AM peak. However, options to safeguard potential future expansion of the leviable area beyond the CBD are outlined.
Definition of the CBD and the Parking Levy Boundary	As detailed in section 6.11 and Table 6.1 the targeted rate boundary has been used.
Timeline for introducing levy.	
Implement the full Levy charge in the 1 st year of operation.	<p>As detailed in sections 6.10 and 7, to implement the full charge in the 1st year, as opposed to incrementally increasing it over for example 3 years, could cause acceptability issues as well as not allowing car park operators time to adjust their operations with the Levy.</p> <p>However, with the full charge in year 1 then the travel mode objectives maybe achieved in a reduced timeframe.</p>

Pricing level (including opportunities for varying prices by geographic area).

Applying the Levy at the same cost across the whole of the CBD.	As detailed in sections 6.9 and 7 this was rejected for equity reasons since parking costs in Te Aro are lower, driving mode share is higher, even though workers there are on lower incomes. Te Aro is further from the train station as well and hence public transport access from the north is not currently as good as the rest of the CBD.
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Levy collection mechanism/responsibility for paying the Levy.

Type 1 – property owner responsible	As detailed in section 6.4 rejected given the Gross Rates situation in Wellington.
Type 2 – property owner responsible	As detailed in section 6.4 rejected.

Discounts and exemptions

Apply discounts	As detailed in section 6.7 no discounts proposed for the Wellington Commuter Parking Levy in order to keep the Levy as easier to administer as possible and also is not considered conducive to modal shift.
Various options on exemptions for Type 1 parking as detailed in section 6.4	<ul style="list-style-type: none"> • Carpool spaces have not been exempted since this would be difficult to administer. • Include all locations regardless of the size of the car park – Nottingham City Council have advised that this would increase administration costs to include every single private employer off street car park – however the Sydney Parking Levy does not have a threshold number. • Use a different threshold as opposed to 10 or less. Section 5 on parking inventory indicates that there is very little difference in the numbers for 10 or less categories and hence why 10 or less is the chosen threshold.
Various options on exemptions for Type 2 parking as detailed in section 6.5	<ul style="list-style-type: none"> • An option to exempt parking spaces allocated for car share (eg Mevo and Cityhop) was considered but rejected because currently there are no spaces allocated in any CBD off street public car park for these schemes. • An option to exempt parking spaces leased by CBD residents in a public car park was considered but rejected since this would be difficult to administer and controls would then need to be put in place to prevent residents then leasing the parking space to a commuter.

Land use type for parking spaces that will be leviable under the scheme (eg residential, commercial, etc).

Definition of Type 1 (off street private car parks) – see section 6.4	Option B rejected since this could make the exemption list rather long and potentially open to interpretation and difficult to manage. Education would not be exempt to
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	ensure students are liable. How regular business visitors are captured would need to be explored. Option B does not necessarily tie in with the description of the Parking Levy being a Commuter Parking Levy since, at the outset, it infers all private parking spaces are leviable.
Definition of Type 2 (off street public car parks) – see section 6.5	Option A wording rejected since considered more difficult to administer than Option B. In the Nottingham scheme, if an employer has contracted parking for its employees at a public car park then the employer is liable and is captured. However, the Nottingham scheme does not capture employee paid parking in public car parks since it is aimed at employers only and therefore this option was rejected.
Apply Levy to CBD residential parking spaces– see section 6.6 .	Rejected because CBD residents are not contributing to the number of cars driving in and parking in the CBD in the AM peak.
Apply Levy to CBD residential parking spaces leased to Commuters – see section 6.6 .	At this stage rejected because: <ul style="list-style-type: none"> • The numbers involved per owner/tenant will be lower than the 10 or less spaces threshold proposed for Type 1 private parking. • It is not clear whether this is a large enough problem worthy of the increased administrative costs. <p>We do though recommend that this is considered in more detail should LGWM view this is a potential problem and if it is considered that residential car parking arbitrage may be a future issue.</p>
CBD residents who lease a parking space in a public car park - see section 6.6 .	At this stage rejected because: <ul style="list-style-type: none"> • Numbers involved is unknown. • Could be difficult to administer. <p>We do though recommend that this is considered in more detail should LGWM view this is a potential problem.</p>

Hypothecation of Parking Levy revenue

Don't hypothecate funding	Based on our review of the existing schemes, hypothecation of the revenue from the Wellington Commuter Parking Levy to fund LGWM and future transport packages is considered essential to ensure: <ul style="list-style-type: none"> • Provide Ongoing funding of the LGWM programme. • Big selling point of the Parking Levy. • Likely to be more politically and publicly acceptable.
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7.0 FINANCIAL MODELLING

7.1 Levy design options

The policy and regulatory design options are described in **sections 6 and 9** of this report. This analysis looks in particular at five main components of the design of the levy with regards to how it impacts financial modelling:

1. The catchment area (or boundary) of the possible parking levy, and the options associated with this.
2. The potential amount of the levy to be charged to owners and operators of carparks.
3. The carpark types that are included in the scheme.
4. The amount of the levy that could potentially be charged to owners and operators of carparks, and.
5. The level of the levy within the catchment area and boundary, and whether a differentiated levy rate should be considered within the catchment area.

We describe each of these items below.

7.2. Catchment area (boundary)

The original stated intent of the parking levy and the scoping exercise was to introduce a 'a levy on commuter parking in Central Wellington. 'Central Wellington' was later defined as the CBD of Wellington. Interestingly, as detailed in **Section 6**, there is not a consistent definition of what constitutes the 'central business district', nor is there a consistent use of a boundary associated with the CBD, even within Wellington City Council. As detailed in **Section 6**, for purposes of consistency with how a parking levy may be implemented and given that the *Downtown Targeted Rate* area is a well-known definition to the business community within Wellington City and, in particular, the central business district, we suggest that the boundary defined by the downtown targeted rate is the most useful and closest approximation of individual and business' understanding of 'Central Wellington'/CBD.

7.3 What level should the levy be set at?

7.3.1 Background

The second item that the team considered is the level at which any proposed parking levy should be set. Initially, this work was guided by the analysis completed within the *Programme Business Case* which produced the indicative package.

This *Programme Business Case* recommended package included a recommendation to introduce a '*road pricing mechanism to manage private vehicle demand and promote alternative modes*. This included a statement that '*the recommended package includes congestion pricing. This will include one or a number*

of tools that charge motorists to drive in to the central city, such as a central city cordon charge or parking levies.⁷

The recommended package financial analysis was conducted on the basis of a cordon charge for entering the central city in the order of \$5 - \$10 that was focussed on busy times. This model presumed that commuters were directly charged this congestion charge and that this cost was fully passed through to commuters. This congestion charge indicated up to a 20% reduction in commuter traffic to the CBD during the morning peak.

The Wellington Analytics Unit (WAU) in effect took an outcomes-based approach to defining the level of the charge, with the aim to reduce car trips to the CBD by 20% according to the WTSM model outputs.

Subsequent to the *Programme Business Case*, the *Let's Get Wellington Moving Team* received direction that the cordon charge should instead be considered as a parking levy. The Wellington Analytics Unit completed additional analysis on the prices associated with carparks and the impact on demand. In general, this indicated that a reduction of car-mode share of -16% or -27% would be achieved if a levy was set at \$9 per day (\$2,250 per annum, assuming 250 working days per year) or \$14 per day (\$3,500 per year).⁸

The WAU team however, noted some specific limitations with this data, which included:

- It presumed that the cost of any congestion charge or levy would be fully passed through to commuters; evidence from other jurisdictions is that if a parking levy is introduced, the level of pass-through of the levy to commuters can sometimes be as low as 50%. As also noted later in this report, fringe-benefit tax interpretations associated with business carparks also mean that the full cost of a levy is not passed through to certain employees that are provided with an employer carpark.
- There are differences in the median car-park prices in the CBD which likely impact the ability to consistently set a levy across the CBD in a way which is seen as 'fair', and demand reduction will be dependent on the increase/decrease in the total cost of parking, not just the level of the levy charged.
- The prices within the WTSM model were not inflated to 2020 \$s, and it was later unclear whether GST has been included or excluded in the cost of the levy/cordon charge when assessing the demand impact of the changes.

7.3.2 What do other jurisdictions charge?

As noted above, if a parking levy were to be applied in the same way that the original modelling estimated, this would imply an annual parking levy of somewhere between \$2,250 and \$3,500 per year in 2020 dollars. This would make a Wellington parking levy one of the most expensive parking levies in the world at today's prices. A breakdown of the amounts charged in other jurisdictions that have a parking levy is included in **Table 7.1**, below.

⁷ *Let's Get Wellington Moving PBC Draft Report 21 June 2019, Pages 76-77.*

⁸ Note that these numbers are inflated from 2003 numbers to 2020 numbers, as the WTSM model pricing estimates are in 2003 dollars.

Table 7.1: Parking Levy Rates across the world where parking levies have been introduced.

Jurisdiction	Levy Amount ⁹
New South Wales – Sydney	Category 1: AUD \$2,490 per space (circa \$2690 NZD) Category 2: AUD \$880 per space (circa \$950 NZD)
Victoria – Melbourne Congestion Levy	Category 1: AUD \$1,460 per space (circa \$1580 NZD) Category 2: AUD \$1,040 per space (circa \$1120 NZD)
Western Australia – Perth Parking Levy	Tenant Parking: AUD \$1,169.20 (circa \$1260 NZD) Long-Term Public Parking: AUD \$1,124.40 (circa \$1210 NZD) Short-Stay Public and On-Street: AUD \$1,038.90 (circa \$1120 NZD)
Nottingham Workplace Parking Levy Scheme	Workplace Parking Levy: £415 per annum (circa \$830NZD)

As you can see from **Table 7.1**, above, a parking levy set at \$3,500 per annum would make the Wellington parking levy the most expensive parking levy in the world. A levy set at \$2,250 per annum would make it slightly less expensive than the Category 1 Sydney price

7.3.3 What is the median price of commuter car parking in Wellington City?

We also analysed the current price of long-stay commuter parking within the Wellington CBD, as a way to test the impact of the potential introduction of any levy, as commuter’s willingness to pay such a charge will be tied to the overall impact on parking prices that it has when compared to the current cost of parking.

The results of this analysis are presented in **Table 7.2** below. What becomes immediately clear in the analysis is that there are two main pricing differences across three main locations within the leviable boundary that we have proposed.

Table 7.2: Median annual parking costs across Wellington CBD

Zone	Median annual parking costs, calculated on the basis of early-bird parking rates	\$2,250 Parking Levy introduction and 100% pass through	\$3,500 Parking Levy introduction and 100% pass-through
Pipitea – Stadium Area	\$3,510	\$5,760 (+64%)	\$7,010 (+100%)
Thorndon / Lambton Quarter	\$5,160	\$7,410 (+43%)	\$8,660 (+67%)
Te Aro	\$3,510	\$5,760 (+64%)	\$7,010 (+100%)

Not surprisingly, parking prices are not consistent across the entirety of the CBD. In particular, prices are lower in Te Aro than in the rest of the CBD, due to different land-use and commuter patterns that present themselves in this area. Prices for parking are also lower in the northern portion of Pipitea, primarily driven by the outsized presence that the Stadium car park holds in driving prices in this segment of the CBD, and its considerable walking distance from the rest of the ‘core’ CBD’.

In general, parking prices in ‘lower-priced’ portions of the CBD tend to be about 70% of the prices charged in to the ‘core’ Thorndon and Lambton quarter area.

⁹ All figures in this table are in 2019/20 AUD or pounds.

7.3.4 So, what is ‘fair’?

In general, the research we have completed would appear to indicate that setting the parking levy at more than \$2,500 per annum would be difficult, for the simple reason that setting the parking levy at such a level would represent an increase of parking prices in the CBD of near 100%, and that setting the levy at above \$2,500 per annum would make the Wellington parking levy the most expensive parking levy in the world.

We have analysed four possible levy levels that are included in the financial model; in addition, we also include a ‘ramp-up’ or introduction period of the levy, so that it is phased in over a period of three years (this has been a common approach in other jurisdictions). An assessment of the levy levels and our recommendation is included in **Table 7.3**, below.

Table 7.3: Parking levy level and revenue/demand impacts

Levy Level	Increase in parking prices	Gross Revenue raised	Demand reduction	Recommended
\$500 per annum	+14% in low price zones +10% in high price zones	Circa \$6m per annum	-2%	NO as does not reduce demand to a sufficient degree
\$1,000 per annum	+28% in low price zones +19% in high price zones	Circa \$12m per annum	-4%	NO as does not reduce demand to a sufficient degree
\$2,500 per annum	+71% in low-price zones +48% in high-price zones	Circa \$28m per annum	-10%	YES, although differentiate based on existing pricing (see later section)
\$5,000 per annum	+142% in low-price zones +97% in high-price zones	Circa \$45m per annum	-21%	NO as likely perceived as not affordable for commuters

7.3.5 Should the levy be differentiated across different zones within the CBD?

As noted previously, there is a significant difference in median parking prices spread across three main CBD locations. These are:

- A ‘high-price’ zone, which includes WTSM Zones 37, 38, 57, 58, 59, 60, 62, 63, 64, 65, and 66, and could be largely defined as the Thorndon/Lambton Quarter/‘Golden Mile’ area.
- A ‘low-price’ zone, which includes WTSM Zones 39, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, and 56. This includes two main areas: all of Te Aro, and the area immediately adjacent to Sky Stadium, in Pipitea (WTSM Zone 39).

As also shown above, both Sydney and Melbourne schemes charge a differentiated levy rate based on the location of carparks.

Given the differential in median parking prices across the two sectors in Wellington, we also suggest that such an approach in Wellington would be appropriate. For this reason, we have modelled the introduction of a levy such that it is a proportional rate of the median parking price between the high priced and low-priced sectors in the model.

This means that the parking levy is set at a rate of approximately 70% of overall level in the low-priced zones as it is in the high-priced zones. This is shown in **Table 7.4** below.

Table 7.4: Differential levy levels as proposed and included in the financial model.

Levy Level ¹⁰	Differential Levy
\$500 per annum	Category 1: \$500 per annum in high priced zone Category 2: \$350 per annum in low-priced zones
\$1,000 per annum	Category 1: \$1,000 per annum in high-priced zone Category 2: \$700 per annum in low-priced zone
\$2,500 per annum	Category 1: \$2,500 per annum in high-priced zone Category 2: \$1,750 per annum in low-priced zone
\$5,000 per annum	Category 1: \$5,000 per annum in high-priced zone Category 2: \$3,500 per annum in low priced zone

7.4 Car park types included in the scheme.

As noted elsewhere in this report, different jurisdictions have implemented slightly different parking levy schemes, each with some different coverages and inclusions and exclusions. **Section 6 and 9** of this report discuss some of the proposed specific exclusions, but here we describe which types of carparks we have included or excluded within the financial modelling.

As the stated purpose of the parking levy is to 'reduce the amount of cars entering the CBD during the AM peak', it would make sense to target the levy at commuters – for this reason, we suggest that the levy should be targeted at **long-stay commuter carparking**; not short-stay, on-street carparking.

Our supply inventory information also indicates that the split of public and private carparks is roughly equivalent – that is, there is close to a 50/50 split of carparks provided on employer premises, and carparks provided in public car parking facilities. For this reason, we suggest that both employer and public car parking facilities should be included in the levy.

A summary of the car-park types and those that are included in the levy and financial model are included in **Table 7.5** below:

¹⁰ Throughout the rest of the document, when we refer to the levy as a \$2,500 levy, we are referring to a levy with two different levels – a Category 1 level of \$2,500 in high-priced zones, and a Category 2 level of \$1,750 in low-priced zones.

Table 7.5: CBD Carpark types and exclusion/inclusion in current financial model

Car park type	Included or excluded
Public car parking facilities	Included
Private car parking facilities	Included
Commuter (long-stay)	Included
On Street Commuter and 10-hour Max meter parking within CBD	Included - to be managed as part of complementary WCC Parking Policy
Casual (Short stay)	Excluded
Retail	Excluded
Residential	Excluded
Carparks with 10 or fewer spaces	Excluded – helps to blunt the impact of the levy for small and medium businesses, and is a common exclusion in other jurisdictions

It should be noted that the financial model allows for the inclusion of a range of carpark types even if we have recommended them for exclusion at this point.

7.5 Preferred option

Using the information above, our preferred model for the parking levy is:

- A commuter parking levy, covering all off-street public and private commuter carpark spaces where the occupier/operator is providing more than 10 carparks and these carparks are occupied on a given day for purposes of providing car park for commuters, which is located within the CBD (defined as the Wellington Downtown Targeted rate boundary), with a levy amount set at \$2,500 per annum in the Thorndon/Lambton Quarter sector, and a \$1,750 per annum in Te Aro and Pipitea.
- This scope is paired with a proposed introduction year of the levy in 2025, and a three-year phase in period for the levy, such that, in year 1 of operation, only 33% of the full amount of the levy is charged – in year 2, 66%, and, finally, in year 3, 100% of the level of the levy.

However, the financial model itself contains a number of scenarios, and has the ability to be updated by the LGWM Programme Team. A summary of all the variables that can be adjusted in the model are:

- The introduction year of the levy.
- The amount of the levy (four levels are included in the financial model by default: \$500, \$1,000, \$2,500 and \$5,000 per annum).
- Whether all carparks are levied, or only occupied car parks are levied.
- The phasing in rate of the levy, from a period of as little as 1 to up to 5 years.
- Whether a differential levy is applied in high-priced and low-priced areas of the CBD.
- The pass-through of the levy from owners and operators to commuters (this is set at 60% for public off street car parks and 50% for private off-street carparks, in line with our research and literature, but we have also sensitivity tested this at up to 80%).
- The elasticity of demand scenarios – and the ability to select from three scenarios – a low
- The elasticity of demand scenarios – and the ability to select from three scenarios – a low, medium, and high scenario, with different elasticity rates applied to each trip origin sector according to the scenarios. The model currently uses the ‘medium’ scenario, but all scenarios are included in **Table 7.6** below.

Table 7.6: Demand elasticity scenarios available for selection in the financial model

		Elasticity scenario		
		1	2	3
Trip origin sector		Low	Mid	High
CBD	go01	-0.23	-0.39	-0.59
Miramar / Kilbirnie / East	go02	-0.23	-0.38	-0.73
Newtown / Island Bay / Berhampore / Brooklyn	go03	-0.36	-0.43	-0.61
Karori	go04	-0.47	-0.55	-0.88
Khandallah, Ngaio	go05	-0.37	-0.51	-0.75
JVL, Hutt Valley, Northern suburbs, rest of region	go06	-0.38	-0.44	-0.67

- The displacement of cars from the CBD levy parking zone to areas outside the levy zone (this is estimated as 7% of total demand following the introduction of the levy based on estimated existing capacity of coupon parking). This is also similar to the range of 5.9% to 8% of drivers in the stated preference survey who would displace to cheaper parking outside of the CBD should parking charges increase by
- Whether carparks with 10 or fewer carparks are included or excluded from the levy (our recommendation is that carparks with 10 or fewer carparks are removed from the scope of the levy).
- Whether certain off-street carpark types are included in the scope of the levy (such as Commercial, Government entity, Charities, Crown Land, Foreign embassies, Educational, Not for profit, and health services carparks).

7.6 Description of financial model

7.6.1 Background

This section provides a high-level description of the financial model. It outlines the methodology, the model inputs and outputs, as well as the key assumptions underpinning the model. Key elements of the model are discussed in more detail in **Section 7.7**.

The main data sources used in developing the financial model were:

- The WTSM Wellington region transport model forecasts (validated using the Wellington Cordon survey and Census journey to work data).
- Wellington City Council Rating Information Database (for current car park supply inputs).
- Public parking database and price analysis undertaken by RCG.
- International demand elasticity literature.
- Demand, supply and levy passthrough data from overseas parking levy schemes (Nottingham, Melbourne, Sydney and Perth).
- Cost information from the Nottingham City Council Workplace Parking Levy scheme.
- Parking Levy Stated preference Survey (see **section 2.3** and **Appendix 2.2**).

7.6.2 Purpose of the model

The objectives of the Wellington commuter parking levy financial model are to:

- Evaluate the effectiveness of the parking levy options in terms of reducing the number of cars entering the CBD cordon and improving network efficiency.
- Identify the differences in travel behaviour change and revenue between the use of a parking levy and the Programme Business Case.
- Analyse the impact of 'spill-over' or 'displacement' demand in areas adjacent to but outside of the parking levy zones.

- Forecast the net revenue that could be attained from a parking levy, taking into account the costs of establishment, implementation, collection and compliance.
- Assess the impact on other council revenue sources that may result from introducing a parking levy, such as an increase (or reduction) associated with car parks operated by the Council or increase in public transport revenue.

We note that the primary objective of the Wellington commuter parking levy is to encourage mode shift away from driving private vehicles into the CBD. The secondary objectives of the levy are to raise revenue to fund other LGWM projects and improve network efficiency at peak times.

Assessment of the potential cost impact of a parking levy by household, including the distribution of costs across different household segments and categories of road user is presented in the Economic Appraisal section of this report (**Section 8**).

7.6.3 Model parameters

This is detailed in **Appendix 7.1** with the key model parameters being:

- All dollar values are in real 2020 currency terms (undiscounted).
- The model time period is 2020 to 2036. This matches the WTSM model time period.
- While further years could be forecast by extrapolating the WTSM model trend, forecasting private vehicle use too far into the future has challenges due to the unpredictable impact of technology advances.
- GST is included in the levy price inputs and, in the price, passed through to the commuter.
- Costs and revenue outputs exclude GST.
- Revenue and cost outputs are in financial years (1 July – 30 June).
- The year the levy is introduced, and the phase-in period can be selected in the model.

7.6.4 Model schematic and methodology

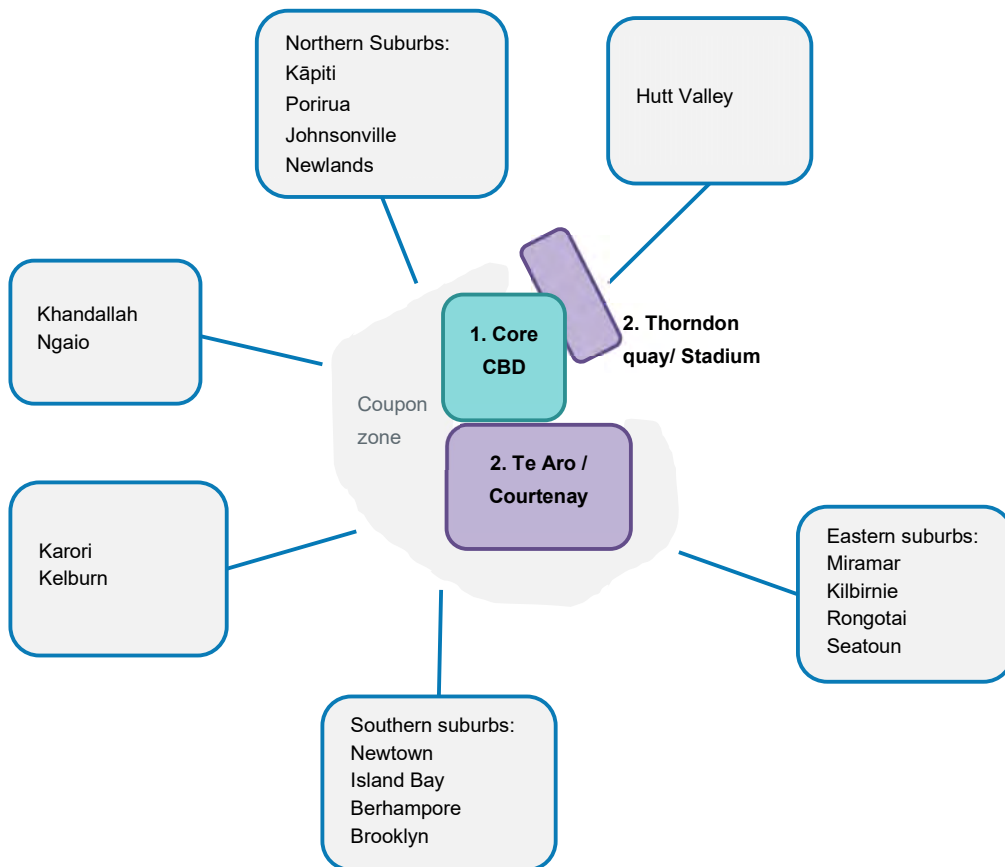
The financial model estimates the reduction in demand for commuter parks in the CBD as a result of the levy. The CBD is split into 2 levied zones, based on current parking prices:

1. **Core CBD:** High price CBD parking zone. (Wellington Central, Pipitea (excluding the Stadium), Thorndon) – shaded green in **Figure 6.2** below:
2. **Te Aro and the Stadium:** Lower-price CBD parking zone. This is shaded purple in **Figure 7.1** below.

The demand response to the levy is estimated separately depending on the area the commuter lives. As shown in **Figure 7.1** below, six commute starting areas are modelled. These commute origin areas are based on the “GO zones” in the WTSM model. The base commuter demand volume forecasts for each origin-parking destination pair, without a levy, are based on the WTSM model. The WTSM model also forecasts the volume of “through-trips” to areas outside the CBD area.

The financial model estimates the corresponding reduction in car park supply that results from the demand reduction and uses this to estimate gross and net revenue raised by the levy, taking into account establishment and operating costs.

Figure 7.1 Financial model schematic



7.6.5 Model methodology

The calculation methodology of the model is as follows:

1. Set the levy price for each CBD parking zone and the year the levy is introduced (including phase-in of the levy).
2. Estimate the proportion of the levy that will be passed through to consumers in the parking price, based on available evidence in overseas jurisdictions. A separate passthrough proportion is estimated for public operator-run car parks and for private car parks (eg in office buildings).
3. Use the parking price increase to calculate the reduction in demand for commuter parking in the CBD. The reduction in commuter parking demand for each CBD parking zone resulting from the price increase is determined using the elasticity of demand, by suburb area (ie trip origin area). The demand response also includes a calculation of the volume of cars displaced to long-term parks outside the levied area ("spillover").
4. The demand response can be tailored depending on the suburb the commuter lives in. The demand response is calculated separately for each suburb area and aggregated.
5. Determine the change in the volume of commuter parking demand for each of the 2 CBD zones, and for different parking types within each zone. This is used to estimate the potential reduction in private vehicles entering the CBD cordon (taking into account spillover demand to areas outside the levied area).

6. Estimate the car park supply response based on the demand reduction, taking into account typical occupancy rates.
7. Determine the levy revenue based on the number of leviable car parks (as defined by the scheme design). Two options are included in the model:
 - a) all car parks supplied are levied (including unoccupied long-term car parks), or
 - b) only occupied car parks are levied.

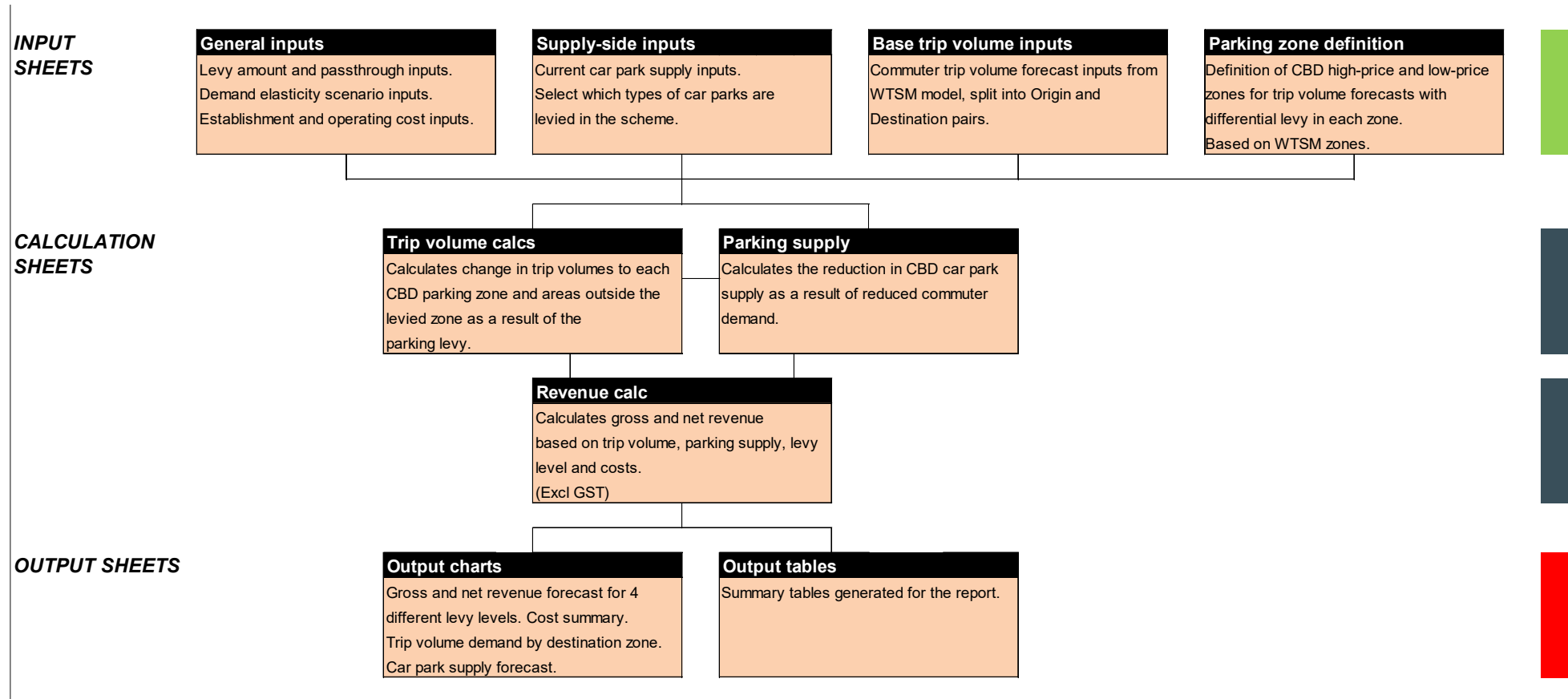
The levy rate is calculated as GST inclusive on the supply and demand side for purposes of modelling travel behaviour change. This is because the actual increase or decrease in commuter behaviour will be a result of the total amount of the levy that is passed on, inclusive of GST.

For the purposes of calculating revenue, however, the revenue collected is estimated as GST exclusive. The calculation methodology for revenue, net revenue and operating costs is as follows:

- Set the levy price and year of implementation (including any potential for ramp-up in pricing of the levy).
- Include estimates for establishment and start-up costs for the levy scheme based on the Nottingham and Australian jurisdiction introductions.
- Determine the number of leviable car parks that exist in a given year, given supply-side changes as a result of the introduction of the levy.
- Remove GST from the levy price and multiply the number of leviable car parks by the annual levy.
- Calculate the total amount of gross revenue collected on an annual basis.
- Estimate annual operating costs based on Nottingham levy scheme introduction.
- Estimate a bad debt provision, and account and calculate debt write-offs.
- Estimate the amount of levy paid by Wellington City Council operated car parks and subtract this to leave net revenue to the Council.

The model map below illustrates the structure of the financial model. The levy inputs, demand-side and supply-side inputs are used to calculate the change in commuter trip volumes, which determines the change in parking supply, which is then used to calculate revenue from the scheme.

Financial model map



7.6.6 Model inputs

Parking Supply Inputs

Parking Supply inputs	Source
<p>Current number of car parks in the CBD. Split into the following categories:</p> <p>Broad car park category:</p> <p>Off-street, available to the public – Operator-run (eg Wilsons, Care park)</p> <p>Off-street, available to the public – Wellington City Council-operated.</p> <p>Off-street, private, not available to the public:</p> <ul style="list-style-type: none"> Office buildings Government entities Foreign embassies Educational, Not for profit organisations Health service providers <p>Residential</p> <p>Retail</p> <p>Car park type:</p> <ul style="list-style-type: none"> Commuter parks (all day parking) Casual parks (short-stay hourly parking) <p>Parking zone:</p> <ul style="list-style-type: none"> High-priced CBD parking sector (Core CBD) Low-priced CBD parking sector (Te Aro + the Stadium) 	<p>Wellington City Council Rating Information Database (RID).</p> <p>RCG commercial parking inventory.</p>
<p>Current prices, by car park type and CBD parking zone.</p>	<p>RCG parking inventory analysis.</p> <p>Meetings with all public car park operators.</p>
<p>The proportion of the levy that will be passed through to consumers in the parking price, with the option to differentiate based on:</p> <ul style="list-style-type: none"> • Operator-run carparks • Office carparks <p>The rationale for creating the option to have different pass-through rates is that it is likely that pass-through rates for operator-run car parks will be higher than office car parks.</p>	<p>Data from overseas examples, including information from the Australian parking schemes</p>

<p>Supply response to reduction in demand (elasticity of supply for commuter parks). Factors influencing supply elasticity:</p> <p>Ability of operators and owners to pay the levy.</p> <p>Number (or proportion) of commuter parks converted to casual parks.</p> <p>Number of commuter parking facilities (and number of parks) converted to an alternative use.</p> <p>Time over which supply adjusts.</p>	<p>Data from overseas examples</p> <p>Information on private business carparks from Nottingham City Council and Australian jurisdictions, which indicated supply response following introduction of levy.</p> <p>Data from the Stated Preference survey.</p>
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Commuter parking demand inputs

Volume inputs	Source
<p>Current and forecast number of private vehicles entering CBD cordon at morning peak (without levy). Split by:</p> <p>Area of trip origin, and</p> <p>Parking zone (trip start-stop) – High price CBD zone, Low price CBD zone; outside levied CBD area.</p>	<p>WTSM model.</p> <p>2013 and 2036. Volumes between these years are interpolated in the model.</p> <p>Data validated using the Wellington Cordon survey data</p>
Elasticity of demand	
<p>Elasticity of demand to increases in price. Factors influencing demand elasticity:</p> <p>Median income, by area/suburb</p> <p>Willingness to pay by commuters.</p> <p>Relative price and accessibility of alternative modes.</p>	<p>International literature in the first instance.</p> <p>Results from the Stated Preference Survey.</p>
<p>Displacement number / proportion:</p> <p>To coupon parking zones (and other unrestricted metered parks) outside defined CBD boundary.</p> <p>To casual parks (hourly parks).</p>	<p>Information from Nottingham City Council following introduction of levy in the first instance.</p>

Levy and cost inputs	Source
<p>Levy amount:</p> <p>By parking zone (differential pricing).</p> <p>Timing and implementation of the levy and potential levy increases (phase-in)</p>	<p>The model currently has run four levy scenarios (incl GST):</p> <ul style="list-style-type: none"> • A \$500 annual levy • A \$1,000 annual levy • A \$2,500 annual levy • A \$5,000 annual levy
<p>Establishment, implementation costs and operating costs of the levy,</p>	<p>Data from overseas examples</p> <p>Auckland parking levy assessment, 2005.</p>
<p>Operating costs, including cost of collection and compliance.</p>	<p>Nottingham City Council Parking levy scheme.</p>

7.6.7 Model outputs

Transport impact outputs

The following summarises the outputs of the model relating to transport impacts.

Transport impact volume outputs	Notes
Number of cars entering the CBD cordon at morning peak. This output will feed into a transport model to assess the impact on network efficiency.	This would be used to calculate whether the levy achieves the desired reduction in commuters. Note that the target from WTSM only measures the volume at morning peak, so the model outputs only calculate the reduction in vehicle traffic at morning peak.
Number of commuter cars occupying leviabile commuter parks, by the suburb area of trip origin.	
Number of leviabile car parks, in each of the two CBD parking zones	
Number of cars displaced to adjacent coupon parking zones, or other types of park.	Displacement will also be calculated on the basis of displacement from the high-priced parking zone (ie, Thorndon) to the low-price parking zone (Te Aro).

7.6.8 Financial Outputs

The following summarises the outputs of the model relating to financial impacts.

Financial outputs	Notes
Total levy revenue and net revenue	This would take account of any ramp-up in the levy, year of introduction, and the proportion of carparks that are leviabile. Net revenue will take into account levy paid by car parks operated by the Wellington City Council.
Implementation costs, including split by capital and operating expense	An estimate for start-up and establishment costs will be calculated in the model, using overseas examples. Note that these establishment costs will include operational establishment costs only and will exclude regulatory and legislative establishment costs.
Operating costs	This is based on the implementation and operating costs of the Nottingham City Council scheme.
Bad debt estimate	Data from overseas examples will be utilised to estimate a bad debt provision for the levy. We will also use information from the WCC parking team to estimate bad debt on parking, although we note that parking fines and the levy will not be directly comparable.

7.6.9 Modelling assumptions

The key modelling assumptions underpinning the model are summarised below. A full list of assumptions is provided in **Appendix 7.1**.

- Extent of levy pass-through from car park operators/owners to commuters. (Discussed in **Section 7.5**).
- Price elasticity of commuter parking demand. (Discussed in **Section 7.5**).
- Displacement of commuters to parking areas outside the levy catchment area. We assume that of the commuters who, due to the levy, decide to no longer park in the CBD, 7% of these decide to park in an area outside the levy boundary and walk to their workplace (this is similar to the Stated Preference Survey findings ranging from 5.9% to 8%).
- Car park supply response to reduction in demand. (Discussed in **Section 7.5**). We assume that parking supply contracts in line with reduction in demand, so that occupancy rates remain constant over time at the present occupancy level. We assume there is no lag in the supply response. So, if demand decreases by 5% in a given year, supply also decreases by 5% in that year. This appears reasonable based on the evidence from Nottingham – the number of liable Workplace Parking Places decreased from 26,917 to 25,308 following the first year of the levy's introduction.
- The proportion of short-stay car parks in off-street public car park facilities (which affects the estimated number of commuter car parks captured by the levy). We have estimated 25% are casual short-stay parks.
- We assume that investment in public transport capacity is sufficient to cope with the additional demand for public transport resulting from the parking levy. This is part of the reason for suggesting that the introduction of the levy is not until 2025.
- We have applied an upward adjustment factor of 5% to the WTSM model trip volumes to calibrate the volumes to the Wellington cordon survey and to allow for trips made before 7am and between 9am and 10am.

The model outputs are most sensitive to the levy passthrough and elasticity of demand assumptions. These are explained further in **Section 8**.

7.7 Discussion of key model elements

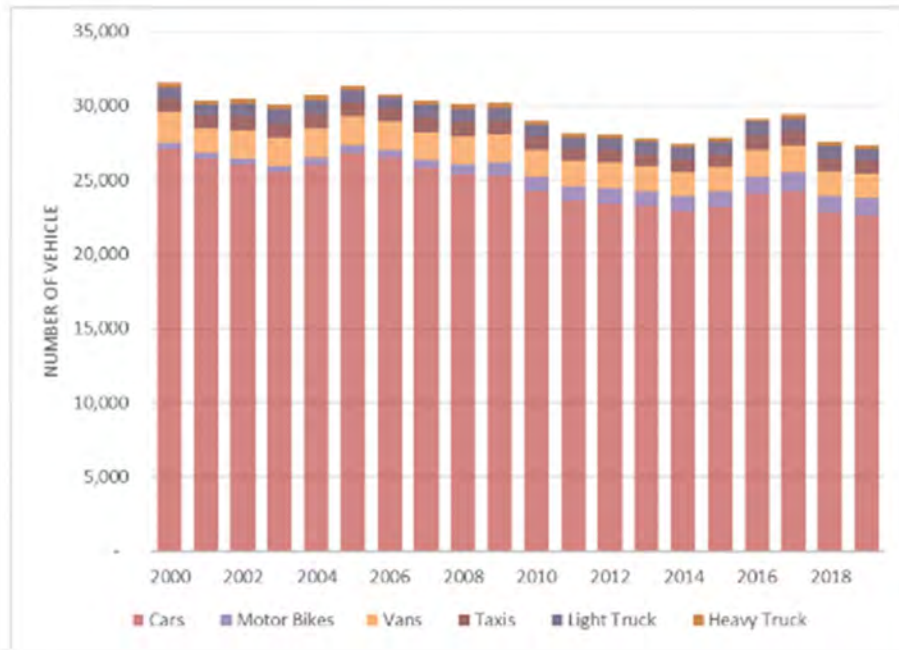
7.7.1 Background

In this section we discuss the key elements in the financial model, and explain the approach taken to incorporating these in the model.

7.7.2 Current and forecast demand.

The Wellington CBD cordon survey estimates 22,570 cars entered the CBD cordon in 2019 during the two-hour morning peak between 7am and 9am. This includes commuters, through-traffic and taxis/ubers. The number of cars entering the CBD has fallen over the past 20 years (a total decrease of -16.7%) though has been relatively flat over the last 5 years (a total decrease of 2.4%) (see **Figure 7.2** below).

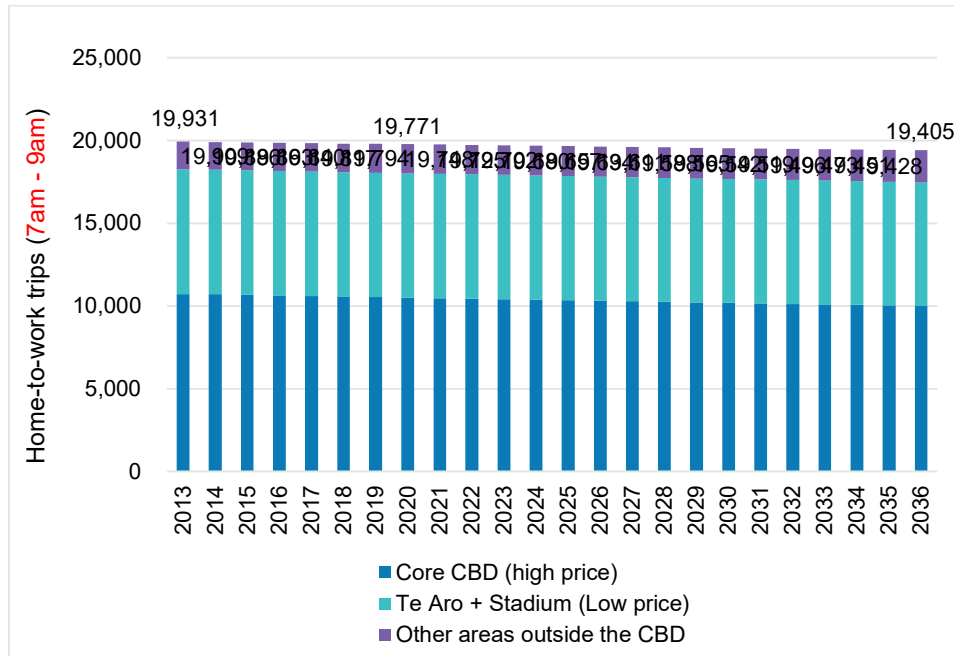
Figure 7.2 Motor vehicles crossing the CBD cordon at morning peak (7am-9am)



Source: Greater Wellington Regional Council CBD Cordon survey report, 2019.

This aligns relatively well with the WTSM model, which estimates 19,771 home-to-work car trips in 2020. Comparing this with the CBD cordon survey suggests approximately 88% of cars entering the CBD cordon are commuters (either parking in the CBD or parking in other areas). Of the 19,771 home-to-work car trips in 2020, WTSM estimates 18,016 parked in the CBD and 1,755 parked in other areas outside the CBD (see **Table 7.7Table** below). The WTSM model forecasts that, in the absence of a parking levy, the total number of home-to-work car trips will fall to 19,405 by 2036 (-0.1% per year), with 17,473 of those trips being to the CBD. The WTSM model has a base year of 2013 and a forecast year of 2036, so we have assumed a linear interpolation between 2013 and 2036 in the financial model – see **Figure 7.3** below:

Figure 7.3 Current and forecast home-to-work trips, without levy.



Source: Based on WTSM model. Adjusted upward to calibrate with the Wellington cordon survey and allow for trips outside of the time period modelled in WTSM.

Table 7.7 Current and forecast commuter parking demand, without levy (WTSM model)

Origin	Destination zone	Parking	Home-work car trips	
			2020	2036
Miramar / Kilbirnie / East	Core CBD		950	793
	Te Aro + Stadium		976	864
	Other (not levied)		230	225
Subtotal			2,156	1,882
Newtown / Island Bay / Berhampore / Brooklyn	Core CBD		1,405	1,349
	Te Aro + Stadium		1,400	1,454
	Other (not levied)		334	379
Subtotal			3,140	3,181
Karori	Core CBD		1,188	1,040
	Te Aro + Stadium		722	655
	Other (not levied)		222	238
Subtotal			2,133	1,933
Khandallah, Ngaio	Core CBD		992	834
	Te Aro + Stadium		605	526
	Other (not levied)		133	135
Subtotal			1,730	1,495
JVL, Hutt Valley, Northern suburbs, rest of region	Core CBD		4,845	4,635
	Te Aro + Stadium		2,810	2,746
	Other (not levied)		556	605
Subtotal			8,210	7,986
CBD	Core CBD		1,127	1,347
	Te Aro + Stadium		995	1,231

	Other (not levied)	278	350
Subtotal		2,401	2,927
All	Core CBD	10,507	9,998
	Te Aro + Stadium	7,509	7,475
	Subtotal (CBD)	18,016	17,473
	Other (not levied)	1,755	1,932
All	Total	19,771	19,405

Source: WTSM model.

Note: The WTSM model overstates internal CBD trips (CBD to CBD). Census Journey to Work data suggests there should be around 700 home-work trips within the CBD, rather than 2,401. However, we have not adjusted this information in the model as this demand likely occurs – just from different origin zones. At the moment, this does not affect the aggregate levy modelling results because the total home-work trips in the WTSM model are accurate and the demand elasticities applied currently in the model are identical for all trip-origin areas.

7.7.3 Current car park supply and price.

Supply

The current supply of car parks in Wellington’s CBD was determined based on Wellington City Council’s Rating Information Database and RCG’s commercial car park inventory analysis.

There are approximately 27,660 car parks in total in the CBD. Subtracting retail and residential parks which will not be captured by the levy, there are 22,050 commuter or casual (short stay) parks. We estimate that there are currently about 19,527 long-stay parks available for commuters (this is based on an estimate of the number of off-street casual (short-stay) parks, which is not known with certainty).

The car parks were split into categories as shown in **Table 7.8**, allowing various car park categories to be included or excluded from the levy in the financial model. The base case levy scheme design assumes all publicly available off-street commuter parks are levied and private car parks with 11 or more parks are levied.

Currently, there are approximately 17,052 car parks in the “11 and over” category and 2,475 car parks that would be exempt from the levy being part of a group of 10 or fewer parks.

Table 7.8 Current car park supply, 2020

Category	Type of car park		Number of car parks, 2020		
			Core CBD zone	Te Aro + Stadium	Total
Off-street available to public: Operator run	Commuter		4,190	2,802	6,992
	Casual (short-stay)		1,397	934	2,331
	Total		5,587	3,736	9,323
Off-street available to public: Council-operated	Commuter		424	155	578
	Casual (short-stay)		141	52	193
	Total		565	206	771
Off-street private not available to public	Commercial offices	11+ parks	5,194	3,062	8,256
		10 or fewer parks	1,487	877	2,364
		Total	6,681	3,939	10,620
	Government entities	11+ parks	200	50	250
		10 or fewer parks	0	0	0
		Total	200	50	250
	Foreign embassies	11+ parks	128	0	128
		10 or fewer parks	19	0	19
		Total	147	0	147
	Educational	11+ parks	35	0	35
		10 or fewer parks	15	13	28
		Total	50	13	63
	Not for profit organisations	11+ parks	441	341	782
		10 or fewer parks	10	36	46
		Total	451	377	828
	Health services	11+ parks	30	0	30
		10 or fewer parks	10	8	18
		Total	40	8	48
	Total commuter parks	11+ parks	10,642	6,410	17,052
		10 or fewer parks	1,541	934	2,475
		TOTAL	12,183	7,344	19,527
Total casual (short-stay) parks			1,538	986	2,524
Commuter + Casual CBD car parks			22,050		
Retail			516	765	1,281
Residential			2,213	2,116	4,329
Total CBD car parks			27,660		

Source: Wellington City Council Rating Information Database and RCG car park inventory.

Parking prices

Current average parking prices in each CBD zone are given in **Table 7.9**. These prices were calculated as a weighted average based on early-bird parking prices in public car parks. The average daily early-bird prices were multiplied by 250 business-days per year to calculate the yearly average price. Early-bird prices were used as a proxy for average prices as there is little difference between daily early-bird prices and monthly unreserved prices. Commuters that pay for reserved parks on the monthly or annual basis are a small proportion of total commuters so do not have a large impact on the weighted average.

Table 7.9 Current weighted average parking prices

Location	Daily Price	Annual Price (250 days)
Core CBD (high price zone)	\$20.64	\$5,160
Te Aro + Stadium (low price zone)	\$14.04	\$3,510

Source: Calculations based on RCG car park inventory

7.7.4 Response of car park suppliers to a levy

Extent of levy pass-through to the commuter

In the first instance, the change in supply volume is likely to be directly related to maintaining a level of occupancy and revenue coverage for operator-owned carparks. For example, public carpark operators could increase the number of casual commuter car-parking available in their car parking facilities.

The supply of carparks is adjusted presuming that the overall occupancy of commuter carparks will remain close to current levels. Privately owned carparks are likely to have a smaller supply-side response, as alternative uses for these carparks will not be readily available (at least in the short-term).

For privately owned carparks, we have modelled these supply-side impacts using information from Nottingham City Council following the introduction of their workplace parking levy scheme.

There are a number of other variables that we have not directly accounted for in the model, but could occur (on balance, we consider that the likelihood of these occurring is not high, given information we have reviewed from other jurisdictions and our external stakeholder meetings):

- The possibility that public carpark operators could seek to recover the costs of the levy not through increasing the costs of parking in Wellington alone, but by spreading the cost across their national operations instead. All of the public car park operators in Wellington CBD have said they will pass on the cost of the levy to people parking in their CBD car parks. Our review of literature and information would appear to indicate that this is not a common occurrence, and on balance, we consider that the likelihood of it occurring is reasonably low.

Table 7.10 summarises the Levy pass through assumptions.

Table 7.10 Levy passthrough assumptions in the model

Type	Pass-through assumptions
Public operator-run car parks	60% - 80%
Private office building car parks	50%

7.7.5 Demand response to a levy

Price elasticity of demand for commuter parking

As commuter parking becomes more expensive, a smaller number of spaces will be 'demanded'. The relationship between price and quantity demanded is called elasticity, as discussed in more detail in **section 8.2**.

We have modelled the elasticity of demand utilising the following formula:

Price elasticity of demand =

$$\frac{d_2}{d_1} = \left(\frac{p_2}{p_1}\right)^\epsilon \Rightarrow d_2 = d_1 \left(\frac{p_2}{p_1}\right)^\epsilon$$

This approach accounts for the change in demand dependent on the starting price and the relative value of the price change compared to the starting price.

We have included three scenarios for demand elasticity in the accompanying financial model, on the basis of a review of literature and the results from our stated preference survey:

Varying elasticities by commuter origin

By pairing trip start and trip destination in the model, we are able to tailor the demand elasticity based on suburb of trip origin (which could be influenced by median income level, availability of public transport alternatives, price of public transport alternatives etc). On the basis of stated preference survey results, we have updated the demand elasticities for trip types, on the basis of GO Origin sectors. **Table 7.11** below summarises the stated preference demand elasticity results by GO Origin Sector.

Table 7.11 Demand elasticities by GO Origin Sector

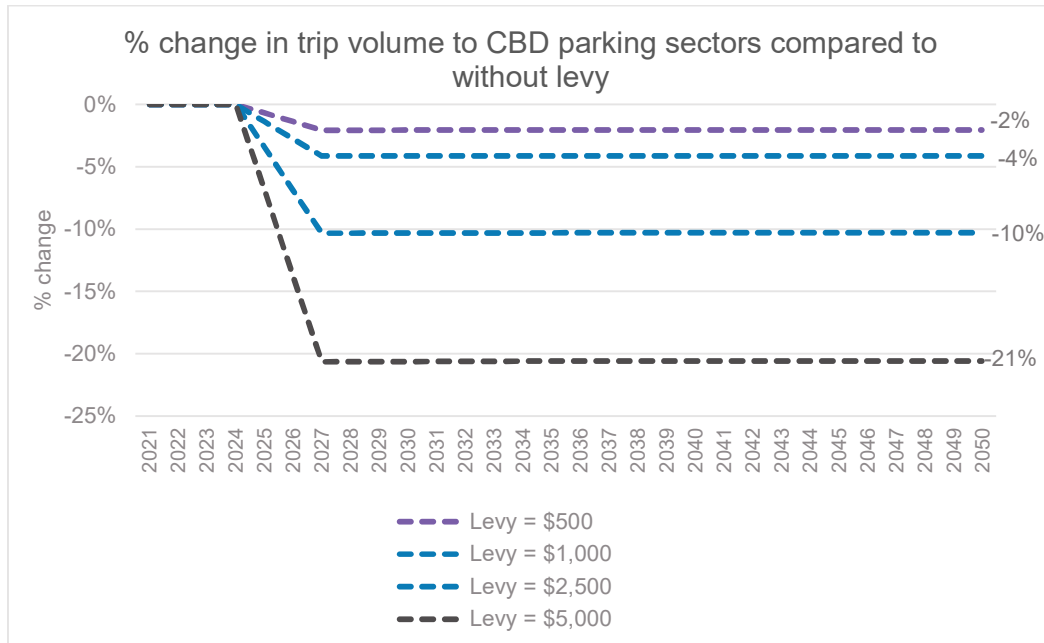
	Conservative	Base	Optimistic
JVL, Hutt Valley, Northern suburbs, rest of region	-0.38	-0.44	-0.67
Khandallah, Ngaio	-0.37	-0.51	-0.75
Karori	-0.47	-0.55	-0.88
Newtown / Island Bay / Berhampore / Brooklyn	-0.36	-0.43	-0.61
Miramar / Kilbirnie / East	-0.23	-0.38	-0.73
CBD	-0.23	-0.39	-0.59

7.8 Impacts of Wellington Commuter Parking Levy

7.8.1 Mode shift impacts

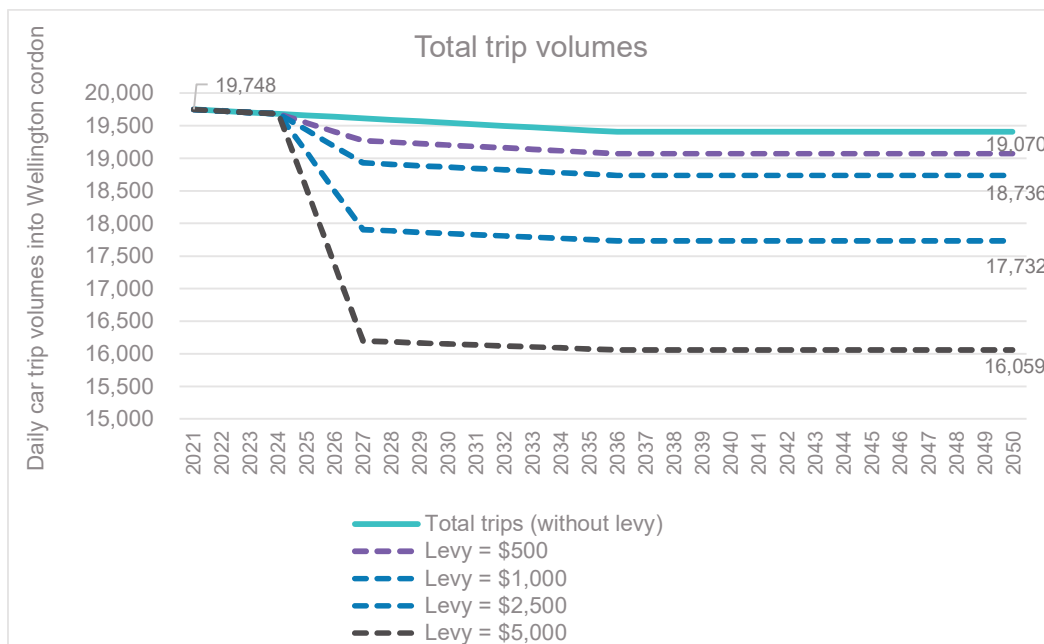
Our modelling indicates that depending on the level of the levy set, there would be between a 2% (\$500 annual levy) and 21% (\$5,000 annual levy) reduction in car trips to the CBD compared to an environment where a parking levy was not introduced. A summary of these shifts is included in **Figure 7.4** below:

Figure 7.4: Percentage change in trip volumes to CBD following introduction of the levy.



The modelling also indicates that the total reduction in car trips as a result of the introduction of the levy would be slightly lower than the figures indicated above – this is because a certain proportion of commuters are estimated to displace their destination from the CBD to outside the leviable CBD area. The change in total trip volumes estimated as a result of the levy are included in Figure 7.5, below:

Figure 7.5: Total change in trip volumes by car as a result of different levy levels



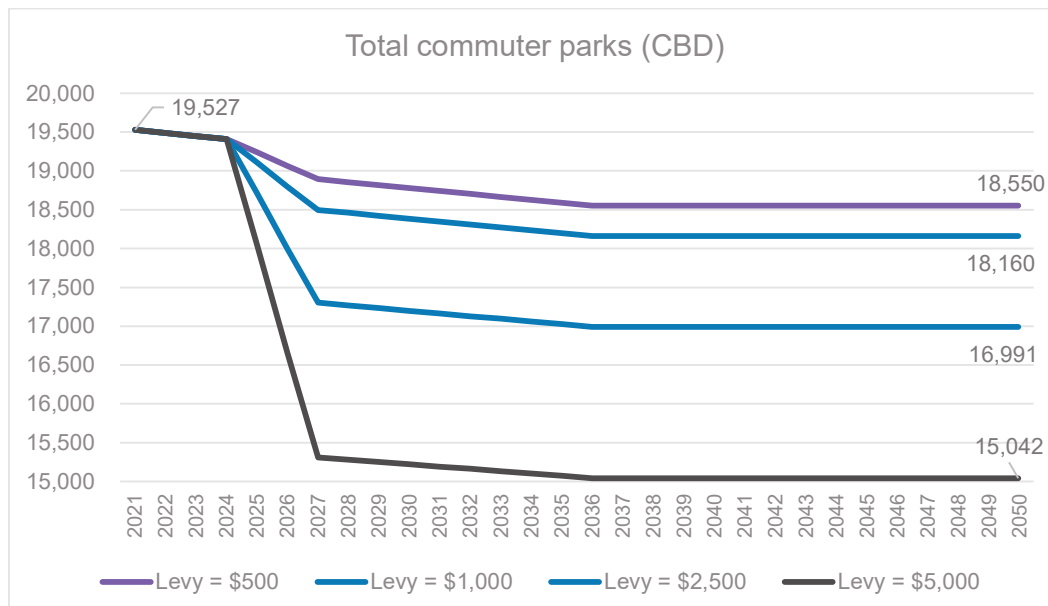
This means that independent of any other factors, the introduction of a parking levy of \$2,500 alone would be expected to reduce the total volume of car trips from 19,748 to 17,732, a reduction of 2,016 (10.2%)

car trips to Wellington CBD each weekday with the mode shifts ranging from 3% with a \$500 charge to 18.6% with a \$5,000 charge.

7.8.2 Parking supply impacts

Because the introduction of the levy would lead to a reduction in demand, we also anticipate that there would be a reduction in carpark supply over the period of time in which the levy was in force, as carpark operators transitioned commuter carparks to other uses (such as casual car parks) or removed them from the market. **Figure 7.6** summarises the estimated reduction in the number of carparks provided within the leviable area, compared to the status quo:

Figure 7.6: Change in parking supply in the CBD as a result of different levies.



7.8.3 Other impacts estimated in the model.

There are other impacts associated with the introduction of the levy associated with carparking – some of which we have modelled at this stage; others, which, at this stage, are more difficult to model but could eventuate. We discuss these items, below.

Displacement of carparking to areas outside of the levy boundary

The model estimates that a certain proportion of commuters would, instead of paying the levy, displace to areas immediately adjacent to the levy boundary. We have not yet modelled the specific locations of this displacement (as this could require this model to be calibrated to AIMSUN, the other transport modelling tool utilised by the programme team), but we estimate that, under Scenario 3, up to 128 commuters would displace their parking to areas outside of the leviable zone (and this could be lower still if CBD Coupon parking and 10-hour max meter parking charges are increased). This is shown in **Table 7.12** below.

Given current parking rules, we would anticipate that the majority of these commuters would displace to coupon parking zones or public carparks that would be just outside the leviable boundary.

Table 7.12: Displacement estimates from introduction of levy.

Displacement to adjacent non-levy zones

				2025	2026	2027	2028	2029	2030
Origin		Destination Parking Sector							
Code	Sector								
CBD	go01	Other	Displacement from high-price zone	2	5	8	8	8	8
			Displacement from low-price zone	2	5	7	7	7	7
		Sub-total displacement	5	10	15	15	15	15	
Miramar / Kibimie / East	go02	Other	Displacement from high-price zone	2	4	5	5	5	5
			Displacement from low-price zone	2	4	6	6	6	6
		Sub-total displacement	4	8	11	11	11	11	
Newtown / Island Bay / Berhampore / Brooklyn	go03	Other	Displacement from high-price zone	3	6	10	10	10	9
			Displacement from low-price zone	3	7	10	10	10	10
		Sub-total displacement	7	13	20	20	20	20	
Karori	go04	Other	Displacement from high-price zone	3	7	10	10	10	10
			Displacement from low-price zone	2	4	6	6	6	6
		Sub-total displacement	5	11	16	16	16	16	
Khandallah, Ngaio	go05	Other	Displacement from high-price zone	3	5	8	7	7	7
			Displacement from low-price zone	2	3	5	5	5	5
		Sub-total displacement	4	8	12	12	12	12	
JVL, Hutt Valley, Northern suburbs, rest of region	go06	Other	Displacement from high-price zone	11	23	34	34	33	33
			Displacement from low-price zone	7	14	20	20	20	20
		Sub-total displacement	18	36	54	54	54	54	
Total		Other	Displacement from high-price zone	25	50	74	74	73	73
			Displacement from low-price zone	18	37	55	55	55	55
		TOTAL DISPLACEMENT	43	86	129	128	128	128	

The Financial Modelling has not taken into account any increased revenue from pricing changes to CBD Coupon or 10-hour max meter parking spaces.

Other potential issues that need to be considered

There are a range of other potential consequences and issues that would need to be worked through, if the proposed levy scope were to be adopted. These include, but are not limited to:

- As residential carparking spaces are outside the scope of the levy, there is a possibility that residents would seek to lease their carparking spaces to commuters (this happens to some degree today already). With the introduction of the levy, residential carparking owners in the CBD would have an arbitrage opportunity to sub-lease their carparks, undercut the market, and not have these parking spaces liable for the levy.
- With the exclusion of carparks with 10 or fewer spaces, a levy at a high enough level may make it more economic for some commuters to consider purchasing carparking spaces outright. This would mean that they would no longer be liable for the levy, as the 'owner' of the carpark would have 10 or fewer car parking spaces. This scenario would be particularly attractive and a likely market response if the levy level were set too high. Carpark operators could simply sell off their carparks to commuters, and these carparks would then not be subject to a levy.
- As discussed elsewhere in this report, there are two important tax pass-through implications and the demand response. The first is with regards to GST. A private business owner who is a commuter would be able to claim back the GST component of the levy in many instances as a cost of doing business, meaning that the 'actual' cost of the levy was 15% less for this commuter compared to others who were not able to claim back GST (ie, PAYE employees).
- The second inconsistency is with regards to fringe benefit tax and carparking. The current interpretation of fringe-benefit tax law and employer-provided carparking spaces is that fringe benefit tax is effectively not charged on employer-provided carparks. This reduces the actual cost of parking for commuters who are provided with an employer-provided carpark, and carparking is advantaged in fringe-benefit tax compared to public transport and active transport mode subsidies (which, somewhat ironically, do attract fringe benefit tax).

7.9 Revenue and costs

7.9.1 Implementation Costs

We have also estimated up-front establishment and implementation costs for the possible parking levy, and annual operating costs.

The majority of these estimates are derived from representative information that we have been provided by Nottingham City Council, who provided us with detailed copies of the Financial and Commercial Cases for their workplace parking levy implementation scheme.¹¹

A summary of the implementation costs that Nottingham City Council provided us are included in **Table 7.13** below. Their model included estimates for scheme development and development of a business case, public consultation and approval processes, and implementation and operation of the scheme.

They also provided low, medium and high estimates for implementation costs, and suggested the timing of these costs depending on the introduction of the levy.

Table 7.13 - Nottingham workplace Parking Levy Implementation Costs

Nottingham City Council Establishment cost estimates			
British £, 2009£	Low	Mid	High
1. Scheme development > Outline business case			
Supporting studies/information	100,000	200,000	300,000
Measures and monitoring	100,000	175,000	250,000
Modelling	100,000	200,000	300,000
Levy scheme development	120,000	185,000	250,000
Levy-funded project package	100,000	150,000	200,000
Project management	100,000	175,000	250,000
Subtotal	620,000	1,085,000	1,550,000
2. Public consultation > Approval			
Public consultation preparation	80,000	140,000	200,000
Public consultation	100,000	200,000	300,000
Parking levy approval	120,000	185,000	250,000
Levy scheme development	80,000	115,000	150,000
Project management	100,000	175,000	250,000
Subtotal	480,000	815,000	1,150,000
3. Implementation > Operation			
Levy implementation	425,000	450,000	475,000
Scheme goes live	175,000	200,000	225,000
Levy charging commences	0	0	0
Project management	100,000	150,000	200,000
Subtotal	700,000	800,000	900,000
Total establishment cost	1,800,000	2,700,000	3,600,000

These implementation costs were provided in 2009 GBP, and we have inflated them to 2020 GBP, and then converted to NZD at the prevailing NZD/GBP conversion rate as of 14 October 2020 (1 GBP – 1.96 NZD). The midpoint estimate has been used to estimate implementation costs.

¹¹ Her Majesty's Government and the New Zealand Government both use the same 5-case business case model and framework; the New Zealand framework was largely adopted from HM Treasury guidance

We then sequenced these costs according to the year of the levy introduction, resulting in implementation costs as shown in **Table 7.14**:

Table 7.14: Wellington Commuter Parking Levy estimated Implementation Costs.

Wellington Parking Levy Establishment cost estimates				
<ul style="list-style-type: none"> • Midpoint above is used in Wellington levy establishment cost estimates. • Nottingham City Council costs have been inflated to 2020\$ (from 2009\$) 				
NZ\$, inflated to 2020\$	Levy year 1			Total
	2024	2025	2026	
Public consultation > Approval				
Public consultation preparation	325,733			
Public consultation	465,333			
Parking levy approval	430,433			
Levy scheme development	267,567			
Project management (A)	407,167			
Subtotal	1,896,233	0	0	
Implementation > Operation				
Levy implementation		1,047,000		
Scheme goes live			465,333	
Levy charging commences	0	0	0	
Project management (B)		174,500	174,500	
Subtotal	0	1,221,500	639,833	
Total establishment cost	1,896,233	1,221,500	639,833	\$3,757,567

All of the costs are provided in financial years, with the 2024 period representing the financial year ending 30 June 2024.

All of the implementation costs have currently been estimated as operating expense, rather than capital costs, as the only potential for capital costs may be related to building or developing associated with ICT expenditure to support operations of the levy, and it can largely be expected that these functions could be procured on an as-a-service basis, meaning that the capital costs are minimal.

7.9.2 Operating Costs

Early on in our review of levy information, Nottingham City Council also provided us with a rough rule of thumb associated with operation of any parking levy scheme – that it is circa 5% of the levy revenue collected. Following this, Nottingham City Council also provided us with a detailed breakdown of their operating costs for running and operating their workplace parking levy scheme. A summary of these costs for the Wellington Commuter Parking Levy are included in **Table 7.15** below:

Table 7.15 - Wellington Commuter Parking Levy estimated Operating Costs.

Opex contingency 10%

Operating costs (NZ\$, inflated to 2020\$)	Levy year 1			
	2026	2027	2028	Outyears
Parking levy team salaries	\$828,158	\$754,296	\$754,296	\$754,296
IT costs	\$151,224	\$151,224	\$151,224	\$151,224
Equipment	\$69,800	\$69,800	\$69,800	\$69,800
Consultant support	\$232,667	\$232,667	\$232,667	\$232,667
Legal services contingency	\$100,000	\$0	\$0	\$0
Subtotal	\$1,381,849	\$1,207,987	\$1,207,987	\$1,207,987
Contingency (10%)	\$138,185	\$120,799	\$120,799	\$120,799
Total opex	\$1,520,034	\$1,328,785	\$1,328,785	\$1,328,785

The information indicates, and the model allows for, operating costs of up to \$1.520m in the first year of levy introduction, reducing slightly to \$1.328m in FY 27 and the following years.

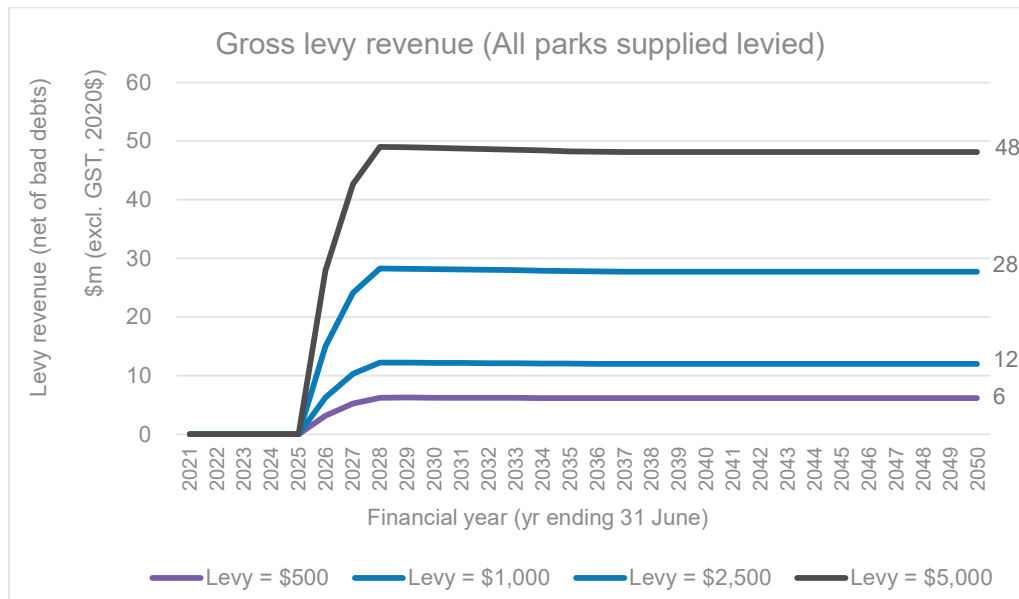
In addition to these operating costs, the financial model also accounts for an additional operating cost: an allowance for bad debts from the levy collection. This is conservatively estimated at 1% of all revenue associated with the levy; our analysis from the Nottingham scheme indicates that this may be too high, but we have used this level as it is consistent with the bad debt estimates for other parking fees across Wellington City Council.

7.9.3 Revenue

As previously mentioned, four levy scenarios are included within the financial model. Each Scenario has independent output sheets, outlining the number of carparks that are in-scope of the levy. Within the financial model, there are also gross and net revenue calculations and outputs. Gross revenue is the amount of levy revenue collected against the in-scope carparks that we estimate would be captured by the levy.

A summary of these gross revenue figures for the four levy scenarios are included in **Figure 7.7**, below.

Figure 7.7: Gross levy revenue calculation for the four levy scenarios



As can be seen from **Figure 7.9**, a levy set at \$2,500 per annum (and \$1,750 per annum in low-price zones) would generate up to \$28m in gross levy revenue per annum.

A summary of the total number of carparks that would be subject to the levy are included in **Table 7.16** below:

Table 7.16: Carparks liable for the levy according to recommended implementation approach, by high price and low-price sectors

Carparks	2025	2026	2027	2028	2029	2030
High-price zone	9,965	9,371	8,798	8,770	8,743	8,716
Low-price zone	6,057	5,700	5,353	5,352	5,350	5,349
Total carparks levied	16,022	15,071	14,151	14,122	14,093	14,064

Cashflow projections are presented for each of the four levy models included within the financial model. These cashflow projections include the gross revenue calculation, and a net revenue calculation, accounting for the operating and establishment costs outlined above, plus an allowance for bad debts associated with levy revenue (currently estimated at 1% per annum).

As previously mentioned, all costs are assumed as operating costs, rather than capex costs.

There are also additional changes to the revenue estimates from the levy calculation, and some important callouts, which are outlined below:

- Revenue and cost figures are presented in financial years, rather than calendar years. Because travel information from WTSM and the cordon survey is presented in calendar years, we have to make an assumption about travel patterns across a year. The modelling largely excludes the effect of any seasonality; that is, we have not applied any seasonality adjustments to the travel data when translating it to financial years.
- Revenue is calculated as **exclusive of GST** – the amount of the levy charged is **inclusive of GST**, as this is the amount that commuters would be expected to pay, as it is presumed that the levy would attract GST.
- There is a separate line item in the cashflow forecast which calls out levy revenue that is collected from council-owned or operated carparks. Depending on how the council and Waka Kōtahi/NZTA would like to account for this, it may need to be removed from any cash forecasting.

A presentation of the cash flow projection for Levy Scenario 3 (\$2,500 per annum), net of operating costs and establishment costs, is included below:



Cashflow Projection for Levy Scenario 3 (\$2,500 per annum), from Financial Model

Levy revenue - CALENDAR YEARS																
REVENUE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Levy revenue																
High price CBD sector	0	0	0	0	7,249,316	14,063,823	20,046,837	19,985,682	19,924,526	19,863,370	19,802,214	19,741,058	19,679,903	19,618,747	19,557,591	19,496,435
Low price CBD sector	0	0	0	0	3,088,139	6,002,942	8,573,375	8,571,330	8,569,285	8,567,240	8,565,195	8,563,150	8,561,105	8,559,060	8,557,015	8,554,970
Total gross revenue	0	0	0	0	10,337,455	20,066,765	28,620,213	28,557,012	28,493,811	28,430,610	28,367,409	28,304,209	28,241,008	28,177,807	28,114,606	28,051,405
Less: Allowance for bad debts	0	0	0	0	(103,375)	(200,668)	(286,202)	(285,570)	(284,938)	(284,306)	(283,674)	(283,042)	(282,410)	(281,778)	(281,146)	(280,514)
Levy revenue (net of bad debts)	0	0	0	0	10,234,080	19,866,098	28,334,011	28,271,442	28,208,873	28,146,304	28,083,735	28,021,166	27,958,598	27,896,029	27,833,460	27,770,891
Less: Levy paid by Council-operated car parks																
High price CBD sector	0	0	0	0	287,445	555,018	787,172	784,775	782,378	779,980	777,583	775,186	772,789	770,392	767,995	765,598
Low price CBD sector	0	0	0	0	74,137	143,457	203,893	203,846	203,798	203,751	203,703	203,656	203,608	203,561	203,513	203,466
Total paid by Council-operated car parks	0	0	0	0	361,582	698,475	991,065	988,620	986,176	983,731	981,287	978,842	976,397	973,953	971,508	969,064
Levy revenue (net of bad debts, and levy paid by Council-operated parks)	0	0	0	0	9,872,498	19,167,623	27,342,946	27,282,821	27,222,697	27,162,573	27,102,449	27,042,324	26,982,200	26,922,076	26,861,952	26,801,827

Levy revenue - FINANCIAL YEARS																
REVENUE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Levy revenue																
High price CBD sector	0	0	0	0	0	10,656,570	17,055,330	20,016,260	19,955,104	19,893,948	19,832,792	19,771,636	19,710,480	19,649,325	19,588,169	19,527,013
Low price CBD sector	0	0	0	0	0	4,545,540	7,288,159	8,572,353	8,570,308	8,568,263	8,566,218	8,564,173	8,562,128	8,560,083	8,558,038	8,555,993
Total gross revenue	0	0	0	0	0	15,202,110	24,343,489	28,588,613	28,525,412	28,462,211	28,399,010	28,335,809	28,272,608	28,209,407	28,146,206	28,083,006
Less: Allowance for bad debts	0	0	0	0	0	(152,021)	(243,435)	(285,886)	(285,254)	(284,622)	(283,990)	(283,358)	(282,726)	(282,094)	(281,462)	(280,830)
Levy revenue (net of bad debts)	0	0	0	0	0	15,050,089	24,100,054	28,302,726	28,240,157	28,177,588	28,115,020	28,052,451	27,989,882	27,927,313	27,864,744	27,802,176
Less: Levy paid by Council-operated car parks																
High price CBD sector	0	0	0	0	0	421,231	671,095	785,973	783,576	781,179	778,782	776,385	773,988	771,591	769,194	766,797
Low price CBD sector	0	0	0	0	0	108,797	173,675	203,870	203,822	203,774	203,727	203,679	203,632	203,584	203,537	203,489
Total paid by Council-operated car parks	0	0	0	0	0	530,028	844,770	989,843	987,398	984,953	982,509	980,064	977,620	975,175	972,731	970,286
Levy revenue (net of bad debts, and levy paid by Council-operated parks)	0	0	0	0	0	14,520,061	23,255,284	27,312,884	27,252,759	27,192,635	27,132,511	27,072,387	27,012,262	26,952,138	26,892,014	26,831,890

ESTABLISHMENT COSTS																
ESTABLISHMENT COSTS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Public consultation > Approval																
Public consultation preparation	0	0	0	325,733	0	0	0	0	0	0	0	0	0	0	0	0
Public consultation	0	0	0	465,333	0	0	0	0	0	0	0	0	0	0	0	0
Parking levy approval	0	0	0	430,433	0	0	0	0	0	0	0	0	0	0	0	0
Levy scheme development	0	0	0	267,567	0	0	0	0	0	0	0	0	0	0	0	0
Project management (A)	0	0	0	407,167	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	1,896,233	0	0	0	0	0	0	0	0	0	0	0	0
Implementation > Operation																
Levy implementation	0	0	0	0	1,047,000	0	0	0	0	0	0	0	0	0	0	0
Scheme goes live	0	0	0	0	0	465,333	0	0	0	0	0	0	0	0	0	0
Levy charging commences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project management (B)	0	0	0	0	174,500	174,500	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	1,221,500	639,833	0	0	0	0	0	0	0	0	0	0
Total establishment costs	0	0	0	1,896,233	1,221,500	639,833	0	0	0	0	0	0	0	0	0	0
OPERATING COSTS																
Parking levy team salaries	0	0	0	0	0	828,158	754,296	754,296	754,296	754,296	754,296	754,296	754,296	754,296	754,296	754,296
IT costs	0	0	0	0	0	151,224	151,224	151,224	151,224	151,224	151,224	151,224	151,224	151,224	151,224	151,224
Equipment	0	0	0	0	0	69,800	69,800	69,800	69,800	69,800	69,800	69,800	69,800	69,800	69,800	69,800
Consultant support	0	0	0	0	0	232,667	232,667	232,667	232,667	232,667	232,667	232,667	232,667	232,667	232,667	232,667
Legal services contingency	0	0	0	0	0	100,000	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	0	1,381,849	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987	1,207,987
Contingency (10%)	0	0	0	0	0	138,185	120,799	120,799	120,799	120,799	120,799	120,799	120,799	120,799	120,799	120,799
Total operating costs	0	0	0	0	0	1,520,034	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785	1,328,785
NET REVENUE	0	0	0	(1,896,233)	(1,221,500)	12,360,193	21,926,499	25,984,088	25,923,974	25,863,850	25,803,725	25,743,601	25,683,477	25,623,353	25,563,228	25,503,104

7.9.4 Key financial modelling information

- The financial model runs out to 2050; however, as WTSM information is only available until 2036, transport demand information is only included until 2036 in the levy model, and then the information remains static until 2050. For this reason, we suggest that the evaluation period should be until 2036, which represents a life of circa 15 years for the levy (including establishment time period and costs).
- All information presented in the financial model is non-discounted, non-inflated, and presented solely in 2020 dollars.
- As discussed, the levy calculation which drives demand reductions is calculated **inclusive of GST**. The revenue calculations are **exclusive of GST**. This means that a \$2,500 annual levy generates \$2,174 of gross revenue per leviable carpark.
- As previously discussed, the modelling uses a two-category levy area: a 100% levy rate applied to the high-price parking zones, and a 70% levy rate applied to the low-price parking zones in the CBD.
- Carparks with 10 or fewer spaces are not captured in the scope of the levy; this can be adjusted in the model.
- The reduction in levy revenue indicated in the model is a result of the supply response as a levy is introduced – over time, we anticipate that the total number of leviable carparks would decrease as demand for travel by car reduces. This is why there is a slight reduction in the gross and net revenue calculations over the years in the model.
- A contingency of 10% to operating costs has been added to the operating cost estimates.
- As previously mentioned, all operating, and establishment costs are assumed to be opex; we anticipate that there would be limited capex investment requirements for implementation of the levy.
- The assumed pass-through of the levy is calculated as at least 60% for public carparks and 50% for private/business carparks. This is based on information on the amount of the levy that was passed through to commuters in other jurisdictions following a levy introduction, and the difference in the public carpark and private/business level is due to the fact that public carparks will have a greater opportunity to transition some carparks to casual carparks, and the treatment of carparking according to fringe benefit tax laws in New Zealand means that for those private/business carparks which are being provided as a fringe benefit, the full taxation cost of the levy is not passed through to the commuter (see **Section 9**.)
- A full copy of the financial model, scenarios, and specification document for the financial model has also been provided to the *LGWM Programme Team*.

7.10 Risk and uncertainties

The main risks that would affect both the potential reduction in demand and revenue estimates included in the financial model are identified below:

For demand reduction:

- The extent to which commuter demand continues to remain flat or decline slightly. Transport modelling and forecasting up until 2020 has shown that the volume of cars entering the CBD has remained static or declined slightly, despite employment in the CBD increasing.
- The ease in which commuters can transition to public or active transport modes. If there is not readily available public or active transport modes for a car commuter to substitute to, the only alternative may be to simply pay the increase in levy and drive. This is why we propose that the levy is not introduced until at least 2025, as this timing aligns with some of the initial planned public transport and active mode improvements as part of the Let's Get Wellington Moving Programme.
- The extent to which certain commuters are driving because of other factors, such as intermediate stops eg school or day-care drop offs (which the Stated Preference survey indicated this represents circa 15% of CBD commuters), or health and safety considerations (such as a desire to remain away from public transport during the COVID-19 pandemic).

- The pass-through of the levy. As discussed previously, with a parking levy being charged to occupiers/operators of carparks, the full cost of the levy is unlikely may not be fully passed through to commuters, judging from evidence in other jurisdictions. Our estimate is that 60% of the cost of the levy will be passed through to commuters – we also test a sensitivity where at least 80% of the levy is passed through to commuters.

For revenue and costs:

- The extent to which there are unintended market movements (such as towards individual ownership and purchase or carparks by commuters, rather than use) which could further reduce the supply of leviable carparks.
- The estimated supply response of carpark operators. The model currently presumes that some carpark operators would transition some long-stay commuter carparks to casual carparks, leading to a reduction in the overall supply of commuter carparks.
- The extent to which operators would attempt to circumvent the levy by reducing the number of carparks that they offered to 10 or fewer. Our indications in the review of carpark supply is that there are only a small proportion of carparks that are between 11 and 20 (the level at which this would be a more likely response to the introduction of the levy) and is unlikely to have a material impact on the revenue estimates included in the model.
- Establishment costs are estimated on the introduction of the levy in Nottingham; if the levy operations were to be paired with ‘smarter’ travel demand management tools, the cost of implementation and operation may be higher than what is indicated in this model.

7.11 Further work / next steps

Outputs from the financial model will be used as inputs to the TBC Business case:

Economic Case:

- Assessment of the extent to which the parking levy reduces traffic demand.
- Quantification of forecast benefits
- Identification of material assumptions and uncertainties affecting benefits realisation.
- Identification and assessment of main risks affecting benefits realisation.

Financial Case:

- Up front implementation costs
- Capital expenditure.
- Ongoing operational costs
- Total expenditure
- Revenue
- Cash flow projections
- Capital funding required.
- Operational funding required.
- Evaluation period
- Description of the model and the costing methodology used.
- Key assumptions in the model including how these assumptions were derived and agreed (for example, discount rates, inflation, taxation, depreciation, cost savings)
- Description of the proposed funding arrangements
- Contingencies for risks and uncertainties, including scenario testing on key assumptions (where required)
- Capital and operating impacts on the organisation’s finances, and
- Fiscal impacts on the organisation(s) baseline(s).

8.0 ECONOMIC APPRAISAL

8.1 Economic Costs

The main economic costs associated with a parking levy are the administration costs of the scheme, and the deadweight loss that typically results from taxing a market. Balancing this, the parking levy will reduce the deadweight loss that currently exists as a result of the Fringe Benefit Tax exemption for employer-provided parking.

Administration Costs

Annual operating costs are estimated at \$1.33 million in 2036.

The establishment costs of the parking levy are relatively minor at \$3.76 million over three years; spreading this cost over a period of 15 years gives \$0.25 million per year.

As such, we have assumed a total \$1.58 million in administration costs for our evaluation year of 2036.

Deadweight Loss from Taxing a Market

The New Zealand Government generates most of its revenue from income tax, GST and company tax. Most of these taxes create a 'deadweight loss': a cost to society created by lost economic efficiency, which arises when we tax things, we would actually like more of. The Treasury (2015) recommends that Cost Benefit Analyses allow for a deadweight loss of 20% "*in the absence of an alternative evidence-based value*". In the case of the parking levy there is strong evidence that the deadweight loss would be much smaller. We estimate the deadweight loss to be roughly 6%, based on the size of the levy relative to the market and the inelastic nature of demand and supply.

We estimate this based on results from the parking levy financial model ("Trip volume calcs - Scenario 3" worksheet), calibrating as follows:

- Without a levy in place, there are 8,733 commuter-occupied parking spaces in the 'high price' zone in carparks with 11+ spaces, and 6,524 in the 'low price' zone (derived from cells V438 and V439 of the Financial model, deducting spaces in carparks with 10 or fewer spaces).
- We assume initial equilibrium prices of \$20.64 in the high price zone and \$14.04 in the low-price zone (daily prices, including GST), as per the model.
- We assume elasticity of -0.45 for demand and 0.45 for supply. The demand elasticity is a simplification from the financial model, which uses varying elasticities depending on the suburb of origin; 0.45 is an average value. The financial model does not explicitly state supply elasticities, but its 'pass through' assumptions imply supply elasticities that are in a similar range to the demand elasticities.
- Overall, the formulas and coefficients are: $D(p) = ap^{-e}$, and $S(p) = bp^e$ pre-levy and $S(p-t) = b(p-t)^e$ post-levy. The pre-levy price is p , the levy is t , elasticity is e . All of these parameters, as well as pre-levy quantities, are set as per above. This then allows the constants a and b to be calculated. We calculate $a = 34,100$ and $b = 2,236$ in the high-price zone, and $a = 21,420$ and $b = 1,987$ in the low-price zone.
- The post-levy quantities and prices then emerge from this simple model.

- The above assumptions generate post-levy prices of \$26.24 in the high price zone and \$17.97 in the low-price zone. This implies 'pass through' of 62% and 56% respectively, which is reasonably consistent with the financial model.
- They also generate post-levy quantities of 7,839 levied parking spaces in the high price zone and 5,838 in the low-price zone. The quantity reductions are a little smaller than generated in the financial model, which gives 7,711 spaces in the high price zone and 5,747 in the low-price zone (derived from cells V879 and V880 of the Financial model, deducting spaces in carparks with 10 or fewer spaces).
- The gross levy revenue is equal to the levy charge multiplied by the new equilibrium quantity Q_2 . The deadweight loss can be approximated as $(P_2 - P_1) \times (Q_2 - Q_1) / 2$. Using this simple economic model gives a deadweight loss of 5.7% in the high price zone and 5.9% in the low-price zone.

The relevant figures are shown graphically in **Figures 8.1 and 8.2** below.

Figure 8.1: Estimated Market Changes in the 'High Price' Zone, Post-Levy

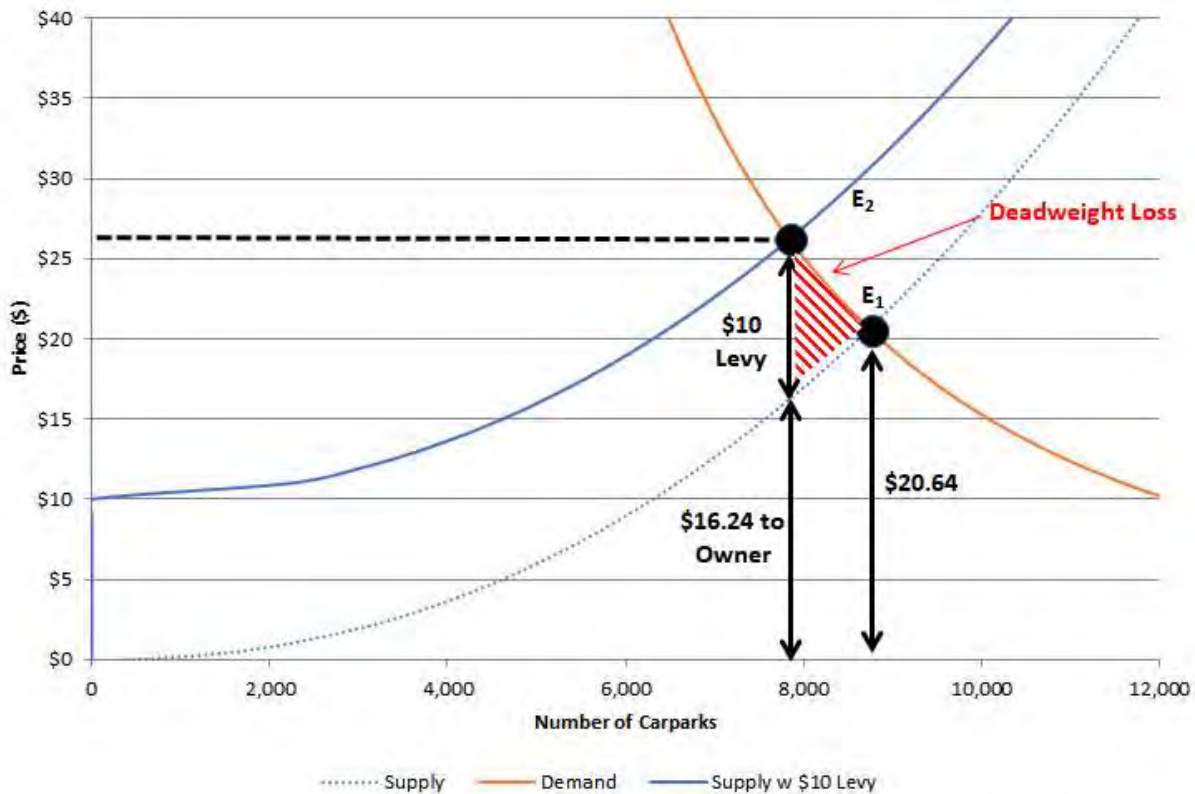
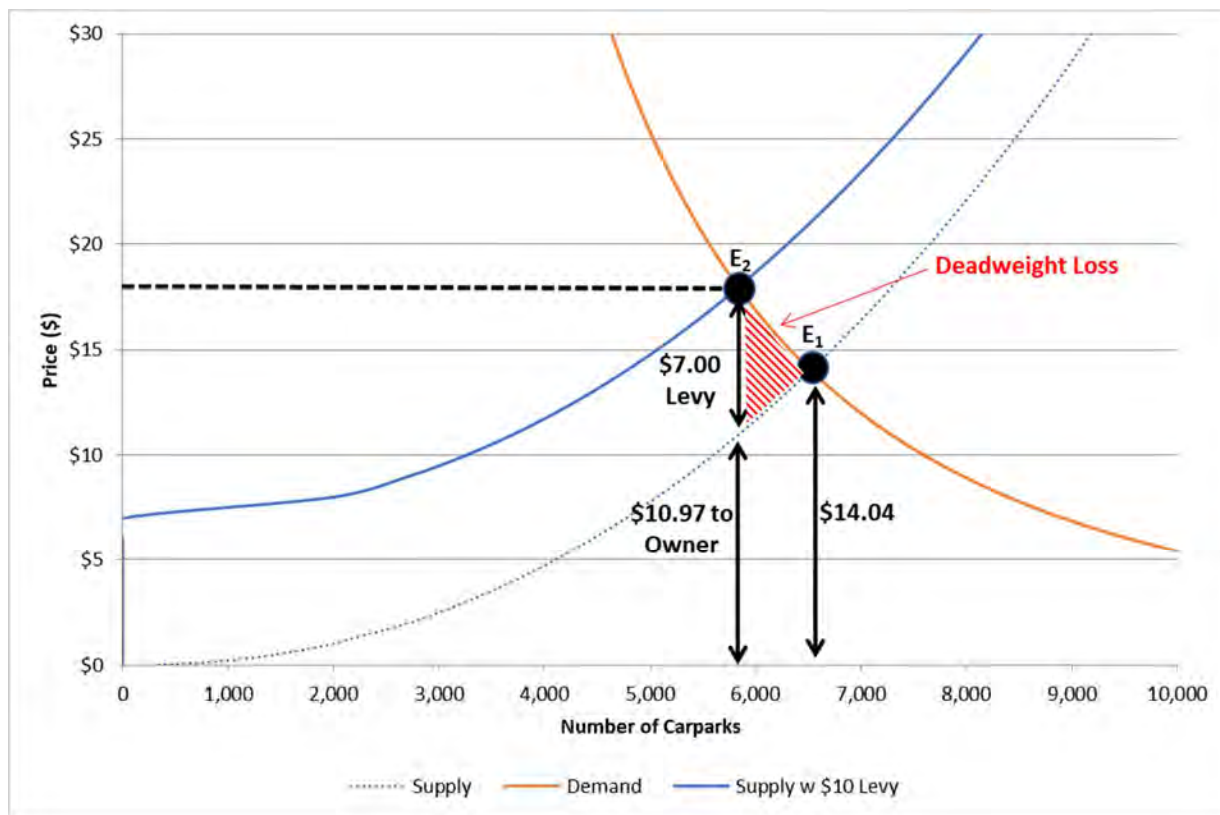


Figure 8.2: Estimated Market Changes in the 'Low Price' Zone, Post-Levy



The prices above are shown on a daily basis and include GST; converting these to annual, GST exclusive figures suggests gross levy revenue of \$17.0 million from the high price zone and \$8.9 million from the low-price zone giving a \$25.9 million total. This is similar to the finance model output, which is expected given that we have used the same pre-levy prices and quantities as the finance model and similar elasticity/passthrough assumptions.

The deadweight loss is estimated at \$970,000 from the high price zone and \$520,000 from the low-price zone for \$1.49 million total. Scenario testing could be done on these numbers – e.g. testing higher elasticities, which would increase the deadweight loss – but this is our preferred figure for comparing the benefits and costs.

Lastly, we note that carpark owners/ operators can make the vacated spaces available for casual parkers and earn untaxed revenue from those. This would increase the total surplus in the market for casual parking, and partly compensate for the deadweight loss in the market for commuter parking. A rough estimate is that this could reduce the burden on carpark owners/ operators by 10% to 20%, and indeed possible reductions to WCC on-street parking (as part of other LGWM projects) would further encourage this shift. In the longer term, carpark owners/ operators are incentivised to look at other non-parking uses as well.

Reduced Deadweight Loss from the FBT Exemption on Employer-Provided Parking

Parking in the Wellington CBD is likely to cause negative externalities beyond just congestion. As noted in **section 4.5**, Van Ommeren and Wentink (2012) found that Fringe Benefit Tax exemptions for employer-provided parking create deadweight loss, i.e. more parking is provided than is 'socially optimal'. A parking levy helps to reduce this deadweight loss.

Van Ommeren and Wentink (2012) estimated that 10.2% of current parking expenses in Holland are a deadweight loss – simply due to the distortionary impact of the FBT exemption and excluding any welfare effects “*due to increased energy use, pollution, congestion and reduced agglomeration*”. The percentage could be quite different for Wellington – e.g. New Zealand has lower income tax rates than Holland – but as a very indicative estimate, we can make the calculation below:

- Say 20% of the 19,405 drivers to the CBD have their employer pay for their parking (broadly in line with our survey results).
- The vast majority of employer-provided parks are in ‘private’ buildings, with roughly 65% in the high-price zone (\$5,160 per year) and 35% in the low-price zone (\$3,510 per year). This suggests a weighted average price of around \$4,583, including GST.
- We then divide by 1.15 to remove GST and multiply by 10.2% as per Van Ommeren and Wentink (2012) to derive our estimate of deadweight loss.

This gives $20\% \times 19,405 \times \$4,583 / 1.15 \times 10.2\% = \1.58 million per year as an estimate of the deadweight loss from the FBT exemption. This is offset by the parking levy.

Summary of Economic Costs

The economic costs of the parking levy are equal to the administration costs of \$1.58 million plus the taxation deadweight loss of \$1.49 million, minus the reduced FBT deadweight loss of \$1.58 million. Effectively, the deadweight losses from the levy itself (those that arise from any tax) are likely to be fully offset by the reduced deadweight losses from the existing FBT exemption.

This suggests total economic costs of \$1.49 million.

This finding is sensitive to changes in the assumptions used, but we consider it to be a realistic figure. The key point is that any deadweight losses are minimal, and there may even be a reduction in deadweight loss compared to the status quo, meaning that there are only minor economic costs beyond the levy’s administration cost.

However, if the FBT exemption on employer-provided parking were to be removed in future, the economic cost figure above would need to be revised to avoid double-counting.

8.2 Quantified Benefits

Our report and modelling will be used as part of a future WTSM model update, and in other LGWM programme work. Since transport modelling has not yet been completed, we estimate benefits using rule-of-thumb exercises in the meantime.

As per Scenario 3 of the finance model (\$2,500/ \$1,750 levies in the high and low-price zones respectively, with only occupied parks paying the levy), the total number of modelled trips in 2036 is expected to be 19,405 without the levy or 17,732 with the levy (ie 9% reduction) as shown in the Financial Model “Trip volume calcs – Scenario 3” sheet. This is a reduction of 1,673 car trips made up of a slightly larger reduction in the levy zone and a small increase outside the levy zone due to spillover.

Congestion Reduction – Method 1

Grimmond (2017) estimated the costs of congestion in Wellington, using a method previously applied by Wallis and Lupton (2013) for Auckland. These costs are based on the excess costs from the road “operating at capacity”, rather than versus free-flow conditions – these occur only when the road is operating well below capacity, representing an inefficient use of the asset that is “unlikely to be optimal for society as a whole”.

Grimmond (2017) modelled the results for “*traffic movements in Wellington City during a typical weekday*” in 2016 and 2026, and then multiplied by 195 ‘typical weekdays’ to give an annual cost. They ignore

congestion during school holidays and weekends, so their annual estimate is conservative. 39% of costs are associated with the morning peak and 46% with the afternoon peak.

Grimmond (2017) forecast that the costs of congestion will rise in the future: “with no change in the Wellington transport network, the daily cost of road congestion could increase by 35% from \$682,500 in 2016 to \$921,700 in 2026”, although there is uncertainty around the forecast. Their figures continue to be expressed in 2017 dollars, except that they use an 8% higher value of time in 2026 (due to real wage growth) and a higher carbon price of \$25 per tonne rather than \$18.

We note that Grimmond (2017) includes greenhouse gas emissions in their calculation of congestion costs while Wallis and Lupton (2013) did not. However, emissions are only a tiny proportion of the estimated costs (“The social cost imposed by higher greenhouse gas emissions adds... just 0.2% of the total [cost] estimate”), and at any rate the carbon price used in Grimmond (2017) is much lower than the currently prescribed value in NZTA (2018), which uses \$65.58/ tonne.

Table 4 of Grimmond (2017) suggests daily 2026 congestion costs of \$375,200 in the morning peak and \$395,600 in the afternoon peak. However, 2026 is not an appropriate year for modelling the levy impact as it is only ‘year 2’ with the levy in place, and it has not reached its full charge yet. Instead, we look at 2036 and (conservatively) assume that congestion costs do not rise further beyond 2026.

If we assume that all of these congestion costs are due to traffic to or through the CBD, then we can assume that congestion decreases proportionately to the reduced number of vehicles. The first assumption is optimistic and the second is conservative, and on the whole, this is likely to be a ‘high end’ estimate of the congestion reduction benefits. The levy reduction of 1,673 trips should be compared to the total number of vehicles entering the CBD during the morning peak, estimated at 27,375 based on 2019 cordon survey data. This is a reduction of 6.1%. The benefits can then be estimated as follows:

- Assume that the Grimmond (2017) peak congestion cost estimates for 2026 are entirely due to travel to/ through the CBD. Dividing by 27,375 vehicles gives average costs of $(\$375,200 + \$395,600) / 27,375 = \$28.16$ per vehicle per day.
- We understand other work for LGWM uses 220 congested days per year rather than the 195 assumed by Grimmond (2017) and as such we multiply $\$28.16 \times 220 = \$6,195$ per year.
- The parking levy causes 1,673 fewer drivers to commute to the CBD. Multiplying these figures together, we have $\$6,195 \times 1,673 = \10.4 million per year.

By comparison, The Congestion Question (2020) estimated the transport benefits from an Auckland ‘city centre cordon’ at \$27.2 million annually, for the 2028 modelled year. This occurs due to 2,489 fewer peak vehicle trips as per table 15 of that report. The benefit is equivalent to \$10,900 per vehicle per year. Our estimate for Wellington seems reasonable by comparison to Auckland, given that it results in two-thirds the vehicle reduction (1,673 in Wellington, 2,489 in Auckland) and that we are estimating the benefit to be just under 40% of that modelled for Auckland.

Congestion Reduction – Method 2

Booz Allen Hamilton (2005) estimated the “marginal externality costs” from peak travel in Auckland, Wellington and Christchurch in cents per vehicle kilometre travelled. Their Annex B9 and specifically Table B9.1 estimates the figure for Wellington at \$0.28/ km. The Consumers Price Index has increased from 778 in Q1 2005 to 1052 in Q1 2020, so this figure equates to \$0.38/ km in 2020 dollars.

An alternate method for estimating congestion benefits, based on data from Booz Allen Hamilton (2005), is as follows:

- The parking levy causes 1,673 fewer drivers to commute to the CBD.
- Assume an average commute length of 10 vehicle-km per trip (this accords with the data we have available).
- Assume avoided car travel generates \$0.38 per kilometre in congestion benefits.

- Assume each vehicle dissuaded by the WPL leads to two fewer congested trips per day for 220 days per year.
- Multiplying these figures together, we have $1,673 \times 10 \times \$0.38 \times 2 \times 220 = \2.8 million per year.

We consider this to be a 'low end'/ conservative estimate of the congestion reduction benefits.

8.3 Unquantified Benefits

Driving creates various externalities which we have not quantified above. These include:

- Impacts on liveability (eg noise, air pollution, visual impacts).
- Costs from death, injury and property damage.
- Population health effects.
- Greenhouse gas emissions – noting that Grimmond (2017) does estimate the excess emissions from congested driving but applies a much lower CO₂ cost per tonne than used in NZTA (2018). Grimmond (2017) does not estimate the emissions reduction benefit from mode shift.

Any policy which reduces driving and encourages mode shift will be likely to reduce these externalities, although they often work out to be small in dollar terms compared to congestion reduction benefits.

Driving is an inefficient land use: a bus carrying 50 passengers takes up much less road space than the equivalent 30 to 40 cars carrying slightly over one person each. This is especially important for high-amenity, high-land-value areas such as the CBD. Reducing the number of cars can mean reallocating road space to more efficient travel modes. This is consistent with what is envisaged in other LGWM packages.

Alternatively, road space that is not needed for travel purposes could be converted to other land uses. Land in the Wellington CBD is typically valued at \$4,000/ sqm or more (excluding GST), with some central sites valued at \$10,000/ sqm or more. Repurposing road space as public space would be a much cheaper option than, say, WCC buying sites to increase the amount of public space in the CBD.

Mode shift to public transport should also make it more efficient to provide, e.g. through increased farebox recovery and occupancy levels. We have not quantified these benefits here.

It could be argued that parking generates some externalities, over and above those of driving. For example, it could be argued that parking is an inefficient land use; floor space or land occupied by parking could be more efficiently used for other activities, which generate more employment, GDP or housing. Another externality is visual effects, although these are subjective and at any rate off street parking in the Wellington CBD is often hidden above or below ground level.

These parking-specific externalities are difficult to quantify, and we expect that they are relatively minor compared to the other costs and benefits outlined in this report. As such, we consider that the grounds for taxing 'empty' parking are very weak. The main externalities arise from driving in (and to) the CBD, rather than parking in itself. We can still address these externalities through a tax on parking, however, because parking and driving are close complements.

8.4 Effects on Land Use, Economic Competitiveness and Agglomeration

There are also second-order effects from congestion not modelled by Grimmond (2017), and therefore not included in our quantified benefits above. Reducing congestion can lead to wider economic benefits and agglomeration; increased accessibility giving businesses access to a larger labour pool and households access to a larger number of jobs, etc.

A parking levy will contribute towards these outcomes, however as these effects are being estimated for the LGWM programme we have not quantified them here in order to avoid double counting. However, one policy concern for the levy is whether it might have an impact on CBD businesses that is not compensated

for elsewhere. In our view, the evidence from our overseas literature review, the relatively small size of the levy relative to the CBD economy, and the fact that levy funds are being used to improve access to the CBD, all suggest that negative impacts are very unlikely.

Wellington City's Gross Domestic Product (GDP) was estimated at \$25.7 billion in 2019.¹² The CBD is likely to account for at least 70% of this figure, since it has around 70% of the jobs in the city and those jobs are significantly higher income than those outside the CBD.

Conservatively, therefore, the CBD's contribution to GDP can be estimated at \$18 billion.

We estimate that non-residential properties across the CBD currently pay more than \$120 million a year in rates to WCC and GWRC. This includes the targeted transport rate charged by GWRC at \$26 million a year. In addition to this, CBD businesses pay rent, insurance and other operating expenses which can vary from location to location.

By comparison, the parking levy is estimated as costing/ raising less than \$30 million a year, less than 0.2% of GDP but not insignificant by comparison to current rates bills. As discussed elsewhere, much of the levy cost will be passed on to parkers, and CBD property owners and businesses will only bear part of the burden. There are options to mitigate that burden, including changing parks to non-levied uses or even non-parking uses. Even so, the levy does add to their 'cost of doing business'.

The advantage of a tax that affects property owners/occupiers – such as rates, a land tax or the partial burden of a parking levy – is that it cannot be avoided. The land or building cannot be relocated elsewhere. However, this kind of tax can reduce investment in that location or encourage resources to be used in a different way. A parking levy directs resources away from car parking (a less intensive, lower-value use) towards other uses. Most carparks are in basements or existing buildings, but a levy will have a more tangible effect on open-air car parks which are usually intended as development sites in the long term. A levy might encourage development to be brought forward slightly, or even alternative short-term uses such as markets rather than parking. The effects of this are likely to be positive but hard to quantify, and reasonably minor.

If a levy was implemented without any corresponding measures, the value of CBD properties would of course reduce, since the value of car parks is reduced.

However, hypothecation cancels this out. CBD businesses benefit from the funds being reinvested in the CBD, or in ways which improve access to the CBD. Depending on the exact mix of transport projects, the value of CBD land (and properties) is actually likely to increase. The mix of projects is outside the scope of our study, and we simply note that the hypothecation of levy funds for purposes that improve employment access – i.e. high-capacity transit, and active transport – means that the overall effects of a parking levy on CBD property values are likely to be positive, rather than negative.

The comments above focus on property owners rather than building users. However, there is some data available for these as well. The cost of the modelled levy in the high-price zone is \$2,500 a year including GST, and with 50% passed through to the parker, the potential exposure for building users is: $\$2,500 / 1.15 \times 50\%$, or \$1,087 per driver on average. Based on census data, only 30% of CBD workers drive to work, and based on our survey results fewer than 20% of them receive an on-site parking space or have their employer directly/ indirectly pay for their parking. As such, the average cost per worker is $\$1,087 \times 30\% \times 20\% = \65 .

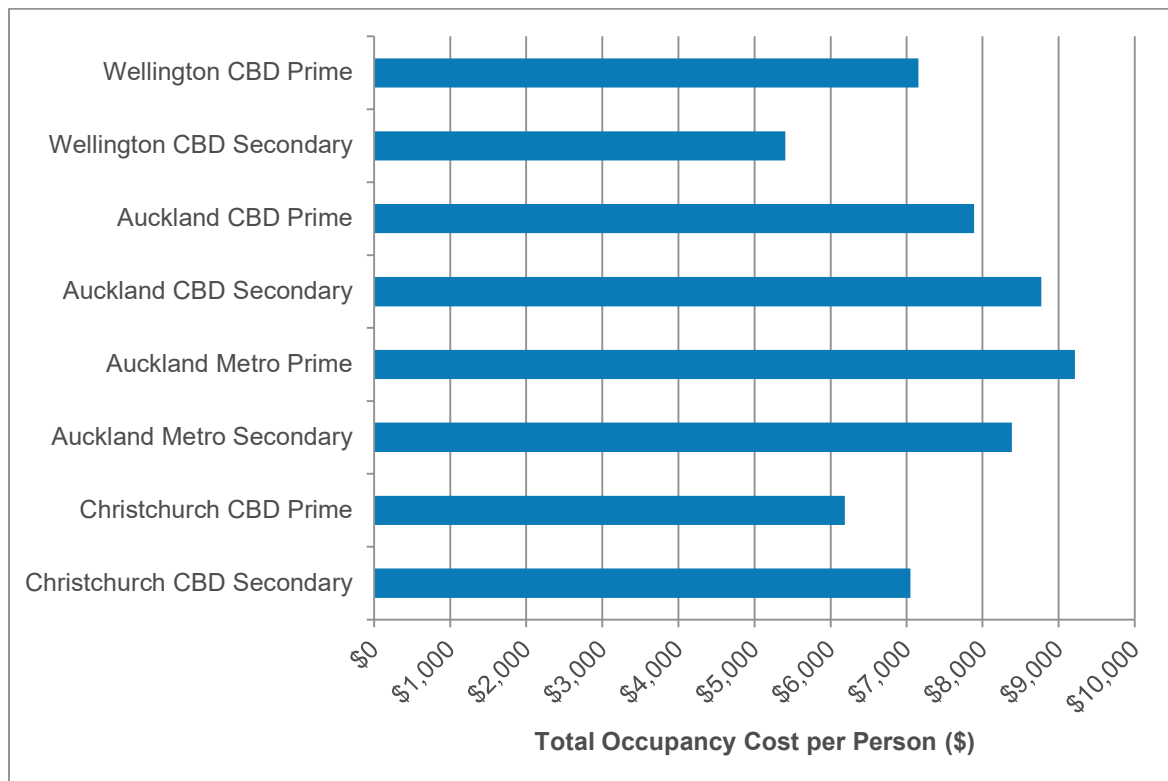
We can compare this to census income data, which shows that the median income for CBD employees is \$73,000, with these incomes paid by the employer. As such, the cost of the levy is tiny in comparison to overall staffing costs. Furthermore, workers who receive an on-site car park tend to have much higher

¹² Source: <https://ecoprofile.infometrics.co.nz/Wellington%2bCity/Infographics/Overview>

incomes and building users will have an incentive to further reduce any levy burden by passing the cost on to the employee.

Colliers data in **Figure 8.3** provides another comparison, looking at the 'total occupancy cost' paid by office employers in the three major centres for prime or secondary office space:

Figure 8.3: Total Occupancy Cost per Person in Wellington, Auckland and Christchurch



Source: “New Zealand Fixed-Term and Flexible Workspace Report 2018”, Colliers

The figures above include all occupancy costs, including parking where it is leased, but exclude GST. Occupancy costs vary due in large part to different ‘worker density’ in different buildings. The above comparison suggests that the cost of a parking levy (averaging \$65 per worker excluding GST, based on our estimates above) would be a very small factor in total occupancy costs, in the order of 1% for a typical CBD office tenant.

Some cost could be ‘passed back’ to the property owner via lower rents, and some of the cost could be ‘passed on’ to the employee.

We can also draw comparisons to the overseas cities that have a parking levy. A number of academic studies, as well as our review of economic indicators, suggest that there have been no negative economic impacts from the introduction of parking levies overseas. In fact, in aiming to address congestion (sometimes with explicit economic goals as well) the overseas levies aim to improve their urban economies:

- One of the key stated objectives for Nottingham levy was “enhancing the attractiveness of Nottingham as a location for business investment”.
- An objective for the Perth Parking Policy was “to ensure the economic vitality of the City of Perth”.

Employment has continued to increase in all four cities who have a parking levy. The number of people using non-car modes has grown significantly while the number of drivers has remained roughly flat (or increased/ decreased slightly, depending on the city and period).

There is no doubt that improving public and active transport was a much cheaper way to increase the accessibility of these areas than improving driving infrastructure. Sydney's CBD would certainly not have grown to 300,000 employees if all commuters had to drive there.

Using reasonable assumptions, we find that the levy cost is only a very small share of the 'cost of doing business' in the Wellington CBD. It is likely to be more than offset by the CBD's other advantages. This is assisted by the levy funds being used to improve its accessibility further. The overall effects on land use, economic competitiveness and agglomeration are expected to be positive.

It is extremely unlikely that any major displacement of economic activity would occur. Our results above suggest that the levy burden is just 1% of total occupancy costs for a typical CBD office tenant, and this is far outweighed by the other cost variations between different buildings and areas. To the extent that any activity did relocate elsewhere (e.g. a new office building was redirected outside the levy area), this would probably be to elsewhere in the same labour market, i.e. smaller hubs such as Newtown, Kilbirnie or Lower Hutt. There might be some very minor implications for agglomeration, but residents near those areas would also appreciate the local employment opportunities.

It is extremely unlikely that any major displacement of economic activity would occur to places outside the Wellington region (i.e. Auckland or Christchurch).

It is quite possible that some workers would work from home some days, rather than driving into work each day. The economic effects of this are uncertain, but likely to be roughly neutral.

The long-term structural effects of Covid are still uncertain, but it is quite possible that they will have a bigger impact on working from home (and car commuting during peak times) than a parking levy would. As outlined in **section 2.2.7**, LGWM is assessing Covid effects at a programme level. It is also likely that working from home to avoid paying a parking levy will be a more common response in a post-Covid world than it would have been in a pre-Covid world.

8.5 Summarising Levy Costs and Benefits

Costs

Our cost estimates are as follows:

- Administration costs = \$1.6 million.
- Taxation deadweight loss from the levy = \$1.5 million.
- Reduced deadweight loss from the FBT exemption = -\$1.6 million
- Total economic costs = \$1.5 million.
- This finding is sensitive to changes in the assumptions used, but the key finding is that deadweight losses are minimal and may even reduce compared to the status quo. The main economic costs are therefore the levy's administration costs.
- If the FBT exemption on employer-provided parking were to be removed in future, the economic cost figure above would need to be revised to avoid double-counting.

Benefits

Our estimates for the benefits that we have quantified are as follows:

- Congestion reduction = \$2.8 to \$10.4 million.
- Total quantified economic benefits = \$2.8 to \$10.4 million.

We also note the following unquantified benefits:

- Reduced externalities from driving (noise, air pollution, visual impacts, accidents, population health, greenhouse gases).
- Reduced externalities from parking (land use inefficiency, visual impacts).
- Freeing up road space for more space-efficient travel modes or alternative land uses.
- Any other effects on liveability not covered above.
- Improving the efficiency/ utilisation of public transport and therefore farebox recovery.

Any effects on ‘Land Use, Economic Competitiveness and Agglomeration’ have not been quantified, but are expected to be positive assuming that the levy funds are hypothecated.

Benefit Cost Ratio (BCR)

The ‘congestion reduction benefits’ from the parking levy will be subject to further transport modelling work, not within the scope of our report. However, it is highly likely that these benefits alone exceed any economic costs. This means a BCR of greater than 1 (from this initial estimate it is in the range of 1.9 to 6.9), providing a strong initial argument for a parking levy. Additionally, many benefits have not been quantified.

Lastly, thinking of the levy as a revenue raising tool, we note that funding this revenue from other sources (e.g. general taxation) would create a larger deadweight loss, which is an opportunity cost for those other sources.

8.6 Equity or Distributional Effects

Page 31 of the RFP requested assessment of “any social and equity impacts of the option, including the extent to which such effects can be effectively managed and/or minimised. Equity (or ‘fairness’) considerations are considered to be an objective of the Parking Levy as detailed in **Section 3**. Many LGWM strategic documents have an equity thread running through them, even where equity is not a clearly stated objective. Equity is also noted as a consideration in the Economic Evaluation Manual, appendix 17:

“An analysis of the distribution of benefits and costs among different groups of people is not required for the economic efficiency evaluation of the project. However, reporting of the distribution of benefits and costs, particularly where they relate to the needs of the transport disadvantaged, is part of the funding allocation process” (NZTA, 2018).

Equity studies usually make the distinction between ‘vertical’ and ‘horizontal’ equity:

- Vertical equity: how does the policy affect different socio-economic groups, with different levels of ability to pay or mitigate costs?
- Horizontal equity: are the people paying for the policy the same people benefiting from it?

In Auckland, The Congestion Question (2020) included a “Vulnerable Households Assessment” with qualitative interviews of 50 households, and options for mitigation. These options included financial compensation for vulnerable households, with compensation paid out of the scheme revenues and eligibility potentially based on Community Services Cards.

The Congestion Question (2020) looked at congestion charging in the city centre only, or across a wider range of key corridors, or across other geographic areas e.g. the Auckland isthmus. Compared with these wider areas, the equity impacts of a City Centre Cordon were found to be “modest because of the small number of trips impacted and wide availability of public transport alternatives” (The Congestion Question, 2020).

It is important to consider not just the parking levy as a tax, but whether the revenue will be used in a way that supports efficiency and equity. Nunns et al (2019) argue that “*the use of revenues is at least as important to distributional impacts*” as the costs themselves. We agree with this and recommend hypothecation of levy funds as an appropriate way to support equity.

We have identified the following groups of people/ households/ entities who could be affected by a parking levy. Note that there may be overlap between some of these groups, and only the first four groups are considered in our economic/ financial modelling:

- People who work in the CBD and usually drive (roughly 20,000 on a typical day).
- Owners of CBD properties.
- Tenants and other users of CBD properties.
- Parking operators of CBD properties.
- People who work in the CBD and usually take other modes (roughly 60,000 on a typical day).
- People travelling for other purposes during peak times (perhaps 10,000 on a typical day), who may park in the CBD or drive through it.
- People who live in the CBD (roughly 20,000).
- People who study in the CBD (roughly 10,000).
- Other people who visit the CBD for other purposes (including attending work-related meetings, but also for shopping, dining, leisure or other purposes).

Vertical Equity

Nunns et al (2019) cite a number of groups who may be disadvantaged by certain transport policies: those on low incomes, with disabilities, the elderly, women, ethnic minorities, or people without access to public transport. We suggest adding children to this list.

We assume that carpark owners and operators are unlikely to raise any vertical equity considerations so do not consider them here, but we do consider them under horizontal equity.

Low-income households are much more likely to be without access to a motor vehicle. This is borne out in 2013 census data. Across the four Wellington city council areas, 17% of all households had an income below \$30,000, but 51% of households without a motor vehicle had an income below \$30,000. For Wellington City itself, the differences are a little less stark: the percentages are 14% and 40% respectively.

Policies that make it easier to get around without using a car – i.e. public and active transport investments – will be especially positive for these households and support vertical equity. Of course, a parking levy will not directly affect these households.

In Wellington City, 10,300 households (14% of all households) do not have access to a motor vehicle as of 2018; more than double the national average of 6%. 3,200 of those households live in the CBD.¹³ For some of these households, being carless will be a choice rather than a constraint; it reflects good access to other transport modes.

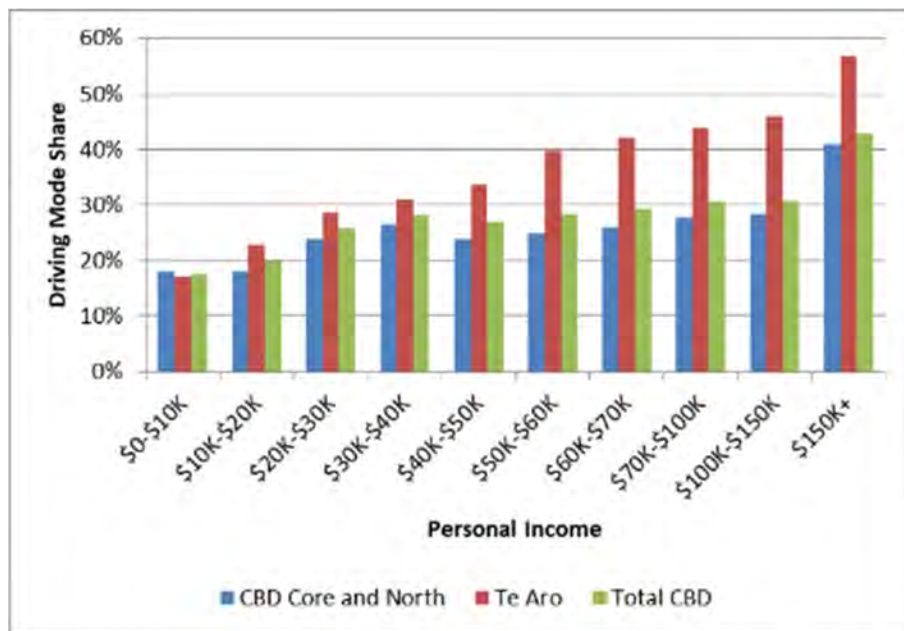
The other 86% of households in Wellington City do have access to a motor vehicle, with the majority having access to two or more vehicles. For the three neighbouring cities, around 90% of households have access to a motor vehicle.

Even though most people working in the CBD are likely to have access to a car, they choose not to drive to work. On average, 70% of commuters use non-car modes to get to work.

¹³ These figures, and those in the following paragraphs, are based on our analysis of 2018 census data.

This percentage does vary based on a range of demographic and locational factors. **Figure 8.4** below shows how driving mode share varies based on personal income, and workplace location, using custom 2018 census data:

Figure 8.4: Driving Mode Share by Income and Workplace Location



We see from this that higher-income workers are more likely to drive. The trend is not exactly linear, and perhaps it is more accurate to say that lower-income workers are less likely to drive.

For the 'CBD Core and North', driving mode share is quite similar (and low) for workers earning \$20,000-\$150,000. A full-time worker on minimum wage would have earned around \$33,000 a year, so it seems it is only part-time workers who were much less likely to drive.¹⁴ However, there is a sharp increase in the driving mode share for people earning over \$150,000 – this may well reflect that they are more likely to receive parking as a fringe benefit.

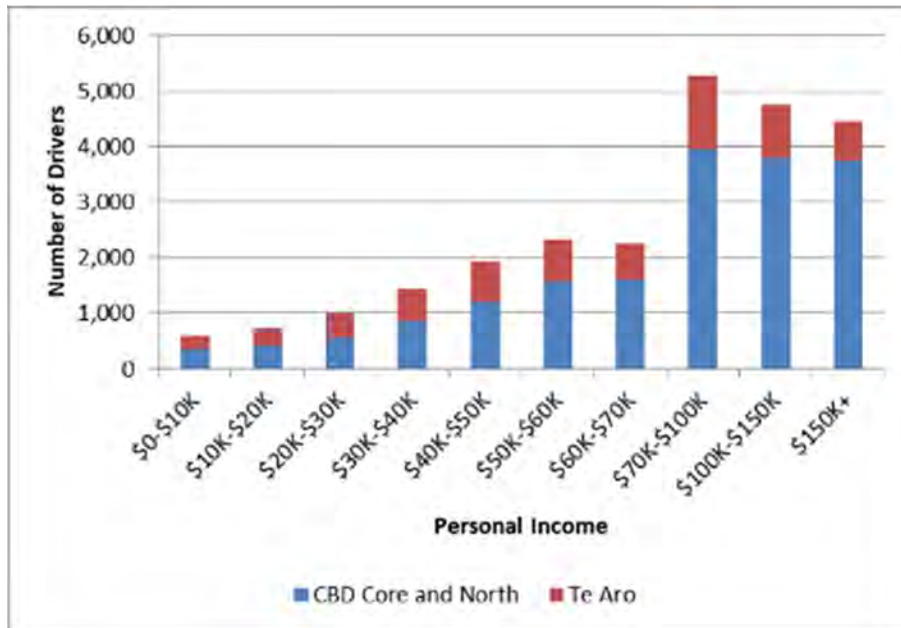
For Te Aro, driving mode share rises more steadily with income. For low-income workers, driving mode share is similar to those working in the CBD Core, but mode share increases more noticeably for workers earning over \$40,000. More than half the Te Aro workers earning over \$150,000 drive to work.

Figure 8.4 gives an idea of how likely people are to drive at different income levels. However, the actual number of people driving is quite different, because CBD workers are more weighted towards high incomes.

Figure 8.5 below shows the total number of drivers in each income bracket:

¹⁴ Minimum wage increases don't quite align with census timing. We have assumed a wage of \$16 an hour times 40 hours times 52 weeks. The minimum wage was \$15.75 on census day 2018 and rose to \$16.50 the following month.

Figure 8.5: The Number of Drivers by Income and Workplace Location

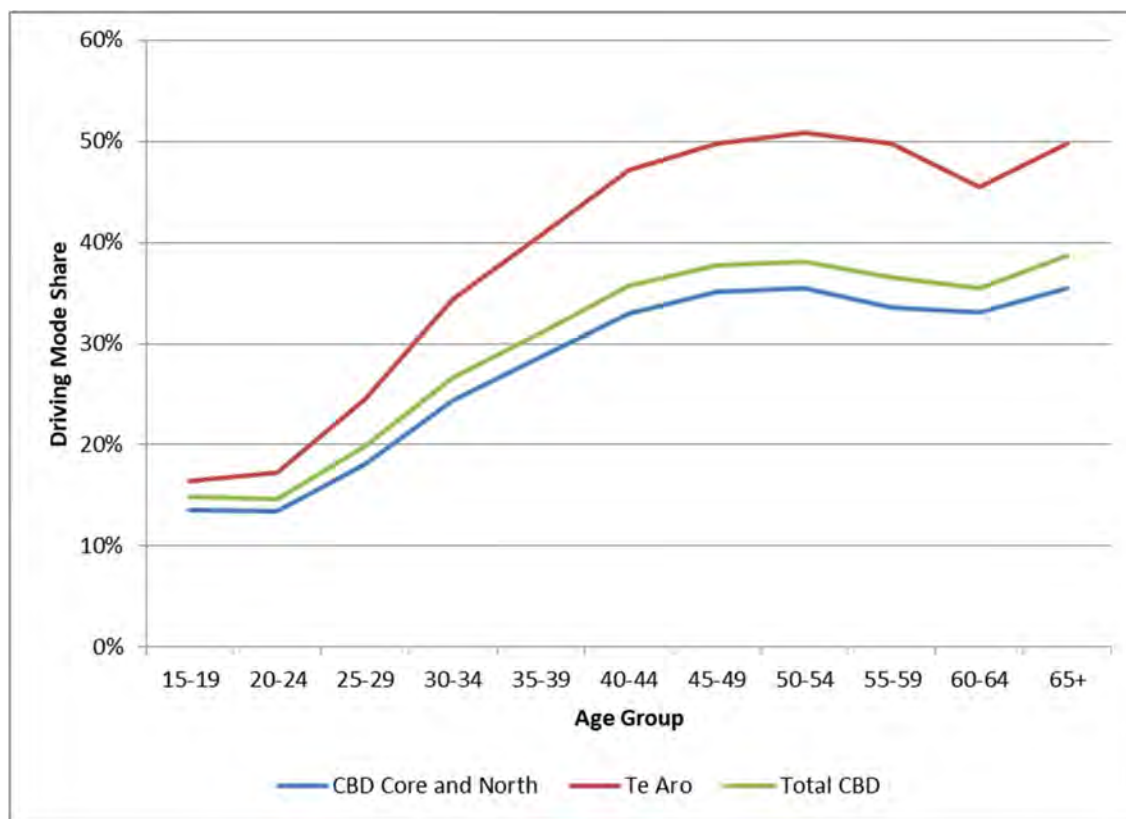


For the 'CBD Core and North', 11,500 out of 18,000 regular drivers earn over \$70,000 and are in the top personal tax bracket. For Te Aro, the proportion is smaller (2,900 out of 6,700). Overall, 58% of CBD drivers earn over \$70,000, with many earning well over \$100,000. The median income for CBD drivers is \$82,000, vs \$70,000 for non-drivers.

Nunns et al (2019) find similar results to our ones above, using 2013 census data. They identify “a strong positive correlation between car commuting [to or through the CBD] and high household incomes”.

We can also look at driving mode share by age group (see **Figure 8.6**):

Figure 8.6: Driving Mode Share by Age Group and Workplace Location



Older workers are more likely to drive than younger ones. This may have no extra significance for equity; older workers are more likely to earn high incomes, and they may also have children and choose to drive them to school and then to work as a result. Driving mode share reduces slightly for people in their 50s – when incomes tend to fall a little, and children are more independent – but remains much higher than for younger people. However, the overall numbers are small; two-thirds of CBD drivers are under 50, and only 4.5% are over 65.

Children under 15 are too young to drive, but they are often passengers. 2018 census ‘journey to education’ data shows that:

- 264 out of 366 children aged 0-4 usually travel as car passengers, with the rest coming via walking or bus.
- 294 out of 540 children aged 5-9 usually travel as car passengers, with most of the rest coming via walking and a small number via bus or train.
- 444 out of 1,467 children aged 10-14 usually travel as car passengers, with the majority coming via walking, bus, train or school bus.

Overall, a parking levy is unlikely to have significant impacts on either the elderly or children, and any scheme which reduces driving could be argued as better for children.

Census data also shows that male CBD workers are slightly more likely to drive than female ones across most age groups. This suggests that a parking levy is unlikely to have significant impacts on women.

We do not have the data to assess the effects of a levy on ethnic minorities but given that Pākehā are more likely to earn high incomes, they are probably more likely to drive as well.

All the overseas levy schemes, and the proposed Wellington scheme, grant an exemption for disabled parks. This should encourage owners/ operators of carparks to convert some of their spaces to disabled parks, increasing their supply. This is a positive outcome for vertical equity. As with all disabled parks, monitoring will be needed to ensure that the spaces are not misused by people who are not entitled to park there.

Overall, we conclude that a parking levy performs well in terms of vertical equity: most drivers earn high incomes, with people on low incomes much less likely to work in the CBD or to drive if they do work there. The exemption for disabled spaces also promotes equity.

Perhaps the only issue for vertical equity from the list in Nunns et al (2019) is “*people without access to public transport*”. This issue could be mitigated by applying levy funds in ways that improve public and active transport access.

Horizontal Equity

One theme outlined in Nunns et al (2019) is that any policy change will have winners and losers, but this is not always a concern for equity. “*The status quo simply represents a baseline of inequity, which may in fact also be inherently inequitable by many definitions. Interventions may shift the winners and losers, bring equality, or maintain the status quo*”. It could be argued that parking providers benefit from an inequitable status quo; there are too many drivers, generating congestion but also creating more parking revenue.

Others lose out from the status quo. Congestion and high vehicle numbers lead to more noise and air pollution, with the impacts of this mainly felt by CBD residents and those living next to motorways and major roads – regardless of whether they themselves contribute to congestion. People living next to transport corridors (or polluted areas more generally) are often more likely to be in deprived socio-economic groups, or at risk of poor health outcomes.

Horizontal equity is more complex than vertical equity. However, a parking levy has a good starting point since most CBD commuters, and most CBD users generally (including residents, students and visitors), do not contribute to the issues that the levy wants to address and will not need to pay the levy.

The levy is also more equitable than most taxes in the sense that it addresses externalities (mainly congestion, as well as the FBT exemption), rather than taxing positive activities like earning income or profit. Equity can be improved by charging the levy at a rate which ‘internalises the externalities’ and is not overly onerous. In regard to whether the levy is onerous, we can refer to the level charged in the overseas schemes and compare the levy cost to the price of parking in Wellington. We see a levy of \$2,500 including GST as being relatively fair using these comparisons, whereas a levy of \$5,000 would be out of proportion and would be much less equitable.

The most significant issue for equity, in our view, is that drivers who do not park do not pay. This is a ‘free rider’ problem, a source of inequity arising from the parking levy. Drivers who are passing through, dropping someone off or delivering passengers (i.e. taxi/ Uber drivers) will not pay the levy even though they contribute to traffic volumes. There is a reasonable amount of traffic in these categories, but less than in some other cities. We see this as an issue for the scheme but not an insurmountable one.

A second issue is that drivers who live in certain areas (or who work in certain parts of the CBD) have better alternatives to driving than others, as mentioned above under ‘vertical equity’. This is the “*baseline of inequity*” noted by Nunns et al (2019), which might perhaps be worsened by a levy. We suggest improving the alternatives to driving for those areas especially, to improve equity outcomes.

Charging a lower levy rate for Te Aro or improving its public and active transport options may well improve the equity of the scheme, since parking costs are lower here and driving mode share is higher. However, further work should be done as to whether this is a ‘worse access’ issue or a ‘cheap parking’ issue.

A parking levy that is better targeted at commuters – i.e. where the costs fall on people driving at peak times – will perform better on horizontal equity, since the levy will reduce congestion levels. This makes our preferred levy design better than a ‘flat rate’ one, and potentially better than one which doesn’t distinguish between commuters and casual users.

Our preferred levy design may well lead to cheaper casual (hourly) parking. It is debatable whether this is positive, negative or neutral for equity. It could also be considered in the context of other WCC/ Government goals, or in the context that the LGWM programme could remove some on-street parks (which might ‘cancel out’ the conversion of off-street parks from commuters to casual parkers).

If we look at the ‘supply’ side of parking, we note the following potential issues:

- An issue with the Sydney scheme is that it exempts on-street spaces, giving the local council a cost advantage versus off-street short-stay spaces which have to pay the levy.
- Exempting small carparks (or residential carparks which are rented out to commuters) gives them a cost advantage, but this has to be balanced against the higher administrative costs associated with small carparks.
- Exempting carparks which are owned by public or not-for-profit entities would give them a cost advantage. This could be argued as promoting vertical equity but undermining horizontal equity. It is inefficient as it means those entities do not have the same incentive to change behaviour; it actually gives them a windfall gain.
- With the unprecedented disruption of Covid, it seems inequitable that parking owners whose spaces are empty may still have to pay full levy charges in some cases.

Our preferred levy design addresses some of these issues, with others (eg Covid impacts) yet to be determined.

The Wellington levy’s focus on commuters means that it is appropriate to exclude (short-stay) on-street parking. This would not be equitable in all circumstances, e.g. in the Sydney scheme where short-stay parks are liable if they are off-street but not if they are on-street.

The equity effects of exempting charitable/ volunteer/ non-profit parking are ambiguous. On the one hand, these groups might be less able to pay. On the other hand, they might still be contributing to peak traffic volumes. Our view is that these carparks should not be exempt.

Some property owners will bear a larger burden than others, but this is proportionate to their contribution to car commuting. We see this as broadly equitable. It is not clear to us whether a parking levy is more or less equitable than the transport targeted rate which is based on property values only; both schemes have their pros and cons.

Phasing in the levy cost over several years is better for equity, as it allows time for parking owners, operators and users to factor the levy into their business decisions. A large proportion of parking leases will come up for renewal in any 5-year period, so allowing for a 2-year consultation and legislative process followed by phase-in over 3 years will give time for many lease arrangements to be renegotiated.

Comments on Equity for the ‘Intermediate’ Parking Markets

We suggest that the incidence on public parking operators will be reasonably small, because:

- Car park operators are usually ‘capital light’ except where they own the property. There is a fairly low level of investment required.
- The margins for car park operation are very low, as noted earlier. Regardless of whether the car park is leased or managed, the majority of net revenue (after paying expenses) accrues to the property owner.
- Some carparks are operated under management agreements rather than leases. For these carparks, almost all of the risk and reward sits with the property owner. Under a parking levy, it is possible that more carparks would shift towards the ‘management’ model, as the operator would want to reduce their risk exposure.
- Conversely, it is possible that owners are even more risk-sensitive and would shift towards the ‘lease’ model even if they have to forfeit some revenue.
- In the long term, leases and management agreements both expire, and full responsibility returns to the property owner. New leases or agreements will be signed, but they will reflect the new market conditions. Given their small net margins, carpark operators will push most of the levy cost either on to consumers or back to the property owner.
- Feedback from public carpark operators suggests that they would seek to pass the levy costs on to parkers as much as possible. However, logic dictates that they will also renegotiate lower rents with their landlords or exit some sites where this is not viable.

The incidence on building users (office tenants, etc) may be larger. As highlighted elsewhere, these users lease a number of parks for their own purposes (fleet vehicles, visitor parking or spaces for senior staff as fringe benefits). They can choose to lease fewer carparks and reduce their fleet size, or the levy may act as an impetus for them to renegotiate salaries so that staff actually pay for their carpark rather than receiving one ‘for free’ – either way, the Fringe Benefit Tax issue discussed later means that the staff member does not feel the full effect of a cost increase.

Overall, though, we expect that most of the burden not passed on to parkers will be borne by property owners, rather than the intermediate carpark operators or building users. Any equity concerns for the intermediate markets are minor, especially for building users who benefit from increased accessibility post-levy.

Are Public Car Park Levied Groups Likely to ‘Pass Costs On’ to Other Cities?

We have considered the possibility that some public car parking owners or operators will attempt to pass the cost on to parkers in other cities – i.e. ‘spreading the burden’ over parkers in Wellington, Auckland and Christchurch. We believe this is highly unlikely for the following reasons:

- A similar issue was raised for Auckland’s Regional Fuel Tax.¹⁵ The fuel retailing market is Auckland’s Regional Fuel Tax dominated by three companies with nationwide coverage (the jointly owned Caltex and Z Energy, plus BP and Mobil), which makes it easier for them to spread their costs out. Even so, the risk was seen as one which could be mitigated through transparent reporting of prices.
- A more salient issue for the fuel tax was that petrol stations a short distance outside the Auckland Region could avoid the tax, but still serve Auckland drivers to an extent as they formed part of the same general market.
- In each major city, there are a large number of property owners involved, many of whom only own properties in that city. There are also a large number of building users, many of whom are largely or entirely based in that city. The number of parking operators is smaller, but even then, some of them are city specific (WCC, Primeparking and the independents in Wellington, Tournament and

¹⁵ “Price spreading”, as mentioned in <https://www.treasury.govt.nz/sites/default/files/2018-06/ria-transport-arft-jun18.pdf>. See also <https://www.stuff.co.nz/auckland/106992491/are-nonaucklanders-paying-the-regional-fuel-tax> for a follow up.

Cooper & Company in Auckland, and councils up and down the country). Parking providers in Wellington will face the levy costs but those elsewhere will not. This makes it harder for cost shifting to occur.

- More significantly, the Wellington CBD parking market is completely distinct from the markets in Auckland or Christchurch. It has different employment and transport characteristics, and different competitive factors. If parking providers could increase their profits by increasing prices in other cities, they would already be doing it.
- Again, the more salient issue to us seems to be related to 'displacement': e.g. carparks operating just outside the levy boundary can still serve the same market, while avoiding the cost. This is one of the issues considered by the parking levy team and can be addressed through increasing the (often under-priced) charges in these areas or restricting new parking supply through planning rules.

Improving the Equity of a Parking Levy

Despite some issues with horizontal equity, we conclude that overall a parking levy will be broadly equitable. The equity of the parking levy scheme can be further improved by:

- Designing the scheme to target commuters driving during peak times.
- Exempting disabled spaces.
- Charging a lower rate for Te Aro.
- Looking at complementary measures that target taxis/ Uber, or which discourage unnecessary through traffic or drop-offs (this could include road closures, slow streets etc).
- Giving opportunities for parking owners/ operators to mitigate the levy's impact by keeping carparks empty (or by leaving them available for casual parkers).
- Phasing the levy cost in over several years.
- Hypothecating levy funds for purposes that improve accessibility and equity. These could include public and active transport investments, and in particular improving the alternatives to driving for suburbs where these are currently limited.

Conclusions on Equity

- A parking levy performs very well on vertical equity measures and relatively well on horizontal equity. It addresses an externality and is broadly 'user pays', making it more equitable than most taxes.
- Most Wellingtonians own cars, but most CBD commuters choose not to drive them to work.
- Many of those that drive are likely to do so out of choice and convenience, rather than out of necessity.
- Higher-income commuters are much more likely to drive, especially in Te Aro.
- 60% of driving commuters earn over \$70K, i.e. in the top tax bracket. Some can also access 'free' or cheaper parking due to the Fringe Benefit Tax exemption. This reflects an existing pattern of inequity and the parking levy alone will not address it to any large extent.
- The main equity issue is that drivers who do not park do not pay. It may be possible to address this to a limited extent.
- A second issue is that some workplaces or suburbs have better alternatives to driving than others. This is an existing pattern of inequality, but levy funds could be allocated to help improve it.
- Te Aro has higher driving mode share across all income groups over \$40K. This may be due to cheap parking, or fewer transport choices. However, setting a lower levy rate acknowledges this dynamic.

- Policies that improve access to public or active transport are likely to be positive for equity – both horizontal and vertical measures. Using parking levy funds for these purposes would mitigate many equity concerns.

8.7 Comments on Hypothecation

Hypothecation, also known as ring-fencing, is where a government or council earmarks some of its tax revenue for clearly identified spending purposes.

There are arguments for and against hypothecation of tax revenue, which can be summarised as:

- It reduces the government’s ability to spend on the highest-value items.
- It reduces the government’s flexibility.
- It assures continuity of funding for particular programmes, helping long-term planning.
- It can make a tax more politically and publicly acceptable.
- It can make a tax more equitable as there is a degree of ‘user pays’.

We note that a large share of New Zealand’s transport system is already built on hypothecated funding, most notably the National Land Transport Fund.

Three of the four parking levies overseas have hypothecated their levy revenue. This was a key factor in getting political and public buy-in and is also seen as making them more equitable. It also enabled positive feedback loops to help achieve the levy aims – for Wellington, the aim is to reduce car travel during peak periods, so levy funds should be invested in ways that will reinforce this.

For a Wellington parking levy, we are firmly of the view that the pros of hypothecation outweigh the cons.

We do not have a firm view on exactly how the hypothecation should work but would advise against making it either too restrictive or too loose. Perth has overly limited the purposes its levy funds can be used for, and as a result the fund has now grown to \$153 million – equivalent to almost three years’ worth of revenue.

It could be argued that some levy funds should be directed towards car infrastructure, since drivers are the ones directly paying, but this would counteract the levy objective of reducing driving. We would recommend against this, and hypothecation should be for public and active transport only. Indeed, some of the Australian schemes do not include active transport, but this is an unfortunate omission as investments in these modes often have excellent Benefit Cost Ratios.

8.8 Unintended Consequences of a Parking Levy, and Other Considerations

A parking levy may affect people’s behaviour in ways that are not easy to capture in a financial model or to quantify in economic terms. This could include some ‘unintended consequences’ or perverse outcomes that act against the levy objectives and make the levy less effective. We make some qualitative comments on these below:

- A parking levy will cause the number of car commuters (and parkers) to fall, which reduces congestion, making driving more convenient. This could lead to induced demand for driving, in two ways. Firstly, CBD commuters who do not currently drive (either because it is too slow/ congested or they can’t guarantee getting a park) might convert to driving and parking, even if this means paying more.
- Secondly, people who don’t need to park in the CBD could be more likely to travel by car because of the clearer roads. This includes people making drop-offs to the CBD or travelling through the CBD and out the other side, or using taxis and ride hailing services like Uber. If the levy was too high, the relative costs of using taxis/Ubbers would be smaller.
- CBD residents could rent out more of their carparks to commuters if they are able to avoid the levy. This threatens the levy objectives and could have the perverse outcome of more parking being built

in apartment developments. Mitigating this, most apartments are in Te Aro and away from the densest employment areas.

- The levy could encourage more people to ‘work from home’ at least some of the time, rather than driving to work. The economic effects of this are unclear, but they are likely to be roughly neutral.
- Some commuters could switch from ‘earlybird’ parking to negotiating carparks as part of their salary package, to help reduce their cost. This would make it harder for them to change their driving habit, as their marginal cost of parking for one extra day is zero.
- Some parking owners may be able to avoid the levy by selling off their parks individually or in chunks of up to 10 (depending on the exemption level). The parks will keep being used by commuters, who won’t have to pay the levy.
- Our preferred levy design focuses on commuters but means that casual prices could actually fall. This will encourage people travelling off-peak (e.g. shoppers, business visitors and other people to drive rather than use alternative travel modes. On the other hand, this could help to compensate for a loss of on-street parking.

8.9 Other Actions to Support the Levy Objectives

There are some other actions which WCC, LGWM and the Government could take to help make a parking levy more successful; most of them would be desirable even without a levy:

- Some WCC carparks are priced at below-market levels, especially Clifton Carpark (as evidenced by the long waiting list for monthly leases) but probably others too, due to the need to have price increases signed off by councillors. Increasing prices to market levels would generate more revenue for WCC, as well as encouraging mode shift.
- The Government is by far the largest employer and ‘building user’ in the CBD. It could take a leadership position in reducing the number of carparks it leases, and the number that it provides to staff for commuting purposes. WCC and GWRC could act similarly.
- Other works proposed in the LGWM programme will reduce on-street (i.e. casual) parking supply. This will have a flow-on effect on off-street parking as well. It is likely that some casual parkers might switch to using parking buildings instead, which would mean fewer carparks available for commuters.
- Consider changes to New Zealand’s Fringe Benefit Tax regime to reduce its distortionary impact (note – this would have implications for our cost estimates in **section 8.1**).
- Consider complementary measures that target taxis/ Uber, or which discourage unnecessary through traffic or drop-offs (this could include road closures, slow streets etc).

8.10 Inputs to TBC Business Case

This section provides inputs to the TBC Economic Case in terms of:

- Other impacts eg equity, business impacts.
- Quantification of forecast benefits.
- Identification of material assumptions and uncertainties affecting benefits realisation.
- Identification and assessment of main risks affecting benefits realisation.

8.11 Conclusions

Levy Costs and Benefits

- We estimate total economic costs of \$1.5 million per year for the levy, assessed in 2036. This is made up of administration costs (\$1.6 million) and deadweight loss from the levy itself (\$1.5 million), which is offset by reduced deadweight loss from the FBT exemption for employer-provided parking (-\$1.6m).

- The estimates of deadweight losses depend on the assumptions used, but we find that the losses from the levy are likely to be largely offset (or even more than offset), leaving the administration cost as the main economic cost. This finding would need to be revisited if the FBT exemption was removed. We estimate congestion reduction benefits of \$2.8 to \$10.4 million, based on some simple 'rules of thumb'. These benefits will be re-evaluated later in the LGWM programme, following additional transport modelling.
- There are many unquantified benefits, including reduced externalities from driving and parking, freeing up road space for more space-efficient travel modes or alternative land uses, liveability and more efficient public transport.
- Any effects on 'Land Use, Economic Competitiveness and Agglomeration' have not been quantified, but are expected to be positive assuming that the levy funds are hypothecated.
- Overall, it is highly likely that congestion reduction benefits alone exceed any economic costs. This means a Benefit Cost Ratio (BCR) of greater than 1 (initial range is 1.9 to 6.9), which is a strong initial argument for a parking levy.
- Lastly, thinking of the levy as a revenue raising tool, we note that funding this revenue from other sources (e.g. general taxation) would create a larger deadweight loss, which is an opportunity cost for those other sources.

Effects on Land Use Patterns, Economic Competitiveness and Agglomeration

- CBD property owners and businesses would bear part of the levy burden, but (assuming levy funds are hypothecated) they also benefit from the funds being reinvested in the CBD, or in ways which improve access to the CBD. Overall, the value of CBD land (and properties) is actually likely to increase, but this will be modelled elsewhere in the LGWM programme.
- Overseas evidence from academic studies, and our own review of economic indicators suggests that the overall economic effects of a parking levy are likely to be positive.
- Using reasonable assumptions, we find that the levy cost is only a very small share of the 'cost of doing business' in the Wellington CBD. It is likely to be more than offset by the CBD's other advantages. This is assisted by the levy funds being used to improve its accessibility further.
- It is highly unlikely that any major displacement of economic activity would occur, as the levy is just 1% of total occupancy costs for a typical office tenant. To the extent that any activity did relocate elsewhere (e.g. a new office building was redirected outside the levy area), this would probably be to elsewhere in the same labour market, i.e. smaller hubs such as Newtown, Kilbirnie or Lower Hutt. There might be some very minor implications for agglomeration, but residents near those areas would also appreciate the local employment opportunities.
- It is extremely unlikely that any major displacement of economic activity would occur to places outside the Wellington region (i.e. Auckland or Christchurch).
- It is quite possible that some workers would work from home some days, rather than driving into work each day. The economic effects of this are uncertain, but likely to be roughly neutral.

Equity

- A parking levy would satisfy vertical equity criteria: it would be predominantly paid by people on higher incomes. Wellington residents, and especially commuters who drive to the CBD, are generally well-placed to bear the levy burden. The median income for people working in the CBD is \$82,000 for drivers, vs \$70,000 for non-drivers.
- Horizontal equity is more complex. Drivers who are passing through, dropping someone off or delivering passengers (i.e. taxi/ Uber drivers) will not pay the levy even though they are contributing to traffic volumes, and this detracts from equity. Drivers who live in certain areas (or who work in certain parts of the CBD) have better alternatives to driving than others.
- Some property owners will bear a larger burden than others, but this is proportionate to their contribution to car commuting. We see this as broadly equitable. Ramping up the levy charge over

several years, as proposed, gives property owners more opportunity to reassess their parking provision.

- The Wellington levy's focus on commuters means that it is appropriate to exclude (short-stay) on-street parking. This would not be equitable in all circumstances, e.g. in the Sydney scheme where short-stay parks are liable if they are off-street but not if they are on-street.
- The equity effects of exempting charitable/ volunteer/ non-profit parking are ambiguous. On the one hand, these groups might be less able to pay. On the other hand, they might still be contributing to peak traffic volumes. Our view is that these carparks should not be exempt.
- The most significant issue for equity, in our view, is that drivers who do not park do not pay. This is a 'free rider' problem. The issue of public/ active transport accessibility can be mitigated by improving access to these areas.
- Despite some issues with horizontal equity, we conclude that overall a parking levy is likely to be broadly equitable.
- Equity can be further improved by exempting disabled spaces; charging a lower rate for Te Aro; looking at complementary measures that target taxis/ Uber; improving non-car access for suburbs where it is currently poor; and giving opportunities for parking owners/ operators to mitigate the levy's impact by keeping carparks empty (or by leaving them available for casual parkers)
- The status quo also has inequities; congestion and high vehicle numbers lead to more noise and air pollution, with the impacts of this mainly felt by CBD residents and those living next to motorways and major roads. This is more likely to affect vulnerable residents, regardless of whether they themselves contribute to congestion.

Unintended Consequences and Other Considerations

- A parking levy could cause the number of car commuters (and parkers) to fall, which reduces congestion, making driving more convenient. This could lead to induced demand for driving, in two ways. Firstly, CBD commuters who do not currently drive (either because it is too slow/ congested or they can't guarantee getting a park) might convert to driving and parking, even if this means paying more.
- Secondly, people who don't need to park in the CBD could be more likely to travel by car because of the clearer roads. This includes people making drop-offs to the CBD, or travelling through the CBD and out the other side, or using taxis and ride hailing services like Uber,
- CBD residents could rent out more of their carparks to commuters if they are able to avoid the levy. This threatens the levy objectives and could have the perverse outcome of more parking being built in apartment developments. Mitigating this, most apartments are in Te Aro and away from the densest employment areas.
- The levy could encourage more people to commute by taxi/ Uber, since the roads would be clearer.
- Some parking owners would be able to avoid the levy by selling off their parks individually or in chunks of up to 10 (depending on the exemption level). The parks will keep being used by commuters, who won't have to pay the levy.
- Our preferred levy design focuses on commuters but means that casual prices could actually fall. This could encourage people travelling off-peak (e.g. shoppers, business visitors and other people to drive rather than use alternative travel modes. On the other hand, this could help to compensate for a loss of on-street parking.

Supporting Measures for a Parking Levy

- Raise parking prices at WCC carparks (especially Clifton) to market levels.
- The Government, WCC and GWRC could reduce the number of carparks they lease, and the number that they provide to staff for commuting purposes.
- Removing on-street parking through other parts of the LGWM programme will mean some casual parkers switch to using off-street parking instead, encouraging carpark owners/ operators to make fewer spaces available for commuters.

- In addition to price-based measures (the parking levy) and behaviour change measures, other measures should be considered to reduce driving during peak times. This could include reallocation of road space.
- Consider changes to the FBT regime to make it more mode neutral.

9.0 IMPLEMENTATION PATHWAYS

9.1 Introduction

This section of the report is prepared by Russell McVeagh. It summarises the work Russell McVeagh has undertaken on the legal considerations for the design and implementation of a commuter parking levy ("CPL") for Wellington, including preliminary key findings and recommendations.

The legal advice in this section is addressed to Wellington City Council ("WCC"), Greater Wellington Regional Council, and Waka Kotahi NZ Transport Agency (being the parties to the Let's Get Wellington Moving joint initiative). It is confidential and legally privileged and should not be disclosed except as required by law or with the consent of those parties.

9.2 Work completed to date.

We have:

- Reviewed the parking levy regimes in Nottingham, Melbourne, Sydney, and Perth. (A summary of findings from that review is set out in **Appendix 9.1**.)
- Drawing on existing New Zealand regimes involving the collection of taxes or levies (eg, the waste disposal levy, and local and regional fuel taxes), considered how a CPL for Wellington might be implemented through a standalone Act of Parliament (or, alternatively, introduced as a new part or subpart of an existing Act), including key design features (see **sub-section 9.3**).
- Considered seeking to implement a CPL for Wellington as a targeted rate but concluded that that is not a preferred option (see **sub-section 9.4**).

Throughout the project to date, we have also engaged with the other advisors and key stakeholders, including providing input on a range of legal queries.

9.3 Preferred implementation pathway: specific enabling legislation

9.3.1 Overview

Our preliminary view is that the preferred implementation pathway for a CPL for Wellington is by way of specific enabling national legislation (a "**Parking Levy Act**"). As described below, this enabling legislation could be introduced as a standalone Act or as part of an existing piece of legislation.

This sub-section of the report summarises:

- why we consider this to be the preferred implementation pathway,
- initial recommendations on the design and content of a Parking Levy Act; and
- potential barriers associated with this preferred implementation pathway, and how these might be addressed.

9.3.2 Why we think a Parking Levy Act is the preferred option.

The international precedents (summarised in **Appendix 9.1**) are all implemented **using bespoke legislation**. That is, they are based on legislation specifically designed to impose a parking levy.

Bespoke legislation which unequivocally authorises the imposition of a CPL would provide the **greatest legal certainty**. We consider there is material legal uncertainty as to whether a CPL could be imposed under any existing New Zealand legislation, including, most relevantly, the municipal rating regime (in the Local Government Act 2002, and the Local Government (Rating) Act 2002 ("**LGRA**")), or the bylaw-making provisions of the Land Transport Act 1998.

In addition, the empowering legislation will need to contain a framework for determining the scope of the CPL (eg, which car parks are intended to be "leviable" under the CPL, and which are to be exempted, and as to the intended geographic boundaries of the "leviable area" (and the necessary degree of flexibility required in respect of these boundaries)). **These considerations (among others) can be most effectively addressed through the enactment of a specific Parking Levy Act, rather than seeking to achieve that flexibility under existing legislation (such as the rating or transport Acts) which were never designed to give effect to a levy like a CPL.**

9.3.3 Legislative design considerations

In designing a Parking Levy Act, it will be necessary to consider:

- Whether it should be a public (ie, nationally applicable) Act or a local Act.
- Scope (in terms of geographic area, type of car parking, and exemptions) and the extent to which these matters should be prescribed in a Parking Levy Act or alternatively left to the relevant local authority to determine.
- Machinery provisions, such as defining who is liable to pay the CPL, return filing obligations, and obligations to keep records, as well as enforcement provisions, such as penalties for non-compliance and powers to require liable persons to furnish information relevant to the CPL.
- Whether consequential amendments may be required to other Acts (for example, to clarify the GST treatment of the CPL).
- The extent to which a Parking Levy Act should provide for hypothecation of parking levy revenue or proceeds for particular purposes.

Our comments below, on each of those points, draw upon the international precedents we have reviewed, as well as existing New Zealand regimes involving the collection of levies.

9.3.4 Public Act or local Act?

Local Acts deal with matters confined to a particular locality. If a Parking Levy Act were a local Act, it could, therefore, allow WCC to specifically impose a CPL for Wellington.

A local bill must be promoted and drafted by a local authority (a territorial authority or regional council). This could have some advantage over a public Act in that WCC would have greater control over the Act's design and drafting.

An example of a local Act that allows a local authority to impose a levy within its region is the Wellington Regional Council (Stadium Empowering) Act 1996. Section 5 of that Act allows the Greater Wellington Regional Council to make and levy a "stadium purposes rate" to meet the annual costs of its contributions to the funding of the stadium. The provisions of the LGRA (and other municipal rating Acts) generally apply to a stadium purposes rate as if it were a targeted rate set and assessed under the LGRA.

A disadvantage of a local Act, however, is that it could be viewed as an inefficient use of Parliament's time, since the enactment process would need to be repeated if a different local authority wished to impose a parking levy in future. In addition, Central Government may be reluctant to set a precedent of supporting the imposition of whatever new levies or taxes a particular local authority might wish to collect.

Accordingly, a public Act, which allowed for any local authority (ie, not just WCC) to "draw down" on and impose a parking levy in their jurisdiction would seem preferable. Further, this approach would be consistent with that in the United Kingdom's Transport Act (see below). The model being considered for Wellington is a levy on commuter car parking only, and our comments below focus on a CPL accordingly. The Act could, however, empower local authorities to impose parking levies more generally.

If it were not possible to secure support for a Public Act (for example, because of constraints in the Central Government legislative agenda), consideration could be given in future to imposing a CPL for Wellington by way of a local Act, since a local Act would be just as effective a mechanism for imposing a CPL specifically for Wellington.

9.3.5 How should the scope of the CPL be reflected in a Parking Levy Act?

We recommend that a **Parking Levy Act empower WCC (and other local authorities) to choose to impose a parking levy, and to retain control over some of its key features**. It is desirable for local authorities to be allowed to choose whether to impose a parking levy within their boundaries. There has been no suggestion of a "nationwide" parking levy mandated by Central Government. Further, it would be desirable for local authorities to have some autonomy over key features of the parking levy, eg, in setting the boundaries of the "leviable area", and in providing for necessary exemptions unique to their areas.

Given this, the United Kingdom model appears the most relevant of the international precedents. As summarised in **Appendix 9.1**, the Transport Act 2000 (UK) empowers any local authority in the United Kingdom to create a "licensing scheme ... for imposing charges in respect of the provision of workplace parking places" within their jurisdiction. By contrast, in the case of the Australian precedents, each state has its own legislation to give effect to its parking levy, reflecting the federal system of Government under which states have authority to legislate state taxes.

In addition, there is precedent already in New Zealand for regional or local taxes which reserve some autonomy to the relevant local authority. These are the regional fuel tax ("**RFT**"), and the local authorities fuel tax ("**LAFT**") (see **Appendix 9.2** for further details).

Given these domestic and international precedents, we consider that a Parking Levy Act could:

- empower any local authority (eg, WCC) to impose a parking levy on all eligible car parks within its boundaries.
- contain a corresponding power for the relevant local authority to exempt certain areas from the levy (ie, set the geographic boundaries in respect of which the levy is leviable).
- contain embedded exemptions from any levy, eg, for residential car parks, and car parks required for operational reasons (see further below); and
- allow for a local authority to set the rate of the levy, potentially on a differential geographic basis. This could be achieved by allowing a local authority to choose from a set of prescribed rates (or bands), or by capping the rate at which a levy could be set, with discretion for the local authority to impose the levy at any differential rate(s) thereunder.

From our review of the international parking levy regimes (summarised in **Appendix 9.1**), we have observed some common themes so far as exemptions are concerned. These are for:

- residential parking.
- on-street parking.

- disabled parking.
- motor cycle parking.
- loading zones.
- business visitor parking.
- hospital parking.
- emergency vehicle parking.
- parking provided at religious/charitable institutions/organisations.
- hotel/motel parking.
- garaging of fleet vehicles (eg, buses).
- parking for persons attending "special events"; and
- display parking (eg, vehicles on display at car dealerships).

Other examples of more "bespoke" exemptions include for:

- consulates (Melbourne).
- employee parking provided at enterprises which operate 24/7 (Melbourne); and
- customer parking at retail stores, restaurants, funeral parlours and registered clubs (Sydney ("Category 2" areas only)).

The regimes in both Perth and Nottingham also contain de minimis exemptions for parking facilities with fewer than six or 11 car parks, respectively.

Some of the so-called exemptions included in the international precedents may, in the case of a CPL for Wellington, not be exemptions as such, but rather inherent in the CPL's scope. As the intended levy is to be a CPL, it would not (for example) apply to residential parking (except potentially where used for commuter parking), emergency vehicle parking, or display parking.

In respect of a CPL for Wellington, the recommended scope and exemptions are set out in **section 6** of the report. From a legislative design perspective, we would recommend that a Parking Levy Act:

- include certain "base-line" exemptions in which Central Government has a particular interest (such as exemptions for the premises of a diplomatic mission, and for car parking required for operational purposes of emergency services and Central Government agencies); and
- provide a framework for the local authority (here WCC) to allow other exemptions.

9.3.6 Hypothecation

If it is considered desirable for proceeds from a parking levy to be hypothecated (eg, to the funding of public or active transport mode initiatives, or related capital spending), this could be included in a Parking Levy Act. If the parking levy proceeds were to be hypothecated, careful consideration would need to be given as to how this process could be managed and who would be responsible for doing so. Options for this would include the relevant local authority, a central government agency, or a combination of both.

There is precedent for ring-fencing of the revenue from parking levies in the overseas models (see the Proceeds column of **Appendix 9.1**). There is also New Zealand precedent for hypothecation under both the RFT regime, and the waste disposal levy framework (in the Waste Minimisation Act 2008, and Waste Minimisation (Calculation and Payment of Waste Disposal Levy) Regulations 2009):

- For RFT, funds received by the relevant regional council must be held in a reserve fund and spent only in support of the programme of capital projects identified in the initial proposal to introduce the RFT scheme.

- For the waste disposal levy, the share of the levy proceeds received by the relevant territorial authority may be spent only on matters to promote or achieve waste minimisation, and in accordance with its waste management and minimisation plan.

(See **Appendix 9.2** for further details).

9.3.7 What machinery provisions would be required to effect collection and enforcement?

A Parking Levy Act would need to provide for car park owners/operators to file periodic returns containing information (such as the number of leviable car parks on their premises) from which liability for a parking levy could be calculated. It would also require machinery provisions as to when the levy is payable, information powers to enable returns to be audited where necessary, and penalties for non-compliance.

Again, there is precedent in existing New Zealand regimes for provisions of this nature. As well as the LAFT and RFT regimes already mentioned, the waste disposal levy framework may provide a helpful precedent on these matters (see **Appendix 9.2** for further details).

Additionally, consideration will need to be given to the practical and legal measures required to protect any personal information gathered in the administration of a parking levy, including any obligations under the Privacy Act 2020. However, we would not expect this to pose a significant hurdle in the implementation of a CPL for Wellington.

9.3.8 Whether consequential amendments may be required to other Acts (eg, to clarify the GST treatment of a parking levy)

A parking levy would itself likely be subject to GST on the basis it is consideration for a taxable supply. This would be consistent with the treatment of the waste disposal levy and the RFT, each of which is expressly deemed by section 5 of the Goods and Services Tax Act 1985 to be consideration for a taxable supply. We would expect Inland Revenue and The Treasury to recommend that any parking levy also be deemed to be consideration for a taxable supply (and therefore subject to GST), and that a deeming rule similar to those for the waste disposal levy and the RFT be enacted in relation to the parking levy.

9.3.9 Potential barriers to implementation

As with any legislative reform proposal (especially one that may result in the imposition of a new tax or levy), securing political and public support will be important. Among other things, it will be necessary to consider the intersection with any consultation requirements under the Local Government Act 2002.

It is worth noting in this context that tax measures affecting the cost of car parking have proved contentious in the past: a plan to extend fringe benefit tax ("FBT") to employer-provided car parking in the Auckland and Wellington CBDs was withdrawn in 2013 following political pressure. Central Government will no doubt be mindful of similar sensitivities in respect of a possible CPL.

One way in which a Parking Levy Act can respond to these considerations is by allowing (within appropriate parameters) the relevant local authority to choose whether to impose a parking levy and at what rate and within what boundaries (as discussed above). In this way, imposition of a parking levy will be a matter for the local authority to decide on, taking into account community input, rather than being imposed by Central Government.

A further issue to be managed will be in determining scope and appropriate exemptions. A CPL in Wellington has the potential to impose additional costs on Central Government in respect of Government agencies that use car parks in the Wellington CBD.

Managing this issue will require careful consideration of appropriate exemptions (eg, for car parks required for operational reasons). Because it is also important that exemptions are not too broad, a Parking Levy Act would need to provide a framework to allow new and targeted exemptions in compelling cases that arise once a CPL is in place.

9.3.10 Alternative to standalone Parking Levy Act: new part or subpart to existing legislation

Our comments in this **sub-section 9.3** above have proceeded on the basis that the Parking Levy Act would be a standalone Act of Parliament. If this were not feasible, or if it were considered more expedient to do so (eg, in the interests of securing higher priority in the legislative programme, or because of support from a particular Minister or Ministry, or on the advice of the Parliamentary Counsel Office), it could be possible to enact the enabling parking levy legislation as a new part or subpart of an existing Act, eg, the Land Transport Act 1998, Land Transport Management Act 2003, the Local Government Acts or the LGRA. (We discuss why we do not consider the latter to be appropriate below.) For instance, if an amendment bill were being proposed in any event for one of those existing Acts, that amendment bill could become the vehicle for introducing a new part or subpart containing the provisions empowering the imposition of a parking levy.

The Land Transport Act 1998 currently empowers road controlling authorities (which includes WCC), to promulgate bylaws in relation to parking within their jurisdiction. It is under this legislation that WCC made the relevant section of the Wellington Consolidated Bylaw 2008 relating to parking. This part of the bylaw provides for Wellington's existing residents and coupon parking schemes. However, we note that the current parking bylaw-making powers under the Land Transport Act cover parking spaces provided on roads, or on other council-owned/controlled premises, ie, not for private, off-street car parks. Additionally, it does not appear that such bylaw-making powers could currently be directed at the use of a levy at a level intended to raise significant revenue and/or change commuter behaviour. Accordingly, the bylaw-making provisions under this Act would need to be amended to provide for the imposition of a levy like the CPL. We also note that a parking levy regime does not fit neatly within the stated purposes of the Land Transport Act, which include to promote safe road user behaviour and vehicle safety (see the long title of the Act), and so it may not necessarily be a natural fit as a home for the levy.

The other existing Acts noted above are those which contain the RFT and LAFT regimes, respectively. As such, they are examples of legislation already providing for the levying of taxes of a broadly similar nature to the proposed CPL for Wellington, alongside which the enabling parking levy legislation could potentially sit.

9.3.11 Summary of recommendations on Parking Levy Act

In summary, we make the following recommendations regarding the key features of a Parking Levy Act under which a CPL for Wellington could be imposed:

- A Parking Levy Act should be a public Act rather than a local Act, although if the preference of Central Government were for a local Act, a local Act should be just as effective a mechanism for implementing a CPL for Wellington.
- If it were considered more desirable and/or expedient to do so, the enabling parking levy legislation could also potentially be introduced as a new part or subpart of an existing Act, such as the Land Transport Act 1998, Land Transport Management Act 2003, or Local Government Acts, rather than being a standalone Act of Parliament. (If this approach were adopted, the decision as to which existing statute would be the most appropriate would turn on factors including the Central Government legislative agenda, any support from a particular Minister or Ministry, and views of the Parliamentary Counsel Office.)
- A Parking Levy Act ought to empower WCC (and any other local authority who chose to do so) to impose a parking levy on all eligible car parks within its jurisdiction.

- It should contain a corresponding power for local authorities to exempt certain areas from a levy (ie, set the geographic boundaries in respect of which the levy is leviable).
- A Parking Levy Act should contain embedded exemptions, eg, for residential car parks, Embassy/High Commission car parks, and car parks occupied by Central Government operational vehicles.
- It ought to allow for a local authority to set the rate of the levy, potentially on a differential geographic basis. This could be achieved by allowing the local authority to choose from a set of prescribed rates (or bands), or by capping the rate at which the levy could be set, with discretion for the local authority to impose the levy at any differential rate(s) thereunder.
- It will need to provide for the administrative and enforcement aspects of the levy, eg, requiring car park owners/operators to file periodic levy returns, with penalties for non-compliance. The administrative and enforcement provisions of the Waste Minimisation Act and Regulations may be a useful precedent as to these matters.
- If hypothecation of the proceeds from the levy is desired, this could be provided for in a Parking Levy Act.

A consequential amendment to the GST Act may be necessary to confirm that the levy is consideration for a taxable supply, and therefore subject to GST. This would be consistent with the approach taken for similar levies and taxes, such as the waste disposal levy and the RFT, which are expressly deemed to be subject to GST.

9.4 Alternative implementation pathway: targeted rate (via amendments to municipal rating regime)

9.4.1 Overview

As discussed in the previous sub-section, we consider the preferred implementation pathway for the imposition of a CPL for Wellington is under a Parking Levy Act. We also considered the possibility of introducing a CPL as a targeted rate under the existing rating legislation. For the reasons set out below, we did not consider that the targeted rate was the preferred option.

In summary, municipal rates are a levy on land, whereas the CPL is intended to be a levy on the particular activity of commuter car parking. This makes a targeted rate an unsuitable means of imposing a CPL for Wellington, which is intended to be a charge on certain uses of car parks, ie, on the activity of commuter car parking (rather than on the land on which that activity is carried out). In any event, there is also material legal uncertainty as to whether a CPL could be imposed under the current rating legislation. Further, the rating legislation does not provide the necessary flexibility for determining (and refining over time, as issues arise) the scope of a CPL and necessary exemptions.

9.4.2 Issues with existing municipal rating regime explained.

First, rates are a charge against land. A targeted rate can be set differentially based on the nature/use of a rating unit. However, a CPL for Wellington is not intended to simply be a charge on car parks within the catchment area generally. Rather, a CPL for Wellington is intended to cause modal shift by imposing a charge on the particular *activity* of commuter car parking. Accordingly, we do not consider a targeted rate – which would necessarily be directed towards the rating units within the catchment area, rather than the activity carried out thereon – to be an appropriate mechanism for seeking to impose a CPL for Wellington.

Second, there is legal uncertainty as to whether a CPL for Wellington could be imposed under the LGRA as it stands. Schedule 3 of the LGRA contains an exhaustive list of factors in relation to which liability for any targeted rate may be calculated, including, for example:

- the land/capital value of the relevant rating unit.

- the number or nature of connections from the land within a rating unit to any local authority reticulation system; and
- the number of water closets/urinals within a rating unit.

The only factor in Schedule 3 which, on its face, could potentially allow for a targeted rate based on the number of car parks is clause 7: "the number of separately used or inhabited parts ["SUIPs"] of [a] rating unit". **It is uncertain in our view whether car parks would qualify as "SUIPs" of a rating unit:**

- Car parks are not ordinarily physically distinct areas or components of a premises. At most, car parks may be delineated by painted lines or signposting but will usually not be physically separate.
- Car parks will ordinarily be occupied only on an intermittent basis. The New Zealand Court of Appeal has held that motel units did not constitute "separately occupied portion[s]" of a building, given that their "succession of short, temporary, and broken uses" lacks the necessary "degree of permanence or continuity" (see *Marlin Motels (1971) Ltd v Picton Borough Council* [1980] 1 NZLR 522 (CA)). We note this case was decided on the basis of a predecessor provision to Schedule 3 of the LGRA which is not identically worded (the Municipal Corporations Act 1954 used the term "separately occupied portion[s]" of a building, rather than "separately used or inhabited parts" of a rating unit). Nonetheless, there are similarities between the difficulties the Court highlighted in treating motel units as "separately occupied portion[s]" of a building, and the difficulties that might arise in using a targeted rate to achieve the objects of a CPL. In both cases, it is difficult to determine whether the unit should be subject to the targeted rate as the unit's occupation is intermittent and may vary from day to day. Further difficulty arising in the case of the CPL is that it would be necessary to distinguish, potentially day to day, between different types of parking, ie, whether a particular car park was being used for commuter or other car parking.
- Within Schedule 3, Parliament has chosen to expressly legislate factors for calculating liability for a targeted rate pertaining to the number of specific features/attributes of a rating unit, eg, the number of water closets/urinals. The specificity of these factors, as against the other, more general Schedule 3 factors, could suggest that, had Parliament intended for something as specific as the number of car parks within a rating unit to be a permissible factor for calculating liability for a targeted rate, it would have expressly legislated to that effect.

Third, **the municipal rating regime is not calibrated to address other key considerations for a CPL.** As identified in **sub-section 9.3.3**, there are a number of specific considerations which are unique to the design and implementation of a CPL, eg, the need for a range of exemptions. We also note the desire for the levy to be "passed on" to commuters (rather than lying with building owners/car park operators) to drive modal shift. At present, we consider the municipal rating regime would not provide sufficient flexibility to address these issues. On a related note, **certain car parks within the Wellington CBD are situated on fully/50% non-rateable land** (pursuant to Schedule 1 of the LGRA). This might further limit the ability to impose a CPL under the rating legislation.

9.5 Other issues

9.5.1 Fringe benefit tax settings

Although not directly within the scope of the proposed CPL for Wellington, we have been asked to comment on the current income tax treatment of employer-provided car parking, since it is relevant to assessing the likely impact of a CPL on commuter behaviour.

Ordinarily, non-cash benefits provided in connection with employment are subject to FBT, which is payable by the employer. An exemption from FBT applies for any benefit provided on the employer's premises. It has become usual practice for employers to lease car parks that are provided to their employees, even when the car parks are (for example) in a car parking building separate from the employer's other premises. Inland Revenue has accepted that the provision of car parks leased by the employer will qualify for the on-premises exemption from FBT.

It is common for car parks to be provided as part of an employee's package, such that an employee that wishes to have an employer-provided car park will accept lower cash remuneration in return. For example, an employee on a \$100,000 package might elect to receive a car park valued at \$4,500 and a salary of \$95,500. The car park is tax free, and therefore the after-tax cost to the employee (assuming a 33% tax rate) is \$3,015, since \$3,015 is the after-tax amount the employee would have received had the employee received an additional \$4,500 in salary rather than the car park.

By contrast, the provision of other travel-related employment benefits, such as subsidisation of an employee's public transportation or active transport mode (eg, employer subsidies of scooters or bikes) costs, will generally be taxable to the employee (under the PAYE system) or subject to FBT. The current treatment of car parking benefits therefore seems anomalous, which was one of the reasons why the Government, several years ago, explored extending FBT to certain car parking benefits. As noted above, that proposal was withdrawn due to political pressures at the time.

If it were considered desirable to address this seemingly anomalous income tax/FBT treatment of car parks compared to (eg) contributions to public or active transport costs, an easier path (from a political perspective) might be to examine the case for exemptions from FBT for the provision of public transport subsidies to employees. This would require input from both Inland Revenue and The Treasury, however, and at this point we are not aware of either Inland Revenue or The Treasury seeing the issue as a priority.

9.5.2 Implications for existing parking arrangements

Our work has focussed on implementation options and design considerations for the imposition of a CPL within a leviable area. While this will have obvious implications for car parking within the leviable area, we also recognise that there are likely to be implications for areas outside the leviable area. For example, a CPL for Wellington could result in "spillover" of parking to zones immediately adjacent to the leviable area. There may be policy, and potentially legal, changes that need to be made to ensure that parking in these areas does not undermine the objectives of the CPL. The need for changes relating to areas immediately adjacent to the leviable area is outside the scope of this report and would require further work to be undertaken.

9.6 Summary of key findings and recommendations

Our preliminary view is that the preferred implementation pathway for a CPL for Wellington is by way of specific enabling national legislation. Bespoke legislation which unequivocally authorises the imposition of a CPL would provide the **greatest legal certainty**. We consider there is material legal uncertainty as to whether a CPL could be imposed under any existing New Zealand legislation, including, most relevantly, the municipal rating regime. In any event, the rating legislation would not at present provide sufficient flexibility to achieve the objects of a CPL.

We make the following recommendations regarding the nature and substance of a Parking Levy Act:

- It should be a public Act rather than a local Act, although if the preference of Central Government were for a local Act, a local Act should be just as effective a mechanism for implementing a CPL for Wellington.
- If it were considered more desirable and/or expedient to do so, the enabling parking levy legislation could also potentially be introduced as a new part or subpart of an existing Act, such as the Land Transport Act 1998, Land Transport Management Act 2003, or Local Government Act 1974, rather than being a standalone Act of Parliament. (If this approach were adopted, the decision as to which existing statute would be the most appropriate would turn on factors including the Central Government legislative agenda, any support from a particular Minister or Ministry, and views of the Parliamentary Counsel Office.)

- It ought to empower any local authority that chooses to do so to impose a parking levy on all eligible car parks within its jurisdiction and contain a corresponding power for local authorities to exempt certain areas from any levy.
- It should contain embedded exemptions from any levy for certain uses.
- It ought to allow for a local authority to set the rate of the levy, potentially on a differential geographic basis.
- It will need to provide for the procedural and enforcement aspects of administering the levy.

A consequential amendment to the GST Act may be necessary to confirm that payment of the levy is consideration for a taxable supply, and therefore subject to GST.

9.7 Further work to be done.

We consider that the key next steps, from a legal perspective, will be to:

- **develop a Central Government engagement strategy** to test the level of support for, and any Central Government concerns regarding, the proposal to implement a Parking Levy Act.
- provide input (working with the relevant Ministries) on the design and drafting of a Parking Levy Act, or, if Central Government prefers that the Act be a local Act, drafting that Act; and
- design the Wellington specific elements of the CPL (eg, setting the rates, determining boundaries, and appropriate exemptions).

10.0 IMPLEMENTATION ROUTE MAP

Parking Levy implementation Route Map and indicative timescales

In terms of implementation of the Wellington Commuter Parking Levy we consider there will be would essentially be 3 main stages (which run sequentially) to implementation:

- Scheme development through to Business Case approval.
- Stakeholder/public consultation through to approvals.
- Implementation through to operation

Key tasks for each of these stages are summarised below (with indicative timescales highlighted):

Scheme development through to Business Case approval (12 months)

- Further support studies eg WTSM, financial and economic modelling all updated.
- Measures and monitoring existing situation eg on street parking audits and parking audits/management schemes developed where displaced parking predicted.
- Parking Levy scheme development eg tailored design, operational review, communications plan.
- Parking Levy legislation/regulatory scheme development and ongoing communications with Ministries.
- Identification of how Parking Levy revenue will be used to fund LGWM work packages.
- Project Management – eg risk management, governance stakeholder and communications management.
- Evaluation of impact of Parking Levy eg monitoring of parking market trends post introduction of the Parking Levy

Stakeholder/public consultation through to approvals (18 months)

- Consultation on Parking Levy Draft Act through to Ministerial approval.
- Public Consultation preparation eg materials and programme.
- Carry out public consultation eg events.
- Parking Levy approval eg business case, WCC approvals, LGWM Board approvals.
- Parking Levy scheme development eg detailed scheme design, specification and procurement.
- Ongoing project management.

Implementation through to operation (12 to 18 months)

- Parking Levy Draft Act consented.
- Parking Levy implementation eg education and engagement, communications/marketing, IT front and back-office support, Parking Levy management and enforcement team recruitment and training, Parking Levy equipment and infrastructure, operational policies and procedures.

- Parking Levy scheme goes live – recommend no charge for first 6 months to allow licensing of all leviabile spaces to take place.
- Parking Levy charging commences after 6 months (to provide enough time to allow WCC to work with off street car park occupiers/operators to ensure they have obtained a Parking Levy licence and are licensed correctly) - eg compliance, enforcement, business support, ongoing communications – at this point Parking Levy costs would be funded by the Parking Levy revenue stream.
- Ongoing project management.
- Ongoing communications.
- Ongoing monitoring and evaluation.

The Parking Levy is likely to take 4 years to implement depending on the time taken for the Draft Parking Levy Bill and Wellington specific Order to be approved. This is considered ambitious but achievable. As such the earliest start year for the Parking Levy is 2025 and this is what has been assumed in the Financial Modelling. The interaction of these timelines with those for the LGWM programme will need to be explored in future studies.

The Nottingham scheme took longer (due to Government requirement to not implement for 2 years from approval of Legal Order) as outlined below:

- 2007 - business case, public consultation, public examination and Council Executive Board approval to proceed with developing the scheme.
- 2008 WPL scheme business case updated, draft Legal Order and business case submitted for approval.
- 2009 Legal Order confirmed, with a condition to include a two-year delay before introduction and a six-month period with 100% discount on licences.
- 2010 scheme operational activities e.g. online registration system, front and back-office IT, developed.
- 2011 City-wide communications campaign, programme of business support offered to businesses around travel planning and parking management, 3-month period allowing workplace parking places registration.
- 1st October 2011 - Introduction of WPL scheme (no charge) commenced.
- 1st April 2012 - employers were legally required to renew their WPL licences and charging commenced.

Suggested future work actions on the Parking Levy are summarised in **Appendix 10.1**.

Appendices

Appendix 3.1

Review of LGWM and Partners Key Strategy Documents

Relevant National Transport Strategy Documents include:

Government Policy Statement (GPS) on Land Transport 2021 (final version released September 2020) - sets out the government’s priorities for expenditure from the National Land Transport Fund over the next 10 years. The GPS 2021 prioritises safety, better transport options, improving freight connections, and climate change.

Arataki is Waka Kotahi’s 10- year view of what is needed to deliver on the government’s current priorities and long-term outcomes for the land transport system. This identifies a number of inter-related step changes, including Urban Mobility. This highlights the urgent need to shift from reliance on single occupancy vehicles to more sustainable transport solutions for the movement of people and freight.

Keeping Cities Moving is Waka Kotahi’s overall national mode shift plan. It details a series of actions for Waka Kotahi to pursue and outlines a best practice approach based around the integrated use of three key levers outlined in the table below (with that relevant to the Parking Levy highlighted):

Shaping urban form	Making shared and active modes more attractive	Influencing travel demand and transport choices
Encouraging good quality, compact, mixed-use urban development will result in densities that can support rapid/frequent transit (and vice versa), shorter trips between home and work/education/leisure, and safe, healthy and attractive urban environments to encourage more walking and cycling	Improving the quality and performance of public transport, and facilities for walking and cycling will enable more people to use them. This can involve both optimising the existing system (eg, through reallocating road space), investment in new infrastructure and services, and providing better connections between modes.	Changing behaviour may also require a mix of incentives and disincentives (or ‘push’ and ‘pull’ factors) to either discourage use of private vehicles (by making them less attractive than other options) or making people better aware of their options and incentivising them to try something new. This may include parking policies, road pricing, travel planning and education.

Relevant Regional Strategy Documents include:

Let’s Get Wellington Moving (LGWM) - Let’s Get Wellington Moving (LGWM) is a joint initiative between Greater Wellington Regional Council, Wellington City Council, and the NZ Transport Agency to address transport and urban development issues to and through central Wellington city. A key objective of the LGWM programme is to reduce traffic in central Wellington city. LGWM provides strategic direction through the Programme Business Case to guide investment in the Wellington transport system. LGWM is recognised in the GPS 2021 as a Government commitment that has specific investment expectations. As identified in the May 2019 LGWM Recommended Programme of Investment (RPI), the LGWM programme seeks to deliver a multi-modal transport system that moves more people, goods and services reliably, with fewer vehicles.

The Parking Levy stated objective of encouraging mode shift (away from private vehicles) will contribute to the LGWM Programme Objective of reduced reliance on private vehicles and the associated System Occupancy Key Performance Indicator (KPI). This KPI is shown in the LGWM images below and looks to achieve a mode shift from 38% of people driving to work in the inner city in 2016 to 25% by 2036 in the morning peak. This will result in a reduction in the number of private cars entering the city by 6,000, by moving people onto public transport and active modes and increased car occupancy due to pricing. It will

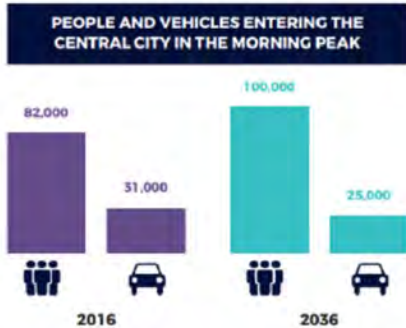
achieve this by building more capacity or reallocating road space to these modes and the shift will be accelerated, supported and boosted by the Travel Behaviour Change package including the Parking Levy.



SYSTEM OCCUPANCY

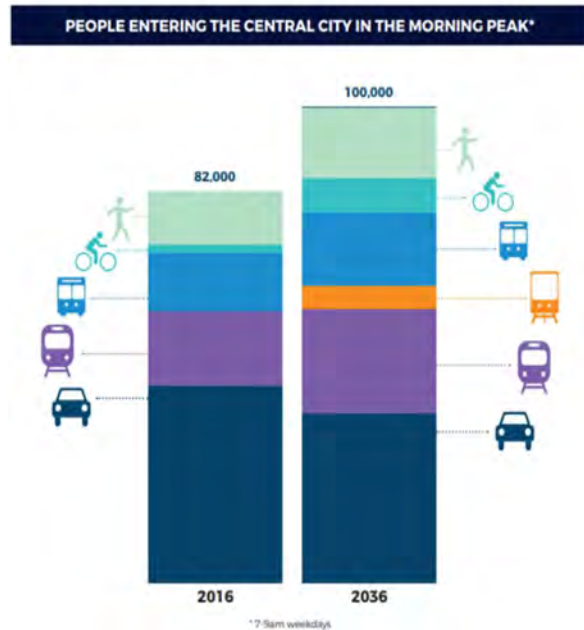
The ratio of people entering the central city (by all modes) against the number of vehicles entering the central city

System occupancy will increase due to more use of public transport, walking and cycling, fewer vehicles entering the central city, and increased car occupancy due to pricing.



REDUCING RELIANCE ON PRIVATE VEHICLES

18,000 more people are forecast to travel into the central city with 6,000 fewer cars.



Although not a stated objective of the Parking Levy, it should be noted that the Parking Levy will also contribute to the LGWM Liveability Programme Objective and the Carbon Emissions KPI of reducing emissions per person in the CBD from a base of 100 in 2013 to 33 in 2036 (as shown in the LGWM image below). The RPI document indicates that emissions are projected to decline due to changes in the vehicle fleet (fuel efficiency and electric vehicles) and the programme contributes a further 18% reduction in emissions within the CBD with road pricing having the biggest impact on emissions.

A Parking Levy is not road pricing, but it is expected to have a similar downward impact on emissions, dependent on the proportion of vehicles impacted by the imposition of a parking levy (i.e. not all vehicles using the roads park).

Regional Land Transport Plan 2021 is currently in development, with consultation concluded, and the draft strategic front end has a high focus on mode shift, including:

- Vision: a connected region, with safe, accessible and liveable places – where people can easily, safely and sustainably access the things that matter to them – and where goods are moved efficiently, sustainably and reliably.
- Headline target: 30% reduction in transport generated carbon emissions by 2030; 40% increase in active travel and public transport mode share by 2030.
- Strategic objectives including:
 - People in the Wellington region have access to good, affordable travel choices.
 - Transport and land use are integrated to support compact urban form, liveable places and a strong regional economy.
 - The impact of transport and travel on the environment is minimised.
- 10-year transport investment priorities including:
 - Build capacity and reliability into Wellington Region’s rail network and into the Wellington City public transport including with additional mass rapid transit network within Wellington City to accommodate future demand.
 - Make walking, cycling and public transport a safe, sustainable and attractive option for more trips throughout the region.

Wellington Regional Growth Framework – this is a spatial plan (Options Report currently being developed) that will describe a long-term vision for how the region will grow, change and respond to key urban development challenges and opportunities. It has considered a number of scenarios and urban form options for how the region may grow. The Framework will identify where housing, public transport and road, three waters infrastructure, businesses and jobs are recommended in the context of climate change, resilience and natural hazards as well as the aspirations of mana whenua. Its objectives are broader than transport but reinforce both national direction and that emerging from the draft RLTP 2021. It is envisaged that changes will be required to some planning settings to align with the Wellington Regional Growth Framework and give effect to the National Policy Statement on Urban Development Capacity.

Wellington Regional Mode Shift Plan - The Wellington Regional Mode Shift Plan sets out how the region can increase the share of travel by public transport, walking and cycling. It supports the national mode shift plan ‘Keeping Cities Moving’ developed by Waka Kotahi. The mode shift plan sets out the focus areas in more detail as they relate to each of the three levers articulated in Keeping Cities Moving:

- Shaping urban form.
- Making shared and active modes more attractive.
- Influencing travel demand.

Under the influencing travel demand, “*Progress the LGWM Travel Behaviour Change and Parking Levy investigations,*” is stated as one of the focus areas. The Mode Shift Plan notes that “*if well designed, a parking levy can target commuters and encourage use of active modes or public transport. The inclusion of some exemptions and concessions, like in Melbourne, such as for residential and disabled parking, and spaces provided free of charge for visitors and patients, would give more equity.*”

Smarter Connections - A strategy for park and ride in the Wellington region (November 2018) - This document outlines a new strategy for park and ride in the Wellington region. It describes GWRC strategic intentions and implementation priorities for park and ride. In doing so, the strategy is designed as a framework to assist decision makers and officers, when considering choices around park and ride, and station access in general. In the contexts of the Parking Levy this strategy offers an alternative to CBD commuter parking.

Wellington CBD Cordon Survey 2001-2019 (GWRC 2019) - This report indicated that between 2000-2019 changes in terms of modes used to cross the selected points around the CBD were:

- Active modes = increase of 31.7%.
- Public transport passengers = increase of 44.4.%.
- People in private motor vehicles = reduction of 17% (vehicles decreased by 13.2%.

Relevant WCC Strategy Documents include:

WCC District Plan - Currently, the District Plan has no minimum car parking rules in some areas including the central city, business (mixed use and industrial) and centres zones. A developer or landowner can choose to provide car parking if desired, in response to market demand. On 23 July 2020, the Government gazetted the National Policy Statement on Urban Development 2020 (NPS-UD). It came into effect on 20 August 2020 replacing the National Policy Statement on Urban Development Capacity 2016. The NPS-UD states that a territorial authority, such as Wellington City Council, must change its district plan to remove any effect of requiring a minimum number of car parks to be provided for a particular development, land use, or activity, other than in respect of accessible car parks. This includes objectives, policies, rules and assessment criteria. These changes must be made within 18 months of the NPS-UD coming into effect. This means for future new development in the city, including outside of the central city, there will be no minimum off-street parking requirement, except for accessible car parks.

Wellington City Council Parking Policy 2020 - Adopted August 2020 (plus accompanying supporting documents including):

- Parking Policy 2020 Statement of Proposal (March 2020).
- Parking Policy Review – Background and Information and Issues report (Jan 2020).
- Smarter Ways to Manage City Parking (Nov 2019).
- Wellington City Council Parking Survey (Nov 2019).

The final parking policy was adopted by the full Council on 26 August 2020. The parking policy sets the objectives and principles for the management of Council controlled on-street and off- street parking, and how parking supports achieving the vision for Wellington. It covers Council-controlled off-street parking, mobility parking, car share parking, loading zones, taxi stands, short-stay parking, parking for residents, buses and coaches, motorcycles, electric vehicle charging and on-street parking for bicycles and micro-mobility (eg e-scooters).

The WCC parking policy indicates that there are circa 28,800 car parks. This includes residential and retail parking which when removed for comparison with the Parking levy study gives:

- 13,500 private car parks.
- 11,200 public car parks (private operators).
- 830 public car parks (WCC operated).
- 3,270 on street metered car parks.

Section 5 of this Report provides an update to these figures which have been used in this report (based on more up to date data) and a summary is shown in **Table 3.1** below:

Table 3.1 – Comparison of WCC Parking Policy and Parking Levy derived off street CBD car park totals.

	WCC Parking Policy	2020 (Parking Levy)
Off street Public car parks (WCC and private operators)	12,030	10,094
Off street Private car parks	13,500	11,956
Total off street private and public car parks	25,530	22,050

WCC have also indicated that there are 3,656 coupon spaces predominantly outside of the CBD (at Clifton, Kelburn, Mount Cook, Mount Victoria, Te Aro and Thorndon). All-day coupon parking is \$12 per day which is the same or only a few dollars more than many return bus and rail fares.

The Parking Policy notes that challenges include “*conflicting public views. There is wide public support for a more pedestrian and bike-friendly city, at the same time wanting more and cheaper parking. While some people feel that parking is over-priced, others believe pricing is not high enough. Residents’ survey results show dissatisfaction with parking availability, and feedback on the Let’s Get Wellington Moving work programme shows a split in opinion between those who want more and cheaper parking versus those who support less parking and using more active and public transport. There have been long periods of time between changes to parking fees and it is not clear how those fees have been calculated or what the outcome is from the price change. This has contributed to the “politicising” of parking pricing, the willingness to pay more for parking, and the disconnect between people’s expectation of the price of parking versus the reality*”.

The policy recognises that the Council is not the only provider of parking and that when the Council makes parking management decisions, it will need to consider private parking supply, how it is managed and the Council's role to address the gaps in the overall parking market. Active modes of transport, such as walking and cycling, and public transport have the highest priority. This means that when users are making decisions on using road space, they take a higher priority to parking. This is reflected in the parking priorities set out in the parking policy. The Parking Levy is complementary to many of the objectives and measures within the Councils Parking Policy and is a key measure to support the Parking Policy, including how parking is prioritised and managed both in the CBD and the CBD fringe/residential streets (for example in terms of how any overspill/displaced parking from the Parking Levy is managed).

The Parking Levy needs to be supported with a strong complementary parking policy, reduced or reallocated on street parking and improvements in public transport and active travel. The new parking policy must actively manage the on-street parking supply to ensure that the Parking Levy and parking policy are consistently working towards reducing commuter parking trips into the CBD especially in the AM peak. The Parking policy should ensure that parking prices both on/off street manage car commuting effectively through market rate pricing and prioritising short stay customers over long stay commuters. Reducing the supply by converting it to other uses such as active travel cycle lanes will also contribute to the Parking Levy objective and reduce supply.

The Parking Levy and the LGWM package of improvements along with the supporting parking policy will help manage supply and demand, increase parking prices especially for car commuting, reduce the amount of places available for long stay, and provide major investment in sustainable alternatives to the car which will all contribute to the objective of achieving 20% modal shift in the AM peak. The positive combination of the new policies together will need to be considered as they will directly address car commuting effectively as part of the following jigsaw solution:

- Parking Levy – increase cost of parking provision, reduce or encourage change of use and increase car commuting parking costs when passed on.
- Parking policy- manages different parking provision supply for customer groups (retail, resident, leisure, visitor, commuter etc). The Parking Policy shifts towards demand responsive pricing for on-street where high demand = high price and low demand = lower price. This is intended to maximise occupancy and create appropriate turnover rates depending on the park location. This also supports the user pays principle. The CBD metered spaces would become demand responsive and incremental, therefore, someone could stay all day, if they paid (a premium) for all day parking.
- LGWM Package of measures – Parking Levy revenue delivers a range of high-quality public transport and active travel improvements to provide increased capacity and levels of service and encourage car commuters to switch modes.

Draft Mobility Parking Guidelines and Mobility Parking Spaces (2019) - Outlines guidelines required to support the management and use of Council mobility parking spaces.

Wellington Urban Growth Plan 2014-2043 (June 2015) - this is an action-focussed plan, which builds on, updates and replaces the previous WCC urban development and transport strategies. The plan is the Council's guide for directing investment and supporting development in growth areas – a blueprint for prioritising and managing future growth. Although not specifically referencing the Parking Levy, the Urban Growth plan indicates an action to *“Discourage the provision of commuter parking particularly in the central city – short-stay parking has greater economic benefit than long-stay as it supports retail and business activity. We will encourage the conversion of long-term parking into affordable short-stay parking or other uses”*.

Te Atakura, First to Zero, Blueprint - this has several mentions of parking and user charges including:

- *“Parking pricing adjustments – One of the key services councils provides to the community is parking throughout the city. Whether for residential, coupon or short stay parking, we will explore a long-term plan for tolling higher emissions vehicles via parking charges towards the end of the transition. This may require the assistance of Central Government.*
- Sending signals about road use – To limit congestion and signal the true cost of driving there is one powerful tool to put in place – user charges. This would help optimise road use between modes, and charges would help a city with no more room to build road capacity manage demand.
- Nearly 60% of our carbon emissions come from Transport, so changing the way we move around the city is critical. We're exploring opportunities in infrastructure investment through the Let's Get Wellington Moving project as well as a range of other initiatives. Key to success is expanding shared mobility options like carshare and bikeshare, some form of user charges to reflect the true cost of driving, electric vehicle charging stations, supporting the growth of active and public transport, and more”.

Our City Tomorrow - In 2017 WCC carried out a series of stakeholder workshops, public surveys and engagement events to raise awareness of the long-term challenges Wellington is facing and start a conversation about what the city should be like in the future. From this feedback five key goals emerged-that Wellington City should be: compact, inclusive & connected, greener, resilient, and vibrant & prosperous. These goals have helped inform WCC decision-making, starting with the 10-year plan (see below).

Long Term Plan 2018-2028 (June 2018) outlined a number of priorities of which Transport is one. Within the plan there is a performance measure of <85% car park occupancy (subsequently revised to 50%-70% target in the **WCC Annual Plan 2019/20** which is based on updated current results from the WCC parking sensors) and outcome indicators of decreasing numbers of commute trips by car.

Previous New Zealand Demand Management Studies include:

Parking Restraint Measures and their Implementation – Transfund New Zealand Research Report No 145 (1999). The objective of this project was to provide guidance on the development, specification and implementation of parking restraint policies for the major urban centres in New Zealand. The report concluded that imposing a Parking Levy on publicly available CBD parking is likely to be the most cost-effective parking restraint measure. Implementing charges on private parking for private use would have the greatest impact on CBD traffic levels but would be more difficult to implement and may require enabling legislation. The report indicated the following number of spaces in Wellington CBD (based on 1996 survey):

On street:

- 4032 = metered/coupon.
- 483 = sign restricted.
- 488 = residents parking.
- 527 = uncontrolled.

Off street public (Council operated):

- 2123

Off street public (private operator):

- 9022

Off street private:

- 1525 = customers
- 12,745 = staff
- 480 = other

Therefore, in 1996 there were a total of 11,145 off street public car parks and 12,745 private (employer car parks). **Section 5** of this Report provides an update to these figures and a summary is shown in **Table 3.2** below:

Table 3.2 – Comparison of 1996 and Parking Levy derived off street CBD car park totals.

	1996	2020 (Parking Levy)
Off street Public car parks (WCC and private operators)	11,145	10,094
Off street Private car parks	12,745	11,956
Total off street private and public car parks	23,890	22,050

The report indicates that the Coupon parking scheme was implemented in December 1994 (a legal challenge delayed the start by one year) and there was total of 5,500 Coupon spaces. The charge was initially \$2 with monthly and annual discounts. The Coupon area covered the fringes of the CBD and included several resident parking zones. Assessment of the scheme in 1995 found that the number of commuter vehicles reduced by 25% and there was no displacement to adjacent non-Coupon areas. Bus ridership increased by 2%.

Wellington Region Road Pricing Study Stage 2 (February 2007) - GWRC carried out a study on road pricing in the Greater Wellington region with the primary objective of improving network efficiency and the secondary objective of raising revenue. Parking charges were ruled out of this study on the basis that parking charges were not considered to be targeted at congestion bottlenecks and have little effect on congestion (the primary objective of the road pricing study).

Wellington Public Transport Spine (PTS) Project – Alternative Funding Options Study (August 2013) - The purpose of this report was to examine the potential of alternative funding tools to fund, or part fund the PTS options. One of the options evaluated was a CBD based Parking Levy and the report concluded that a Parking Levy could be one of the options to fund the PTS options.

Tackling Congestion in Auckland – Auckland Road Pricing Evaluation Study (ARPES) March 2006. MoT studied demand management in Auckland with the focus on Road Pricing. As part of this study an option of a Parking Levy was considered. This would charge for parking on both public and private property (e.g. parking buildings or businesses) within the Auckland/Newmarket, Manukau, Henderson and Takapuna CBD's. The charges modelled were \$10 per day, in addition to any parking charges already in place. The study concluded that the Parking Levy scheme would be cheaper to implement than the road pricing schemes. The report indicated that it is a reasonably straight forward model as unlike the other schemes it would rely less on technology. It also noted that it has considerable revenue potential, but this is, in part, because the charges were set considerably higher than the charges for the other schemes. The much higher charges relative to the other schemes would be necessary to generate a meaningful impact on congestion. To achieve this impact, it would also be necessary to charge private spaces as well as street parking and public parking buildings. Therefore, legislation would be required providing parking officers access to private property. The Parking Levy scheme, while successful at raising revenue, was found to be much less successful at reducing congestion than the road pricing schemes because parking charges would not capture through traffic and the parking zones are small, focusing on CBD's as recognised concentrated areas of parking.

Further work in 2008 went into more detail on two of the options, with a Parking Levy not one of them; however, a levy was briefly discussed as a “*low-cost alternative revenue scheme*”. The study noted that “*the parking scheme would use coupons, with provision for private operators to opt out of this scheme in favour of a higher flat rate fee per space available*”. Setup costs were estimated at \$250,000, with annual costs of \$530,000. With 38,045 parks charged, the study estimated revenue of \$28.5m, i.e. \$750 per space per year. The study also looked at scaling this up by almost three times.

Recent Government announcements on Congestion Charging

Prior to the General Election in October 2020, the Prime Minister ruled out any new Regional Fuel Taxes and, during, January 2021 the Minister of Transport confirmed that the Government was only considering Congestion Charging in Auckland (where this is part of *The Congestion Question Project*).

The Sustainable Business Council and Climate Leaders Coalition

This coalition represents circa 150 businesses (including Fonterra, Silver Fern Farms, Stuff and Z Energy) representing about one-third of the country's GDP. After the General Election the Coalition compiled a list of actions its members think the Government should implement or begin this term. One of these actions was to develop a range of policies to cut road pollution including the proposed Clean Car Standard, the Clean Car Discount or “feebate” and the removal of fringe benefit tax on plug-in electric cars, to make them more attractive for corporate fleets. The group also indicated that road congestion charges, **higher parking rates** and putting \$10 million into subsidies for e-bikes would reduce the number of cars on the roads.

Relevant GWRC Modelling Reports include:

As outlined in Section 2, the Parking Levy project has reviewed and made reference to various GWRC modelling reports including:

- Wellington Transport Models - TN15 Input Parameters (December 2012).
- 2013 WTSM Update Technical Note 5 (May 2015).
- LGWM – RPI and Indicative Package Modelling Report (June 2019).
- Parking Levy Modelling note supplied by WAU (July 2020).
- LGWM Model Specification Report (August 2020).

Based on this and on discussions with the WAU a number of recommendations for improvements to the WTSM model have been made in **Section 2**.

Relevant WCC Car Park Survey Reports include:

WCC made available various car park survey reports including:

- Parking Occupation and Duration Surveys (June 2019).
- Newtown Connections Parking Survey (August 2019).
- Town Belt Parking Survey – Newtown and Island Bay (September 2019).

These surveys are useful to understand the existing on street parking situation on the CBD fringe for residential permits, coupon parking, metered 9 hour/10-hour parking, free time restricted parking (eg at Clearways) and free unrestricted parking. There is also free unrestricted parking used at Reserve Management car park locations and adjacent on street locations.

The Parking Occupation and Duration Surveys Report (June 2019) indicated the following for the weekday Coupon areas:

Average Daily Vacancy %:

- Thorndon = 19%
- Clifton Terrace = 36%
- Te Aro = 21%
- Mount Cook = 47%
- Mount Victoria = 14%
- Kelburn = 28%

Average duration of stay (mins):

- Thorndon = 341
- Clifton Terrace = 152
- Te Aro = 302
- Mount Cook = 268
- Mount Victoria = 291
- Kelburn = 342

Average turnover rate:

- Thorndon = 1.3
- Clifton Terrace = 2.0
- Te Aro = 1.3
- Mount Cook = 1.0
- Mount Victoria = 1.5
- Kelburn = 1.1

Long term parking % (defined as >4 hours):

- Thorndon = 65%

- Clifton Terrace = 23%
- Te Aro = 60%
- Mount Cook = 51%
- Mount Victoria = 54%
- Kelburn = 68%

As noted in the WCC Parking Policy, these surveys indicate that:

- Mt Victoria sampling area exceeded the 85% occupancy target on weekdays.
- Thorndon and Te Aro sampling areas were close to the 85% occupancy target for weekdays.
- There are times across the survey when there is relatively low occupancy for Clifton, Mt Cook and Kelburn.
- Average duration of stay ranged from Clifton at 152 minutes to Kelburn at 342 minutes.

Based on other data supplied by WCC it would appear that the sales of Coupon tickets in 2019 exceeded the supply of the number of Coupon parking spaces (which reflects that some of the spaces are used more than once in the day).

It can be concluded from the above that based on existing usage there is little capacity to accommodate any additional parking in the Coupon areas at Mt Victoria, Thorndon and Te Aro.

The Town Belt survey report assessed the use of inappropriate use of Reserve Management car park sites (and adjacent on street areas) by residents and commuters in Newtown and Island Bay (Rugby park at Hanson Street, Alexandra Road including Wellington Croquet Club and Wellington Harrier, zoo, Russell and Edinburgh Terrace and Wakefield Park and Berhampore golf course). The survey indicated that residents and commuters are displacing users at Hanson Street and Alexandra Road.

The Newtown Connections Report surveyed parking in the Newtown and Berhampore areas (of which 83% is unrestricted) – this report indicated a number of locations of high occupancy and long length of stay at weekdays indicating use by commuters.

Relevant Wellington/New Zealand Car Park User Questionnaires include:

Wellington City Council Parking Survey (Nov 2019)¹⁶ This was an emailed survey with 2,225 respondents from the council's "secondary online panel". It is not necessarily representative of all CBD users – for example, 65% of respondents were female, very few were under 30, and only 12% lived outside of Wellington City. Respondents tended to visit the CBD quite frequently:

- 61% visit "for shopping/ entertainment/ leisure" at least once a week
- 50% "commute... for 8 or more hours". Of those commuting to work in the CBD:
 - 35% drove or were passengers.
 - 41% took public transport.
 - 19% using active transport.

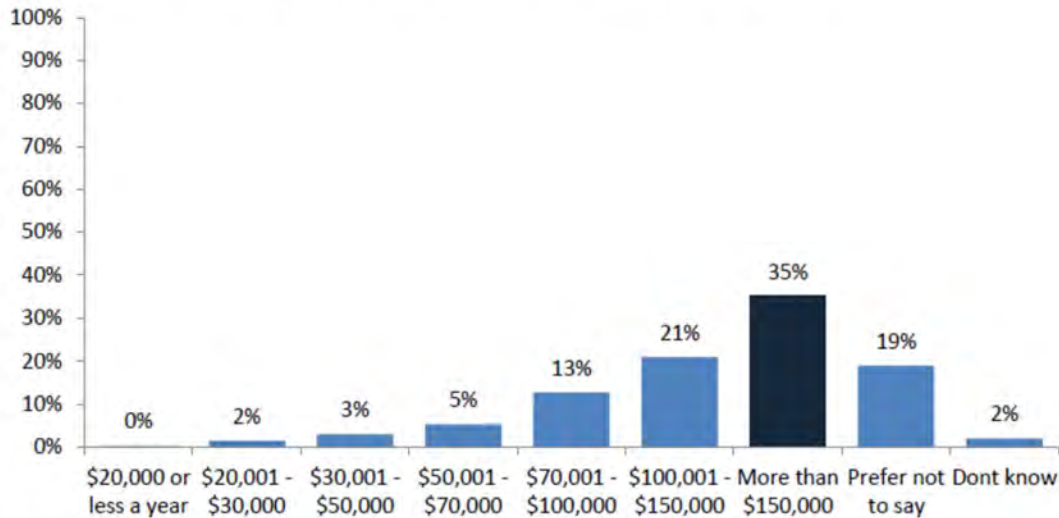
Unfortunately, the published report doesn't separate drivers from passengers, although it is likely that for commuting trips most people drove.

Key findings included that "at least half of those who drove to Wellington's central city for work... had a total household income of more than \$100,000" and "those with a high income (100k and over) are significantly more likely to drive than they are to use another mode of travel".

¹⁶ <https://www.letstalk.wellington.govt.nz/41514/widgets/235013/documents/144405>

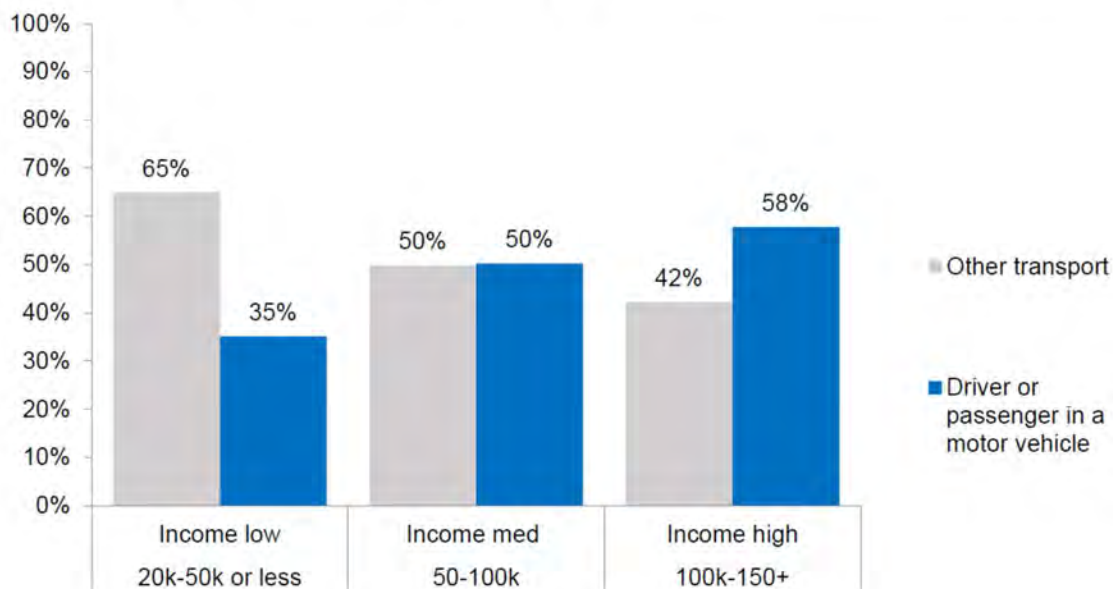
The image below shows that most of the drivers in the sample had an income of \$100,000 or more: 35% had a household income of over \$150,000 and 21% had an income of \$100,000-\$150,000, which is all the more noteworthy because 21% did not provide their income.

FIGURE 8 PERCENTAGE OF RESPONDENTS WHO DROVE OR WERE A PASSENGER IN A MOTOR VEHICLE FOR COMMUTE IN TO WELLINGTON CENTRAL CITY FOR WORK, BY TOTAL HOUSEHOLD INCOME (N=395)



Ideally, it would be better to look at the 'mode choice' of people in each income group, but these results were not broken out in detail. However, the image below does something similar for people travelling for shopping and leisure (not for commuters):

FIGURE 10 COMPARISON BETWEEN INCOME GROUPS - DID YOU DRIVE YES/NO FOR TRAVEL INTO WELLINGTON'S CENTRAL CITY FOR SHOPPING ENTERTAINMENT/LEISURE (N=1,045)



This figure shows that 65% of 'low income' households travelling to the city centre for shopping/entertainment/leisure did so by "other transport" rather than by car. 50% of 'mid income' households

travelled by other transport, and only 42% of 'high income' households did so. We expect the trends would be similar for commuters, and indeed this is suggested by 2018 census Journey To Work data.

It should be noted that revenue from a Parking Levy would help fund the LGWM package of improvements that would directly benefit the low-income groups which is a strong equity argument for a business case.

Wellington Survey by Colmar Brunton (2014) - Over June 2013 - March 2015, the Commerce Commission analysed Wilson Parking's proposed acquisition of Tournament Parking assets across a number of cities, including Wellington. The Commission focused on a few geographic areas where market share was likely to become very high, including Boulcott Street in Wellington. Ultimately, the merger was allowed to proceed. As part of their investigation, the Commission engaged Colmar Brunton to carry out surveys of CBD carpark users. We asked for the survey data as an Official Information Act request, and we received the information on 3rd August 2020, including the survey questionnaire and supporting documentation, and a spreadsheet with the results. Our comments on the results are as follows:

- Wellington interviews were carried out on weekdays in March 2014, with intercept surveys at six public carparks in the Boulcott St vicinity. This is within the CBD 'core' albeit it is towards the southern end, around 1 km from Wellington Train Station.
- The interviewers remained at the carpark from 7 am – 6 pm and attempted to do as many interviews as possible.
- 315 interviews were carried out in Wellington. There was a relatively high 65% response rate, since it was only a brief two-minute survey.
- Of the respondents, 166 were 'monthly' parkers and 124 were 'earlybird' parkers. There were only 25 casual parkers in the sample, so there could be issues in extrapolating findings from them.
- The survey results were also assigned a weighting, but we have not utilised these as they do not materially affect the results.
- The vast majority of 'monthly' parkers used the carpark each weekday, with a small number using it 4 days out of 5.
- For earlybirds, most still used the carpark each weekday, but there was a mix of fewer days. This could also reflect the earlybird parkers changing between different carparks in town.
- The vast majority of 'casual' parkers used the carpark less than once a week, with many not having used it before or not for a long time. We note again that the sample of casual parkers was quite small.
- 13 of 124 early bird parkers answered no to the question "are you paying for the parking yourself?", 82 out of 166 monthly parkers answered no to this question. We assume that in most cases it would have been the employer paying, but the simple wording may have been a source of error or confusion. For example, we would want to distinguish situations where the employee really does not pay for the park, vs where their salary package is adjusted to reflect the value of the park.
- 10 out of 25 casual parkers didn't pay for their park. We note the caveats above and that this was a very small sample.

Most importantly for the Commerce Commission, the survey asked three questions as to what the respondents would do in the following situations:

- If this particular carpark closed - 83% said they'd park elsewhere and 12% would switch to public transport.
- If this particular carpark increased prices by 5% - 58% said they'd keep parking there, 20% said they'd park elsewhere, 9% would switch to public transport, 4% didn't know.
- If all carparks increased prices by 5% - 65% said they'd keep parking there, 9% said they'd park elsewhere, 17% would switch to public transport, 1% didn't know.

The figure of 5% was chosen because this is a typical benchmark for the Commerce Commission as to whether mergers lessen competition, i.e. they do so if it would be profitable for the operator to raise prices by at least 5%.

The Commerce Commission seems to have been sceptical of these results. They thought people might either not follow through with these changes (the difference between stated vs revealed preference) or

that they might change at first, but then revert to their old patterns. It seems that this is a common response to a carpark putting up its prices. At any rate, 5% is only a small increase, equivalent to a \$20 carpark changing its price to \$21. Our review of pricing trends suggests that earlybird prices usually change in \$1 increments, so this scale of change happens quite often.

Our view is that a 5% price increase is unlikely to change behaviour this much, but it is instructive that 12% of commuters would consider switching to public transport if the carpark closed and the 'next best choice' of parking is presumably less convenient; that 9% would consider switching if the carpark raised prices by some level, be it 5% or perhaps something larger; and that 17% would consider switching if all carparks raised prices by some level. The implication for us is that at least some drivers will switch modes if parking is a bit less convenient, or more expensive.

Key relevant points to note from this survey are:

- 6) Almost all early bird parkers pay for their own park.
- 7) For monthly parkers there could be a more even split between paying for their own park vs employer pays, but the survey used ambiguous language. We addressed this issue as part of our survey.
- 8) Indicatively, around 2/3rds of commuters might pay for their own park. The share is probably lower for private carparks i.e. those in office or government buildings.
- 9) Most monthly parkers use the carpark every weekday. This is also true for earlybirds, but some might drive on fewer days or use other carparks – the survey only asked how many days they used this particular carpark.
- 10) A number of drivers would consider switching modes if parking is less convenient, or more expensive.

O'Fallon, Sullivan and Hensher (2004) - These researchers carried out 'stated preference' surveys in Auckland, Wellington and Christchurch. Their aim was to look at how drivers' behaviour would change in response to various policy tools which included higher parking charges, cordon charges, and public transport investments. The Wellington survey was carried out in 1999 and had 233 respondents from across the four city councils.¹⁷ The results were ultimately published in the Transport Policy journal in 2004, as well as in an accompanying report.¹⁸ Although the results are dated, they are still interesting given the policy tools being analysed.

Respondents were "*car drivers who drove to their workplace or their own place of study before 10 a.m. at least twice a week*". The survey seems to have been a balanced sample of car commuters, reflective of age groups, household composition etc.

Wellington respondents didn't necessarily work in the CBD, but it appears that around half of them may have: "*54% had crossed [the CBD cordon before 10 a.m.] three or more times in the previous week*". Some of these drivers may have been on their way to a workplace outside the CBD.

Relevant statistics for the Wellington sample are:

- 16% drove their child to school and 10% made another 'pre-work trip' before travelling to work.
- 42% personally paid some money for parking in the last week.
- 47% parked in a space "provided by [their] employer or place of study".
- Around half of the Wellington drivers used their car for some company business "to deliver things or visit customers, for example", with 19% using their car on 1-2 days a week and 32% using it for 3+ days.
- "Women were much more likely to make one or two stops on the way to their work or study than were men – 29% of women made one or two trips before work compared with 19% of men. The

¹⁷ Wellington City, Lower Hutt City, Upper Hutt City, Porirua City

¹⁸<https://web.archive.org/web/20071013020919/http://www.pinnacleresearch.co.nz:80/research/commuters/report%20section3.pdf>

majority of trips before work were related to parental responsibilities: of the 208 stops made on the way to work by our sample population, 122 (59%) were to drop children off, either to caregivers or to school”.

Statistics from table 7 of the report show that 3.5% of Wellington drivers would change mode in response to a \$5/ day carpark surcharge, or 7.5% of drivers in response to a \$10/ day surcharge. It appears that this charge was only applied where people were already paying for parking, which was only the case for 42% of respondents. Scaling up accordingly, it implies that 8% of drivers who pay for parking would switch mode if there was a \$5 surcharge, and 18% would switch mode if there was a \$10 charge.

Statistics from table 7 of the report show that found that 7.9% of Wellington drivers would shift to another mode in response to a \$5/ day cordon charge, or 11.0% of drivers in response to a \$10/ day cordon charge. Given that only 67% of respondents had entered the cordon at least once in the previous week, it implies that 12% of drivers entering the cordon would switch mode if there was a \$5 charge, and 16% would switch mode if there was a \$10 charge.

Nationwide, “nearly one-half (48%) of the sample always chose to continue to drive their car (Drive) in response to the scenarios presented them. The respondents were very evenly distributed among the three cities... [and] were more likely to be male, self-employed (students were more likely to switch modes), drive a company or business vehicle and to use their car during working hours for business-related trips”.

Key relevant points to note from this research mainly relate to the impact of the parking surcharge or cordon charge. A charge of \$5 would get 8%-12% of drivers to change mode, whereas a charge of \$10 would get 16%-18% to change mode. These results are indicative but illustrate that a reasonably large charge is needed to change behaviour: \$10 was a larger amount of money in 1999. The Consumer Price Index has increased by 54% since then, and median household incomes have doubled.

Appendix 4.1

Economic Literature Review and Overseas Data Analysis

Commerce Commission Studies

The Commerce Commission has carried out a number of studies on parking markets over the years. Its role has been to assess proposed mergers (e.g. buying the assets of a competitor) and decide whether they can proceed. Approval can only be granted if the Commission is satisfied that a “substantial lessening of competition” is likely.

Studies that have looked at Wellington parking include two undertaken in 1997, a further two in 2013-2015, and one in 2018-20.

One Commerce Commission investigation over June 2013 - March 2015 analysed Wilson Parking’s proposed acquisition of Tournament Parking assets across a number of cities including Wellington. The Commission focused on a few geographic areas where market share was likely to become very high, including Boulcott Street in Wellington. As part of its investigation, the Commission engaged Colmar Brunton to do a survey on Wellington parkers, which we discuss below. Ultimately, the acquisition was approved.

A second investigation in 2015 looked at further acquisitions by Wilson of Tournament assets. This included four carparks in Wellington (and one in Auckland), and the merger was approved in November 2015. The Wellington carparks were Leftbank, Lombard, Marion Street and Plimmer Tower with 203, 314, 205 and 602 bays respectively. The lease on Plimmer Tower was for 4 years whereas the others were all for 5+ years.

Most recently, the Commerce Commission filed High Court proceedings in July 2018, following Wilson Parking’s acquisition of the Capital Carpark lease at 50-60 Boulcott St.¹⁹ Wilson had not sought clearance for the merger. A settlement was agreed in October 2020, with Wilson agreeing to divest the leases for three carparks totalling 850 spaces and required to “notify the Commission of any proposed acquisitions of new car parks in Wellington central for the next five years”.²⁰

As noted above, the Commerce Commission engaged Colmar Brunton to carry out surveys of CBD carpark users as part of a 2013-15 investigation. We received the survey data via an Official Information Act request. Our comments on the results are as follows:

- Intercept surveys were carried out at six public carparks in the Boulcott St vicinity on weekdays in March 2014.
- 315 interviews were carried out with a 65% response rate.
- Of the respondents, 166 were ‘monthly’ parkers and 124 were ‘earlybird’ parkers. There were only 25 casual parkers in the sample, so there could be issues in extrapolating findings from them. These proportions may not reflect all Wellington public carparks.

The survey asked three questions as to what the respondents would do in the following situations:

- If this particular carpark closed: 83% said they’d park elsewhere and 12% would switch to public transport.

¹⁹ <https://comcom.govt.nz/news-and-media/media-releases/2018/proceedings-filed-against-wilson-parking-over-acquisition-of-wellington-car-park>

²⁰ <https://comcom.govt.nz/news-and-media/media-releases/2020/wilson-parking-agrees-to-divest-car-parks-in-settlement-agreement-with-commerce-commission>

- If this particular carpark increased prices by 5% (for earlybird/ casual parkers only, a prompt was given as to what this increase would be in dollar terms): 58% said they'd keep parking there, 20% said they'd park elsewhere, 9% would switch to public transport, 4% didn't know.
- If all carparks increased prices by 5% (with no further prompts in dollar terms): 65% said they'd keep parking there, 9% said they'd park elsewhere, 17% would switch to public transport, 1% didn't know.

The figure of 5% was chosen because this is a typical benchmark for the Commerce Commission as to whether mergers lessen competition, i.e. they do so if it would be profitable for the operator to raise prices by at least 5%.

The Commerce Commission seems to have been sceptical of these results. They thought people might either not follow through with these changes (the difference between stated vs revealed preference) or that they might change at first, but then revert to their old patterns. It seems that this is a common response to a carpark putting up its prices. At any rate, 5% is only a small increase: equivalent to a \$20 carpark changing its price to \$21. Our review of pricing trends suggests that earlybird prices usually change in \$1 increments, so this scale of change happens quite often.

Our view is that a 5% price increase is unlikely to change behaviour this much, but it is instructive that 12% of commuters would consider switching to public transport if the carpark closed and the 'next best choice' of parking is presumably less convenient; that 9% would consider switching if the carpark raised prices by some level, be it 5% or perhaps something larger; and that 17% would consider switching if all carparks raised prices by some level. The implication for us is that at least some drivers will switch modes if parking is a bit less convenient, or more expensive.

Other Parking Surveys

O'Fallon, Sullivan and Hensher (2004) carried out 'stated preference' surveys in Auckland, Wellington and Christchurch. Their aim was to look at how drivers' behavior would change in response to various policy tools which included higher parking charges, cordon charges, and public transport investments.

The Wellington survey was carried out in 1999 and had 233 respondents from across Wellington, the Hutt and Porirua. Although the results are dated, they are still interesting given the policy tools being analysed.

Respondents were "car drivers who drove to their workplace or their own place of study before 10 a.m. at least twice a week". The survey seems to have been a balanced sample of car commuters, reflective of age groups, household composition etc. It appears that around half of them worked in the CBD, with the rest working elsewhere in the Wellington region.

The wording in O'Fallon, Sullivan and Hensher (2004) is slightly ambiguous, but our interpretation of their tables is that, of those drivers who pay for parking or who work in the CBD, a charge of \$5 would get 8%-12% of drivers to change mode, whereas a charge of \$10 would get 16%-18% to change mode. These results are indicative but illustrate that a reasonably large charge is needed to change behaviour: \$10 was a larger amount of money in 1999. The Consumer Price Index has increased by 54% since then, and median household incomes have doubled.

Pandhe and March (2012) investigated the importance of convenient parking on Melbourne CBD commuters' mode choice, using a sample of 72 car users and 91 public transport users. They found that the most common reason for driving was that it "saves time" compared with other modes, with some noting the "availability of [a] parking space" or "lower parking fees via subsidisation".

For public transport users, 9% stated that they would shift to driving "if convenient access to a parking space becomes available, irrespective of cost" (Pandhe and March 2012). The notion of 'latent demand' or Jevon's paradox is important to bear in mind here.

Fringe Benefit Tax

Like many countries, New Zealand grants a Fringe Benefit Tax exemption for employer-provided parking. A small number of countries, notably Australia where three of the existing parking levy schemes operate, don't have such an exemption.

Dutzik et al (2017) summarise the contradictions in the FBT exemption as follows:

"Imagine the creation of a new government program in which federal authorities send you a check at the end of the year to reward you for driving to work alone.

But there are a few catches. First, you only get the check if you work in a city—and you get a bigger check if you work downtown. Second, the size of your check depends on how much money you make. If you are a stockbroker or CEO, your check might be twice as big as that of the receptionist or salesperson working down the hall...

Surprisingly, such a program actually exists: the federal tax benefit for commuter parking".

The exemption is largest for people in higher income brackets (since they would otherwise pay a higher rate of tax) and those who work in places where parking is expensive (i.e. the CBD). As such, the exemption is regressive and it is most distortionary in city centres, where the negative externalities of parking and driving are highest. This is a source of inequity and it is certainly present in the Wellington CBD.

Van Ommeren and Wentink (2012) carried out a Dutch study which found that "the policy not to tax parking as a fringe benefit increases the number of [employer-provided] parking spaces by about one third... [and] the annual deadweight loss is about €77 per parking place. So, on average, 10.2% of current parking expenses are a deadweight loss (in terms of the optimal number of parking spaces, the deadweight loss is of course much higher and is about 16%)".

The perverse effects of the FBT exemption could be reduced somewhat by extending the exemption to public and active modes, but this is only a partial solution: parking can cost more than \$20 a day whereas other modes tend to be much cheaper, so drivers still benefit the most. A fixed-amount travel allowance/ 'cash out' (e.g. \$20 a day regardless of mode) would be a better candidate for exemption, although still regressive in tax terms.

Literature Review and Data Analysis for Overseas Parking Levies

We have carried out a wide-ranging literature review of the overseas parking levy schemes, including academic publications as well as internal/ government reviews. We have also sourced updated data and carried out our own analysis within the parking levy consultancy team.

To our knowledge, no economic studies have made a detailed comparison of the overseas schemes against each other. Some schemes have had more attention than others: we have found three relevant studies for Perth, three for Sydney, and at least 6-7 for Melbourne. Nottingham is the most studied scheme despite being the newest, with at least ten papers of which we have focused on three recent ones, published in 2017-19.

We are especially interested in testing outcomes, and understanding the incentives faced by different groups (parkers, carpark owners and operators etc). A key aim of any parking levy in Wellington is to encourage mode shift in peak periods; for this to occur, the levy charge needs to be passed through to consumers as much as possible. Designing a levy scheme so that vacant spaces are not charged (which encourages higher prices rather than higher occupancy), and commuters are targeted rather than casual parkers, would help achieve this aim.

The different schemes overseas lead to quite different incentives. They all recognise that empty spaces are not contributing to congestion, and have provisions to avoid charging them:

Melbourne’s scheme originally focused on peak congestion, so public parking spaces were given an exemption for the day if they were not filled by a parker arriving before 9:30 am and staying for 4+ hours. This targeted commuter parks rather than casual parks. This exemption was removed in 2014.

Sydney’s scheme is also concerned with interpeak travel, so spaces are only exempt if they are vacant at 1 pm (the busiest time of the day, when casual demand adds to commuter demand).

Perth requires that the space be ‘decommissioned’, e.g. roped off or otherwise unavailable.

Nottingham’s scheme applies to employer-provided parking only, but the levy cost is calculated based on the maximum occupancy of the carparks, e.g. if the carparks are never more than 90% full then only 90% of spaces are charged.

Private parking spaces which are vacant long-term (e.g. parking spaces in office buildings that aren’t leased or used) would be able to avoid the levy charge in any of the four cities. Public parking spaces may be able to avoid the levy if not occupied on a given day/ time, depending on the city.

Price Trends, ‘Pass Through’ and Incidence of Levy Burden

From an economic perspective, we summarise the four overseas levy schemes as follows:

- Sydney: the Parking Space Levy was implemented in 1996 at \$200, rising to \$800 by 2000. Also, in 2000, a “Category 2 area” was added to cover smaller CBDs such as Chatswood and Parramatta. A major price increase took place in 2009, and since then increases have continued in line with inflation.
- Perth: the Parking Levy was introduced in 1999 at \$70, rising to \$180 by 2003. A major price increase took place in 2009, with another major increase staggered over 2013-2015. The levy has covered the same geographic area throughout, just the CBD. It charges slightly lower rates for “short stay public” parking than it does for “long stay public” or “tenant” parking.
- Melbourne: the Congestion Levy was implemented in 2006 at \$400, rising to \$800 in 2007. A major price increase took place in 2013 to \$1,300. The levy initially only covered ‘long stay’ parks, but other parks were brought into the scheme in 2014. In 2015, a “Category 2” area was added to cover the CBD fringe at \$950.
- Nottingham: the Workplace Parking Levy was implemented in 2012 at £238, reaching £362 two years later and increasing with inflation since then. It covers the entire City of Nottingham.

There have only been a few studies which looked at whether levy charges were ‘passed through’ and their incidence i.e. which groups are affected. These studies are mostly quite dated, and some give inconsistent results. As such, we generally prefer to focus on our own analysis of price changes within the last decade.

One previous study was Hamer et al (2012), which argued that only a small share of the Melbourne levy cost was passed on to commuters. However, their results were based on three separate datasets which may not be fully aligned and covered the early years of the levy (2005-2009). They concluded that earlybird price increases over 2005-2008 “covered only 40%-60% of the total cost of the levy” (Hamer et al, 2012).

Hamer et al (2012) also interviewed property managers who commented that “for the most part, their clients (i.e. car park owners) passed the levy on entirely to tenants” but sometimes waived other rent increases as a result. This means “that while the tenant appeared to be paying the levy, the owner was actually subsidising the tenant for part of this payment by not increasing the rental payments due under

the base lease”. This is consistent with what we would expect from economic theory, i.e. the burden of the levy is actually shared between the owner and the tenant even if the bill is paid by the tenant.

Although Hamer et al (2012) provides food for thought, we think their results are largely superseded by other studies, including a Department of Treasury and Finance (2010) paper which they do not appear to have had access too, and our own analysis.

Department of Treasury and Finance (2010) concluded that Melbourne public “parking operators are passing a significant proportion of the Levy to car park users through higher prices”, based on consistent data for the same carparks over 2005-2009. Our interpretation of that data, though, shows that around 50% of the levy cost was passed on in those early years.

Figures 4.3, 4.4 and 4.5 show how ‘early bird’ prices have changed over time in the three Australian cities, together with how the parking levy costs have changed. We note the following:

- In 2009, Sydney’s parking levy increased from an equivalent \$3.80 a day to \$8.00 a day. Almost none of this increase was passed on, with earlybird prices increasing by just 80 cents over 2008-2010 or less than 20% of the levy increase. This implies that carpark owners absorbed most of the cost themselves, perhaps due to flat economic conditions. It is possible that prices might have fallen if not for the levy increase, but of course we can’t observe this. As we discuss below, there also seems to have been a strong quantity response: the number of private unlet carparks rose substantially in the following years.
- Looking at Sydney in the following years, it was not until 2014-15 that prices rose sufficiently to recoup the 2009 increase. Of course, inflation and other costs would have also risen during this time, meaning that parking profits were certainly eroded and over a long time period.
- In 2014, Melbourne’s parking levy increased from an equivalent \$3.72 a day to \$5.20 a day. This was evident in increased prices by 2015, with earlybird prices increasing by \$1.43 over 2013-2015 or almost 100% of the levy increase.
- In 2009, Perth’s parking levy increased from an equivalent \$0.85 a day to \$2.34 a day. The increase seems to have been fully passed on, with prices rising by \$2.74 – more than the levy increase.
- Over 2012-15, Perth’s parking levy increased from an equivalent \$2.53 a day to \$4.25 a day. The increase seems to have been fully passed on, with prices rising by \$2.94 – more than the levy increase.
- The parking levies now account for 27%-40% of the total parking price in the three Australian CBD areas.

Figure 4.3: Sydney Early Bird Parking/ Levy Costs (Cat. 1)

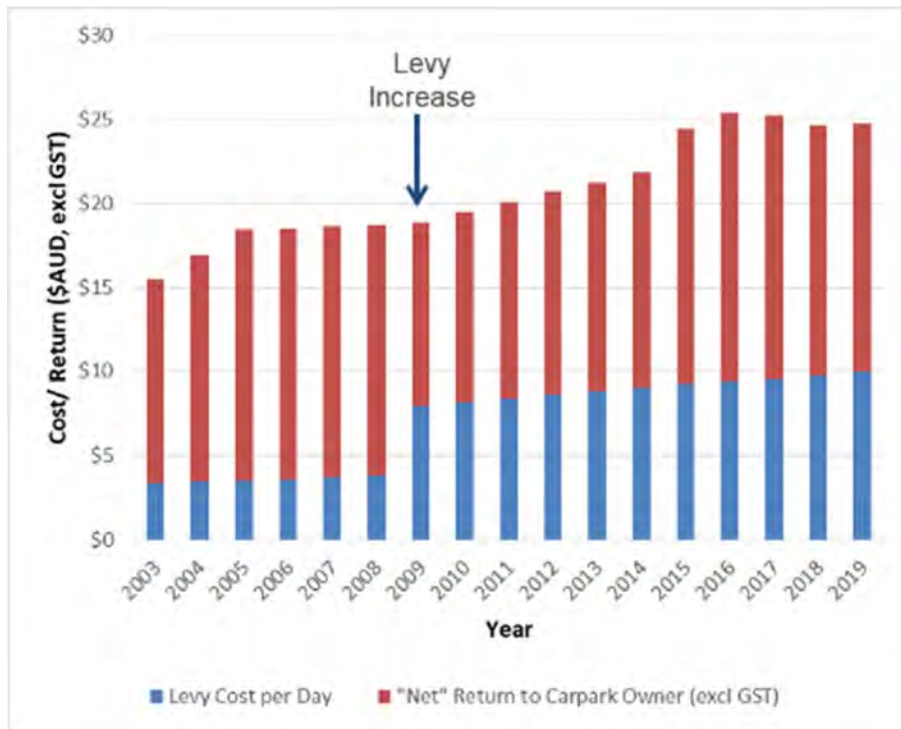


Figure 4.4: Melbourne Early Bird Parking/ Levy Costs (Cat. 1)

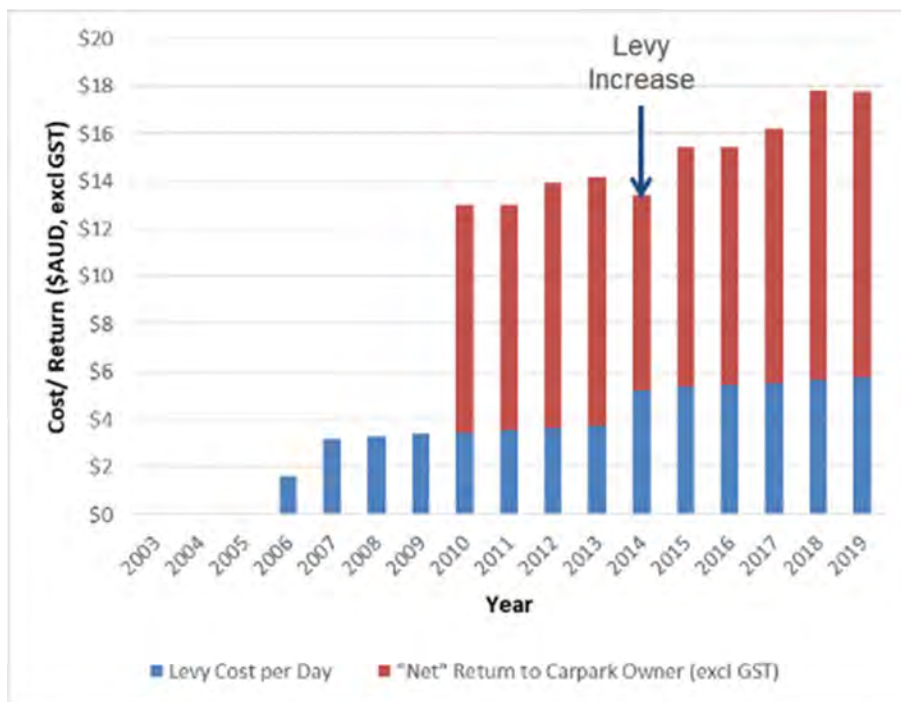
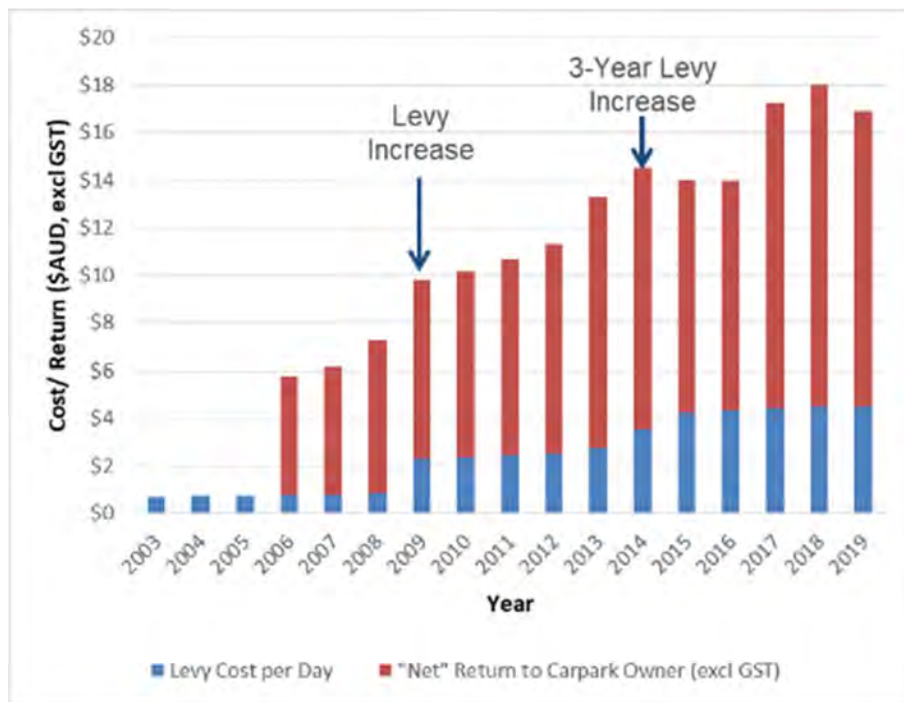


Figure 4.5: Perth Early Bird Parking/ Levy Costs



With the exception of the Sydney 2009 increase, our analysis suggests that, when a major levy increase occurs, a significant proportion of the increase is 'passed on' resulting in higher parking prices for public carparks. This suggests that the elasticities of supply and demand are similar to each other. Supply may be a little more elastic than demand if the pass-through is greater than 50%.

It is unclear whether the supply of private carparks is more or less elastic than the supply of public carparks. As outlined below, it appears that Sydney building users have significantly reduced the quantity of spaces they lease over the last decade. This implies a reasonable degree of elasticity.

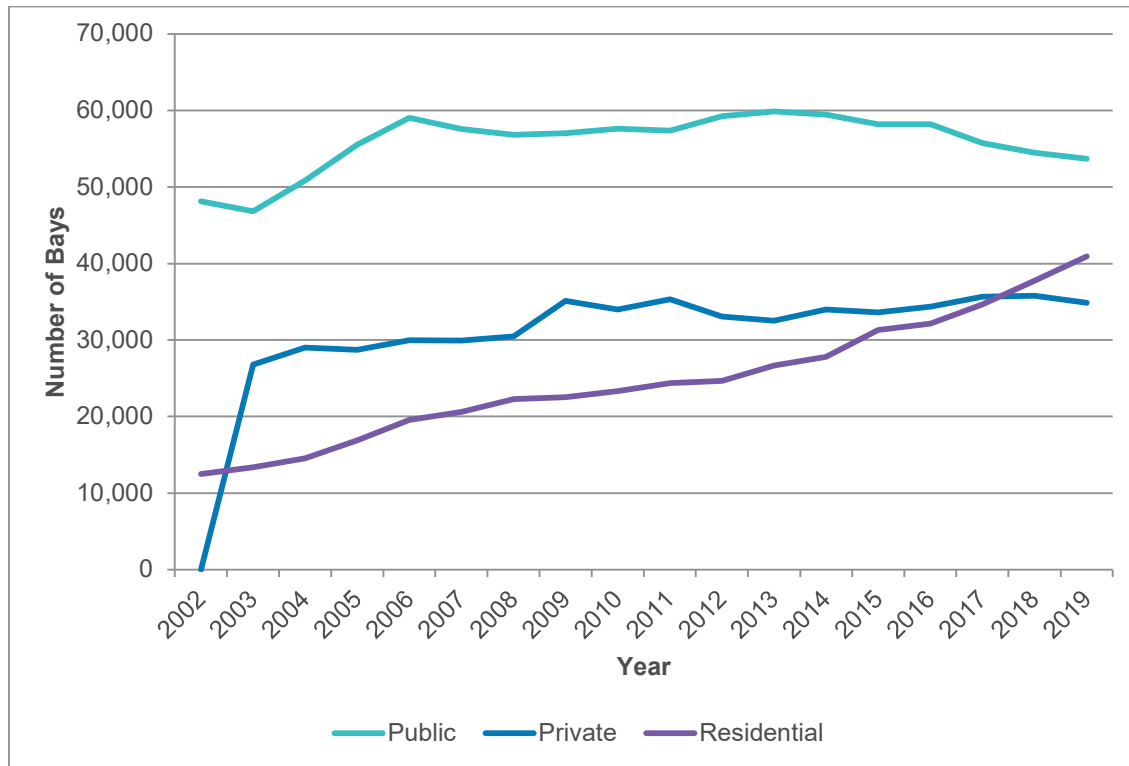
Effects on Parking Supply (and Parking Used by Commuters)

We have sourced time series data on parking supply for each of the four overseas cities, although the data may not be comparable between cities.

For Melbourne, we use Census of Land Use and Employment (CLUE) data.²¹ The trends over 2002-2019 are shown below, noting that CLUE is a biennial/ rolling study that takes two years to update all areas:

²¹ Data based on the following CLUE small areas: Docklands, East Melbourne, Melbourne (CBD), Melbourne (Remainder), South Yarra, Southbank. These are almost identical to the Category 1 levy area. Note that CLUE uses the terminology "commercial" rather than "public" parks, which we have renamed for consistency with the rest of our report.

Figure 4.6: Melbourne Parking Supply in the 'Category 1' Area



Source: Melbourne Census of Land Use and Employment

The CLUE data suggests that the number of public and private carparks hit an initial peak of 89,000 in 2006, the year the levy was introduced, before dipping slightly and then recovering to a plateau of 92,000 parks. There is growing evidence that the number of carparks has been trending down since the latest big levy increase in 2014, especially public parking which would find it hard to avoid the levy. The number of carparks is now back to 2006 levels with 89,000 parks in 2019. We also have indirect evidence that the number of leased private carparks has fallen too, i.e. effective supply has fallen more than the CLUE data suggests.²²

By comparison, employment has grown by 37% over 2006-2019, from 283,000 to 404,000 people. Residential parking (which does not pay the levy) has grown strongly throughout the 2002-2019 period, along with the residential population.

Department of Treasury and Finance (2010) found that during the 2005-2009 period when short-stay spaces did not have to pay the levy, “the number of long-stay parking spaces in the Levy area has fallen slightly, while there has been a significant increase in the number of short-stay spaces. This fall in long-stay spaces occurred despite strong growth in CBD office floor space and CBD employment”.

²² Tax expenditures (revenue foregone) for commercial/ private carparks have risen from \$35 million in 2014/15 to \$53 million in 2018/19. At the 'category 1' levy rate this suggests around 10,000 fewer parks being leased. The levy charge had actually taken effect at the start of 2014, so there may well have been a reduction in leased parks in 2014 as well but we do not have the data to establish this.

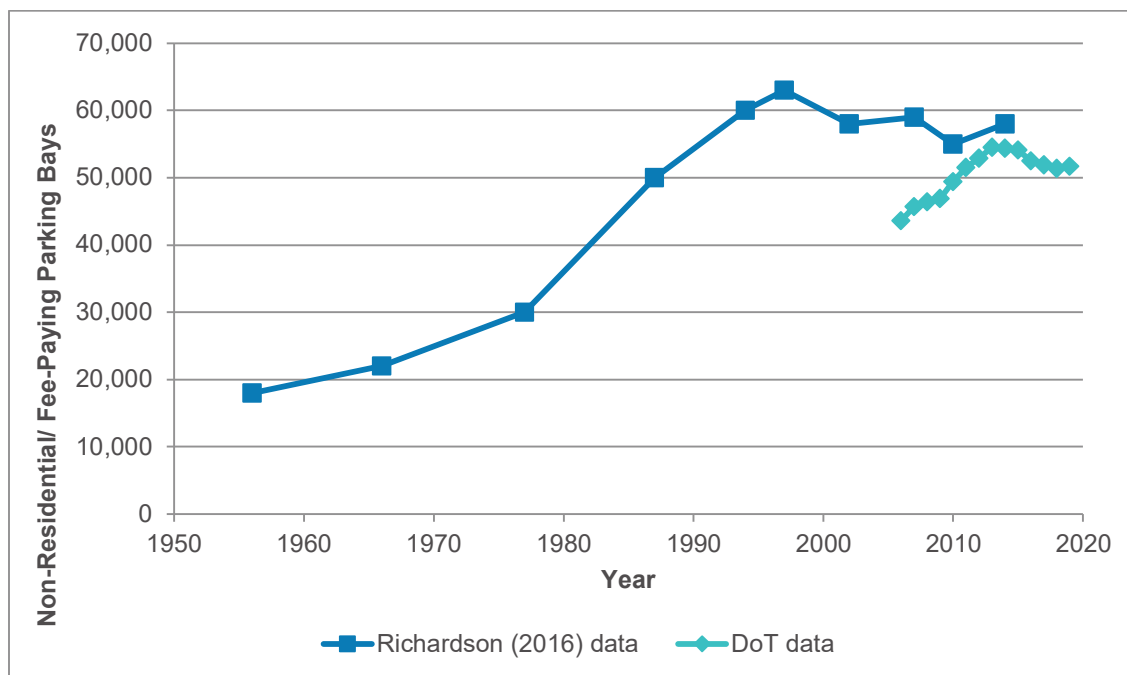
Infrastructure Victoria (2018) “[concluded] that the levy has been successful in reducing the supply of leviabale spaces within the levy areas and is achieving its objective of reducing traffic congestion in central Melbourne”.

Infrastructure Victoria (2018) noted that: “Between 2015 and 2017, there has been a 2% reduction in the number of leviabale car parking spaces in category 1 zones, and a 9% reduction of spaces in category 2 zones. This is estimated to be around 3,900 vehicles off the road in the morning peak period in 2017 compared to 2015. By way of comparison, two lanes of freeway would need to be built to accommodate an additional 3,900 peak period vehicles on the road network. The recent widening of CityLink effectively added an extra lane in each direction, with an estimated cost of nearly \$1.3 billion”.

“This reduction in supply [over 2015-17] has occurred during a period of growth in the number of jobs in the City of Melbourne, which would typically result in an increasing demand for commercial and private off-street car parking spaces” (Infrastructure Victoria, 2018).

For Perth, we have constructed a composite graph of parking supply, based on the graph in Richardson (2016) covering 1956-2014, and data we were provided directly by the WA Department of Transport covering 2006-2019:

Figure 4.7: Perth Parking Supply in the Levy Area



Sources: Richardson (2016), WA Department of Transport

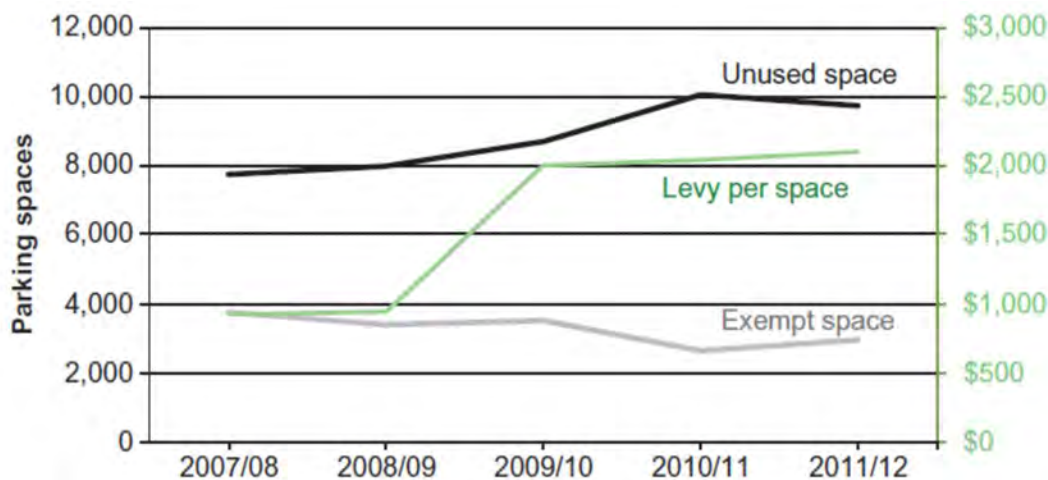
The Richardson (2016) data shows parking supply rising through the decades from the 1950s and peaking around 1997 prior to the levy’s introduction. It shows a fall post-levy, and then roughly steady supply through to 2014/15. The more recent data from WA Department of Transport shows a rise in parking supply over 2006-2013 – unlike the Richardson (2016) data – but then shows a fall since the most recent levy

increases. Although the two data sources do not quite line up, or show consistent trends, they both suggest that the levy has an effect on parking supply.

Perth employment grew strongly up until 2011, with more modest growth over 2011-2016.

We received detailed Sydney parking data for 2010-2019 from the levying authority, Revenue NSW. We also reproduce the findings of Ison et al (2014) below, which used data for 2008-2012. This period covered the largest levy increase, from \$950 in 2008/9 to \$2,000 in 2009/10.

Figure 4.8: Sydney Exempt and Unused Spaces in the Category 1 Area, 2008-2012



Source: Ison et al (2014)

In Sydney, “exempt spaces” are those which are used for exempt purposes e.g. residential, bike, disabled parking or loading zones. All other spaces are liable to pay the levy but may receive concessions for days/ periods that they are not being used. “Unused spaces” are those which are in a public carpark and unoccupied at 1 pm on a given day, or in a private carpark and not currently leased. The concessions for unused spaces are calculated on a daily basis, and we follow Ison et al (2014) in converting them to an annual equivalent number of spaces. For example, the total value of concessions was \$25.8 million in 2009/10 based on the data we received from Revenue NSW, equivalent to 11,215 spaces (at \$2,000/year).

As illustrated in the graph above, Ison et al (2014) found that the number of unused spaces rose significantly from 2009/10 onwards at the same time the levy rose. This suggests either that the new levy rate had an impact on reducing the demand for parking or that parking operators found the new rate provided a higher incentive to better monitor and declare spaces as unused” (Ison et al, 2014).

We present more recent data from Revenue NSW in the table below:

Figure 4.9: Sydney Liable and Equivalent Levied Spaces in the Category 1 Area, 2010-2019

Financial Year	Total Spaces (A + B)	Exempt Spaces (A)	Liable Spaces (B)	Casual Concessions	Unlet Concessions	Equivalent Unused Spaces (C)	Equivalent Levied Spaces (B - C)
2010	56,087	4,535	51,552	\$12,675,452	\$9,754,607	11,215	40,337
2011	56,088	3,800	52,288	\$13,287,418	\$14,307,369	13,527	38,761
2012	56,344	4,378	51,966	\$12,278,240	\$15,100,549	13,038	38,928
2013	57,284	4,325	52,959	\$16,382,514	\$17,069,852	15,487	37,472
2014	58,566	4,365	54,201	\$17,157,118	\$17,518,016	15,690	38,511
2015	59,036	4,388	54,648	\$17,752,774	\$18,595,891	15,735	38,913
2016	57,535	4,257	53,278	\$14,691,340	\$22,096,008	15,654	37,624
2017	58,171	4,842	53,329	\$15,652,590	\$21,640,214	15,604	37,725
2018	58,255	4,953	53,302	\$11,670,554	\$28,441,905	16,440	36,862
2019	58,529	4,969	53,560	\$11,796,378	\$28,657,099	16,246	37,314

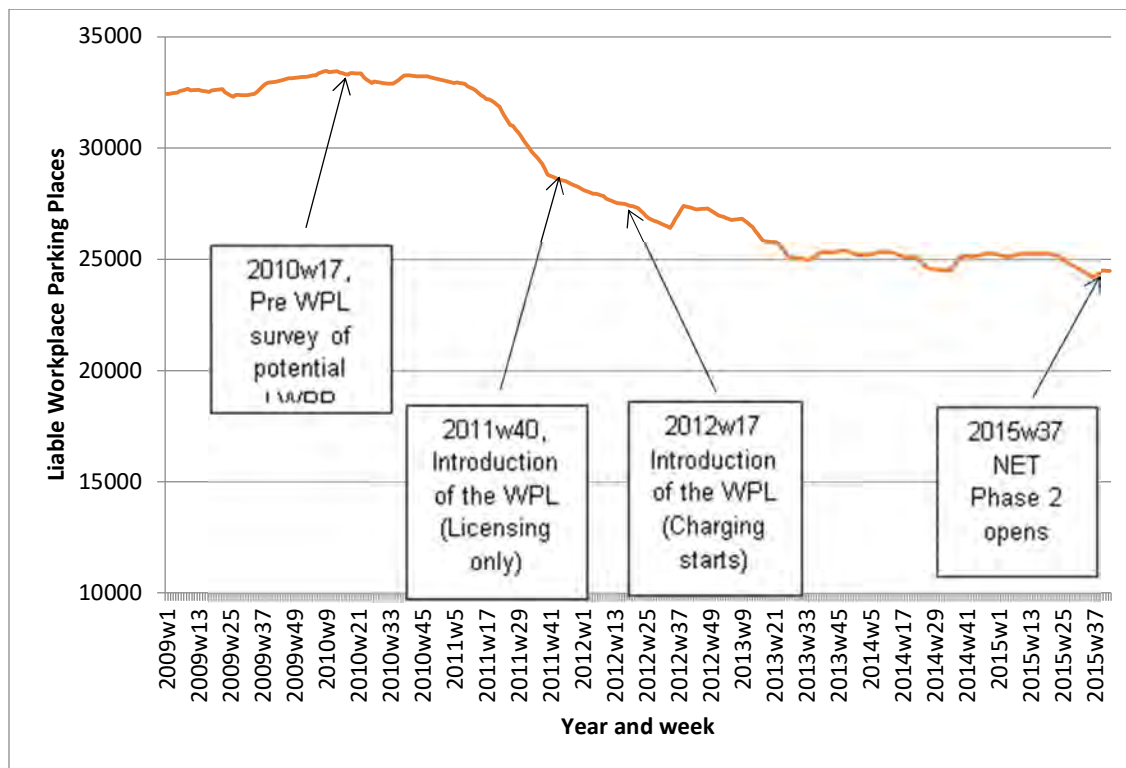
Source: Revenue NSW

This table shows that, while the total number of spaces (and the liable number of spaces) in the Category 1 area has grown over 2010-2019, the effective number of liable spaces has fallen – i.e. a larger proportion of concessions are being claimed.

The figures for “unlet concessions” are especially relevant for our study. They have almost tripled since 2010 in dollar terms and suggest that the number of unlet private parks has grown from 4,877 in the first year following the price increase, to 11,509 in 2019. This suggests that, as office tenants renegotiated their leases in the years following the levy increase, they leased fewer and fewer spaces. This is a significant behaviour shift – the equivalent of 6,632 spaces or more than 10% of the Sydney total over a decade.

Nottingham is quite different to the Australian schemes and has less in common with the Wellington CBD context. Prior to the levy’s introduction, parking was often unpriced and it is likely that there was a lot of ‘excess’ (or, at least, low value) parking supply. As such, the number of liable spaces decreased by 17.5% before the levy took effect, as employers sought to limit their liability or introduced parking management schemes that passed the cost on to their employees. After introduction, there has been a much more gradual reduction. The number of spaces has stabilised at around 75% of its pre-levy level – 25,000 spaces in 2015 as shown in the graph below, with fluctuations around this number since then (26,000 in 2020).

Figure 4.10: Nottingham Liable Spaces, 2009-2015



Source: Nottingham City Council

This is a more substantial response than we would expect for a well-developed CBD like Wellington, where parking is already priced.

Effects on Travel Patterns

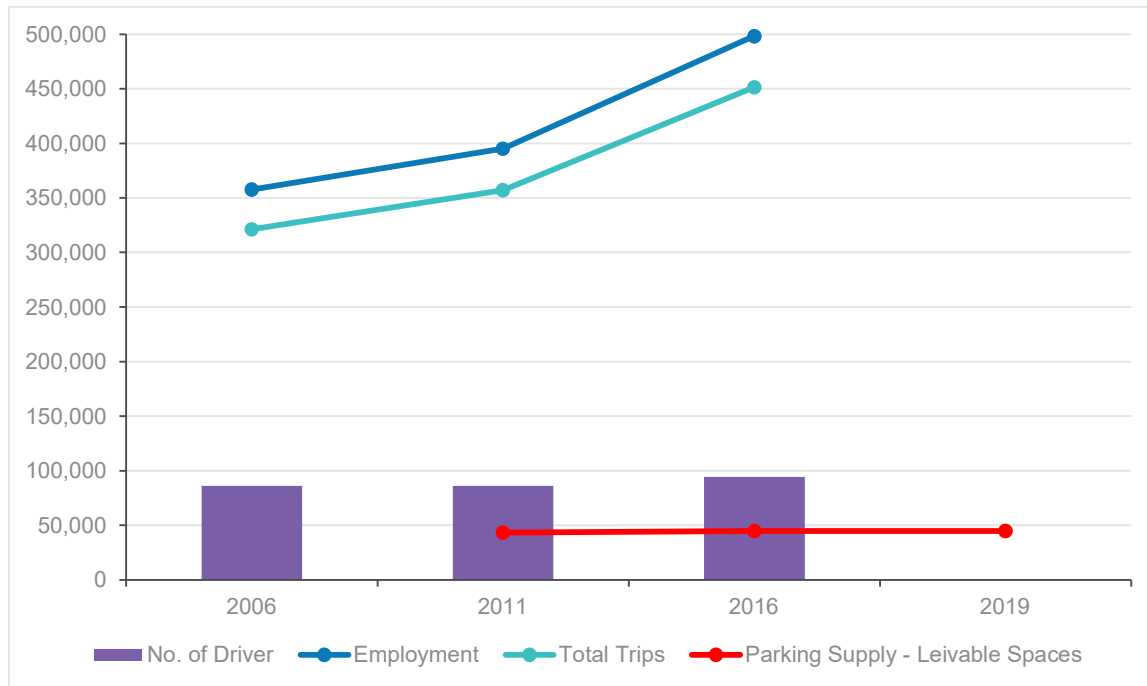
Pricing is just part of the equation and for Wellington we are more interested in understanding what happens to the number of car drivers. We can measure this directly through census ‘journey to work’ questions, cordon surveys etc. The overseas levy schemes haven’t always managed to reduce the number of drivers, but then this is not necessarily their goal: they are aiming to manage or reduce congestion, or to raise revenue for non-car modes. We note that in all cities, the number of drivers has been flat or increased very slightly whereas the total number of employees has increased much more. As such, there has been significant mode shift in percentage terms, even if not in numerical terms.

The Department of Treasury and Finance (2010) found that the Melbourne levy reduced average weekday traffic volumes in the levy area by around 6% over 2005-2009, despite significant employment growth over that period. Similarly, Infrastructure Victoria (2018) found that the Melbourne levy is “correlated with a reduction in private vehicle mode share for trips in the CBD”.

Richardson (2016) notes that “the Perth Parking Policy introduced in 1999 has complemented public transport and cycling access improvements to central Perth. The combined impact has been a reduced level of driving into Perth from that which existed in the mid-1990s, despite an increase in employment of 40 per cent since that time. Car driving mode share to central Perth reduced from 50 per cent to 35 per cent between the mid-1990s and 2015”.

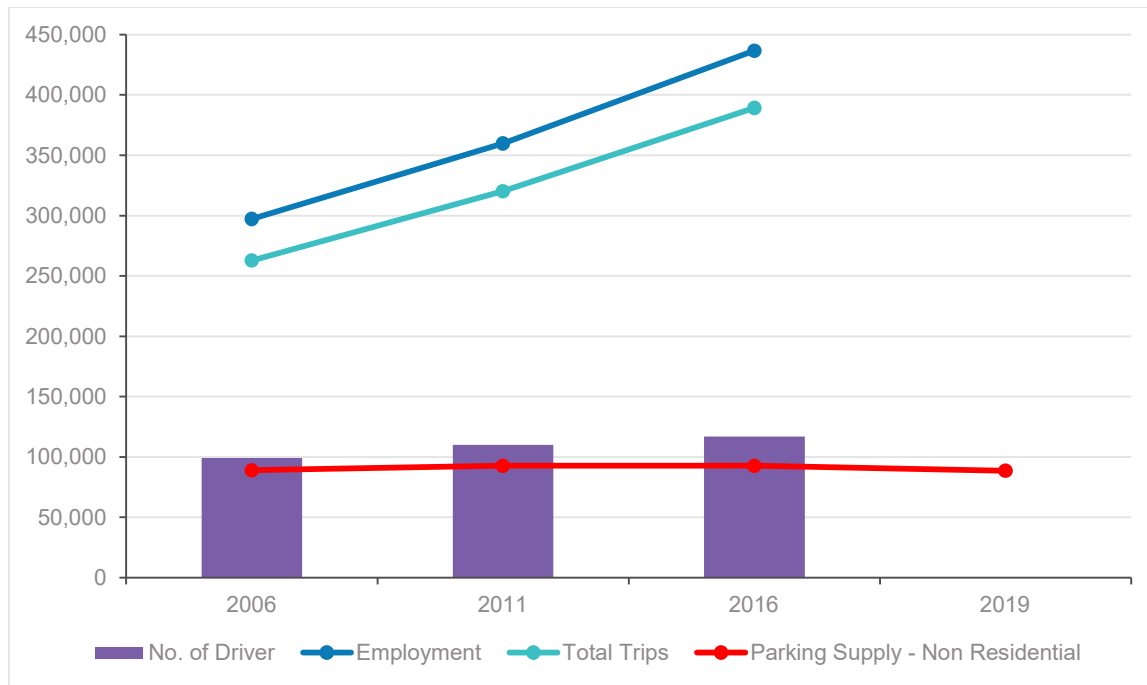
The number of car commuters and total commuters in the three Australian cities is shown in **Figures 4.10, 4.11 and 4.12** below, for the 2006, 2011 and 2016 censuses. We also show parking supply data from various sources. Note that the city council boundaries may not correspond exactly to the levy boundaries:

Figure 4.10: Sydney Employment, Total Commutes and Car Commutes



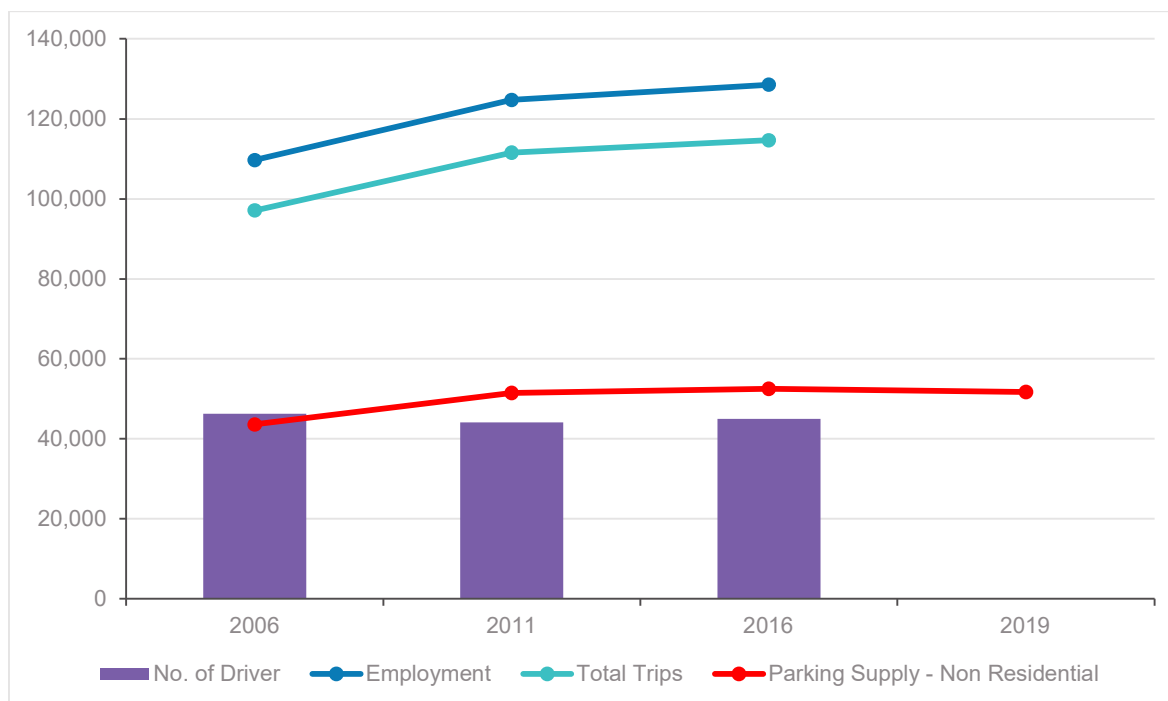
Note: parking supply is based on Office of State Revenue data for non-exempt spaces

Figure 4.11: Melbourne Employment, Total Commutes, Car Commutes and Parking Supply



Note: parking supply is based on Census of Land Use and Employment data

Figure 4.12: Perth Employment, Total Commutes, Car Commutes and Parking Supply



Note: parking supply is based on Department of Transport data for fee-paying parks only. It includes 'casual' parks as well as 'commuter' ones.

As a summary of **Figures 4.10, 4.11 and 4.12** above:

- The number of 'journeys to work' in Sydney have risen from 321,000 to 452,000 over 2006-2016. The number of driving trips has risen from 86,000 to 94,000, an increase of 8,000 or just 6% of total trip growth.
- The number of 'journeys to work' in Melbourne have risen from 263,000 to 389,000 over 2006-2016. The number of driving trips has risen from 99,000 to 117,000, an increase of 18,000 or just 14% of total trip growth.
- The number of 'journeys to work' in Perth have risen from 97,000 to 115,000 over 2006-2016. The number of driving trips has fallen slightly from 46,000 to 45,000.
- Parking supply has also been very flat in the three cities. Supply in both Melbourne and Perth has been trending down since their latest major levy increases (in 2014 and 2013-15 respectively), whereas as we show in **Figure 4.9** Sydney has seen an 'effective' supply decline, i.e. a decline in the number of spaces actually occupied.

Economic Effects

No previous studies have found conclusive evidence of parking levies making a significant difference to a CBD's competitiveness, either positively or negatively. Generally, they find that parking levies helps congestion and (via hypothecated funding) supports mode shift. In theory, the economic effects should be positive with levy funds being reinvested to improve accessibility to the CBD. In practise, it is hard to isolate the effects of the levy itself from the effects of other changes (e.g. transport infrastructure investment, economic cycles). We note that all four cities have continued to grow employment in the levied areas over the long term.

Ison et al (2014) writes that "the attitude of businesses has not been a key feature of the [Sydney levy] implementation" as the levy is low compared to CBD worker incomes and business 'location costs' and driving mode share is below 30%. Ison et al (2014) also note:

"Periodic reviews of the PSL legislation have prompted advocates to argue against the PSL. The Property Council (2004), for example, which advocates for the property industry, argued not so much against the tax per se but for its failure to control congestion particularly in the Sydney CBD. Related to this is the bigger issue as to whether the PSL has the intended 'bite' to encourage behaviour change with little and mostly anecdotal evidence that users are not aware of the PSL being passed directly to car users, whether in dedicated employer spaces or in casual parking. Clearly behaviour change could be stronger if there was greater awareness of the levy and its motivation rather than relying solely on a price signal".

Richardson (2010) notes that one objective of the Perth Parking Policy was "to ensure the economic vitality of the City of Perth", and that in the intervening years "both floor space and employment in the city has grown".

Richardson (2010) also cites a 2007 review of the Perth Parking Policy by Sinclair Knight Merz, which concluded:

"Restraint on the growth of car parking does not seem to have limited the potential of the city centre to grow economically.

“The Perth Parking Policy is likely to have contributed to lower traffic volumes on city streets with lower levels of congestion than would have been the case without this influence”.

Overall, Richardson (2010) concludes that “many developers and their commercial consultants argued that the limitations on parking supply would hold back development in the City of Perth... [but] there is no evidence that this has occurred”.

In a subsequent paper, Richardson (2016) gave a clear endorsement of the Perth levy:

“Even those who were cautious or opposed to the parking policy in the late 1990s now accept that it has been a catalyst (along with improved public transport) for positive change that has enabled the city to grow strongly with less car traffic. This has brought about a major change in mindset at the Perth City Council, where the policy position has changed from ‘Your Car is as Welcome as You Are’ in the 1980s to ‘People First, Public Transport Second and Cars Last’” (Richardson, 2016)

Dale et al (2017a) note that the Nottingham parking levy of £379 per space per year is only a small proportion of the costs faced by businesses, estimated at less than 1% of their turnover. As such it is a very minor factor in their locational decisions. Conversely, there is some evidence from the case studies that Nottingham’s good quality public transport – supported in part by the parking levy – is an incentive for businesses to locate there.

Dale et al (2017a) draw on a range of different data sources including employment data, economic output, commercial property indicators, and case study information from NCC as to why businesses relocated to or away from Nottingham. None of these data are conclusive in themselves, but together they paint a picture of an economically healthy (and growing) city which remains an attractive location for businesses.

Overall, Dale et al (2017a) conclude that “there is strong evidence that the WPL is not having a significantly negative impact on inward investment”. They also find that “Nottingham remains relatively attractive to investors [and] there is emerging evidence from investment case studies that the public transport improvements are playing a role in this”.

Summary

Summarising our literature review and our additional data analysis:

- Commuter surveys have given a range of results, but they all show that a proportion of commuters will switch from driving to other modes in response to a price change.
- Convenience is a big factor in driving/ parking, both for people who currently drive and for those who don’t. 9% of Melbourne public transport users stated that they would shift to driving if they had convenient parking, “irrespective of cost”. Latent demand may be important i.e. if a parking levy makes driving/ parking more convenient, some public transport users may switch to driving even if they have to pay more.
- Fringe Benefit Tax exemptions for parking have perverse effects: they are regressive in tax terms and encourage driving in the places where this is most damaging. They create a deadweight loss.
- Overseas parking levies have led to an increase in parking costs, with some share of that (typically over 50%) passed on to consumers.
- These higher prices incentivise consumers to change behaviour. The lower return to the parking providers also incentivises them to change behaviour. Levy design can shape these incentives.
- We see this behaviour change through mode shift (fewer drivers or at least a smaller proportion of drivers) and fewer spaces being leased by building users.
- We have evidence that the total number of public/ private carparks has fallen in Melbourne and Perth since parking levies were introduced or since substantial price increases occurred. We have

evidence that the effective number of private spaces being used has fallen in Sydney and Nottingham (with suggestive data for Melbourne and no data for Perth).

- For Sydney, the effective number of leased private spaces has fallen by around 20% in the last decade, since the 2009-10 price increase.
- Census 'journey to work' data shows that the number of driving trips over 2006-2016 rose in Sydney and Melbourne and fell slightly in Perth. All three cities saw substantial employment growth over this time, so there was mode shift in percentage terms, even if not in numerical terms.
- Note that the overseas levies don't necessarily aim to reduce the number of people driving, but instead to manage or reduce congestion, or to raise revenue for non-car modes.
- There is no conclusive evidence of parking levies making a significant difference to a CBD's competitiveness, either positively or negatively.
- They do assist congestion and (via hypothecated funding) support mode shift. As such, their effects should be positive in theory, even if they are hard to isolate.
- No growing city, with or without a parking levy, has managed to eliminate congestion. However, the levies have played a role in mitigating congestion and curtailing the number of people who drive, even as total employment has grown.
- Parking levies have usually been introduced as part of a suite of measures, and the way the funds are used is also important. In most cases, the funds are hypothecated for local transport improvements.

References

Booz Allen Hamilton (2005). 'Surface Transport Costs and Charges: Main Report', *Ministry of Transport*, March 2005.

Dale, S., Frost, M., Ison, S., Nettle, K., Warren, P. (2017a). 'An evaluation of the economic and business investment impact of an integrated package of public transport improvements funded by a Workplace Parking Levy', *Transportation Research Part A: Policy and Practice*, vol. 101, pp 149-162.

Department of Treasury and Finance (2010). 'Review of the Effectiveness of the Congestion Levy', *Department of Treasury and Finance*, May 2010

Dutzik, T., Berg, E., Miller, A., Cross, R. (2017). 'Who Pays For Parking? How Federal Tax Subsidies Jam More Cars into Congested Cities, and How Cities Can Reclaim Their Streets', *TransitCenter + Frontier Group*, September 2017,

Grimmond, D. (2017). 'Estimates of costs of road congestion in Wellington', *Greater Wellington Regional Council*, October 2017

Hamer, P., Currie, G., Young, W. (2012). 'Exploring the Impact of the Melbourne CBD Parking Levy on Who Pays the Levy, Parking Supply and Mode Use', *Parking Issues and Policies (Transport and Sustainability, Vol. 5)*, Emerald Group Publishing Limited, pp. 291-316

Infrastructure Victoria (2018). 'Five-Year Focus: Immediate Actions to Tackle Congestion' *Infrastructure Victoria*, April 2018

Ison, S., Mulley, C., Mifsud, A. and Ho, C. (2014), "A Parking Space Levy: A Case Study of Sydney, Australia", *Parking Issues and Policies (Transport and Sustainability, Vol. 5)*, Emerald Group Publishing Limited, pp. 317-333.

Lehner, S. and Peer, S. (2019). The price elasticity of parking: A meta-analysis', *Transportation Research Part A*, vol. 121, pp 177-191.

Nunns, P., Whitaker, E., Donovan, S. (2019). 'Social and Distributional Impacts of Time and Space-Based Road Pricing', *NZ Transport Agency research report 654*.

NZTA (2018). 'Economic Evaluation Manual', *New Zealand Transport Agency*, July 2018

O'Fallon, C., Sullivan, C., Hensher, D. (2004). 'Constraints affecting mode choices by morning car commuters', *Transport Policy* vol. 11 issue 1, pp 17-29.

Pandhe, A., and March, A. (2012). 'Parking availability influences on travel mode: Melbourne CBD offices', *Australian Planner*, vol. 49 issue 2, pp 161-171.

Richardson, R. (2010). 'Extracting Maximum Benefit from Parking Policy - 10 years of Experience in Perth, Australia', *European Transport Conference*

Richardson, R (2016). 'The Role of Parking in Limiting Traffic Growth and Congestion', in S. Biermann, D. Olaru, V. Paül (eds), *Planning Boomtime and Beyond*, Ch. 26. Perth, WA: UWA Publishing.

The Congestion Question (2020). 'The Congestion Question Technical Report', *Auckland Transport and project partners*, July 2020

Treasury (2015). 'Guide to Social Cost Benefit Analysis', *Te Tai Ōhanga The Treasury*, July 2015

Van Ommeren, J., and Wentink, D. (2012). 'The (Hidden) Cost of Employer Parking Policies', *International Economic Review* vol. 53 issue 3, pp 965-978.

Wallis, I., and Lupton, D. (2013). 'The Costs of Congestion Reappraised', *NZ Transport Agency research report 489*.

Appendix 5.1

Parking Inventory Technical Matters and Corrections

As outlined in the body of our report, we worked with an RID output spreadsheet which we received from WCC on 1st September 2020, titled “9800_combined-no-personal-data-4suburbs.xlsx”. We also received a small amount of metadata in a spreadsheet titled “Val_usage_keys.xlsx” and through discussion with WCC.

Number and Categorisation of Parking Spaces

One of the fields in the RID is ‘garage_and_parking’, and this was our main source for information on the number of parking spaces associated with a property (or rateable component).

The RID contains several fields which can be used to categorise properties and parking spaces. These include Land Usage Codes (column header ‘land_usage’) and “Building Category Codes” field (column header ‘category’). They give very similar aggregate results when looking at our three main categories (Residential, Retail, Commercial and Other), but we have followed WCC’s recommendation of using the Land Usage Codes as they are believed to be slightly more accurate.

We have also looked at the Local Government Codes (column header ‘locgovcode’), which are useful for seeing if parking spaces are associated with a non-rateable or 50% rateable property.

Our Adjustments to the RID Spreadsheet

One of the adjustments we made was based on each entry’s value for the column headed ‘app’:

- We have removed all entries that had ‘app = 5’, which indicates a summary for a mixed-use property. These entries were double counts with the individual components of the property, identified by ‘app = 1’. In one of our earlier working papers dated 19/8/2020, we noted that sometimes there were discrepancies between the ‘app = 1’ and ‘app = 5’ totals, more often with ‘app = 5’ giving a higher number of carparks – perhaps because they couldn’t be clearly allocated to one component or the other. This could lead to an undercount of 500-1,000 carparks in our spreadsheet, although not all of these would be leviable.
- We have removed almost all entries that had ‘app = 6’, except as noted below.

Entries added in from app = 6, or adjusted further from app = 6 include:

- 42 Molesworth St (Kate Sheppard Apartments) – 52 parks.
- 30 Taranaki St (Elevate apartments) – 42 parks.
- 29 Frederick St (Croxley Mills apartments) – 30 parks. This is shown under 33 Frederick St in the revised spreadsheet. We have changed the “Building Category” to RA20A to reflect its residential use.
- 58 Victoria St (Chews Lane) – 198 parks which may comprise a mix of commercial and residential. We have assumed all are commercial in accordance with the Building Category code, CXC. This is shown under 60 Victoria St in the revised spreadsheet.
- 298 Lambton Quay (CityLife Wellington) – 16 carparks which may comprise a mix of commercial and residential. We have assumed all are commercial in accordance with the Building Category code, CXC.
- 57 Courtenay Place Te Aro – 25 carparks. A unit-titled office building with no more detailed data available on which carparks belong to which unit.

- 94 Dixon Street Te Aro – 25 carparks. A unit-titled office building.
- 90 The Terrace Wellington Central – 5 carparks. A unit-titled office building.
- 163 Tory St – 8 carparks. A unit-titled industrial building.

We have made the following further adjustments to the raw RID data:

- 55 Cable St (Te Papa) – the RID shows this property as having 0 carparks; we have adjusted it to show 232 carparks.
- 4 Queens Wharf (TSB Arena/ the 'Queens Wharf Carpark') – the RID shows this property as having 0 carparks; we have adjusted it to show 410 carparks.
- 24 Tory Street (the Reading Carpark) – the RID shows this property as having 1 carpark; we have adjusted it to show 103 carparks.
- 279 Wakefield Street (New World Wellington Central) – the RID shows this property as having 2 carparks but this is certainly incorrect. We have assumed the property has 270 carparks, similar to New World Thorndon.
- 106, 116 and 120 Taranaki St (Briscoes) – the RID shows these properties as having zero carparks. We have assumed the property has 28 carparks as per aerial photos.
- 10 Gilmer St (Gilmer Apartments) – we have adjusted the carpark units P1-P14 to show one carpark each and a "Building Category" of RP. No other carparks are associated with the address.
- 111 Molesworth St (Frame apartments) – we have adjusted the carpark units 1-17 to show one carpark each, a Land Usage of 98 and a "Building Category" of RP. No other carparks are associated with the address.
- 39 Taranaki St (Bellagio apartments) – we have adjusted the carpark units P1-P31 to show one carpark each and a "Building Category" of RP. No other carparks are associated with the address.

The following properties should be checked on site:

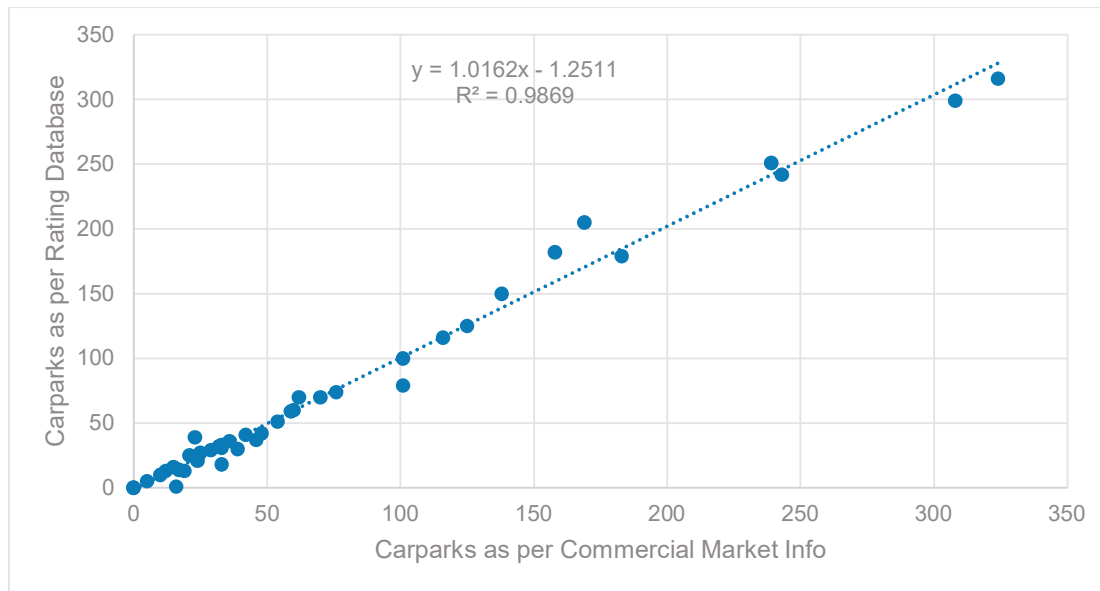
- 72 Tory St: we have removed the 'app = 6' value for this property which shows 777 carparks. The individual components only add up to 456, along with a number individually titled 'carparks' which have zero carparks associated with them. This is probably an underestimate.
- 187 Victoria St (aka Leftbank): we have removed the 'app = 6' value for this property which shows 260 carparks. The individual components only add up to 159. This is probably an underestimate.
- Chews Lane.
- Retail properties – New World Wellington Central, Briscoes, Bunnings.

Data Validation for Office Carparks

We were able to link 44 properties listed in the WCC RID spreadsheet with office buildings that we could find other data on.²³ The two databases showed very close agreement in the number of carparks, as shown in **Figure 4.4** below:

²³ Data sources included Precinct and Kiwi Property annual reports, the Robert Jones Holdings website, and property sale information.

Figure 4.4: Data Validation for Office Carparks



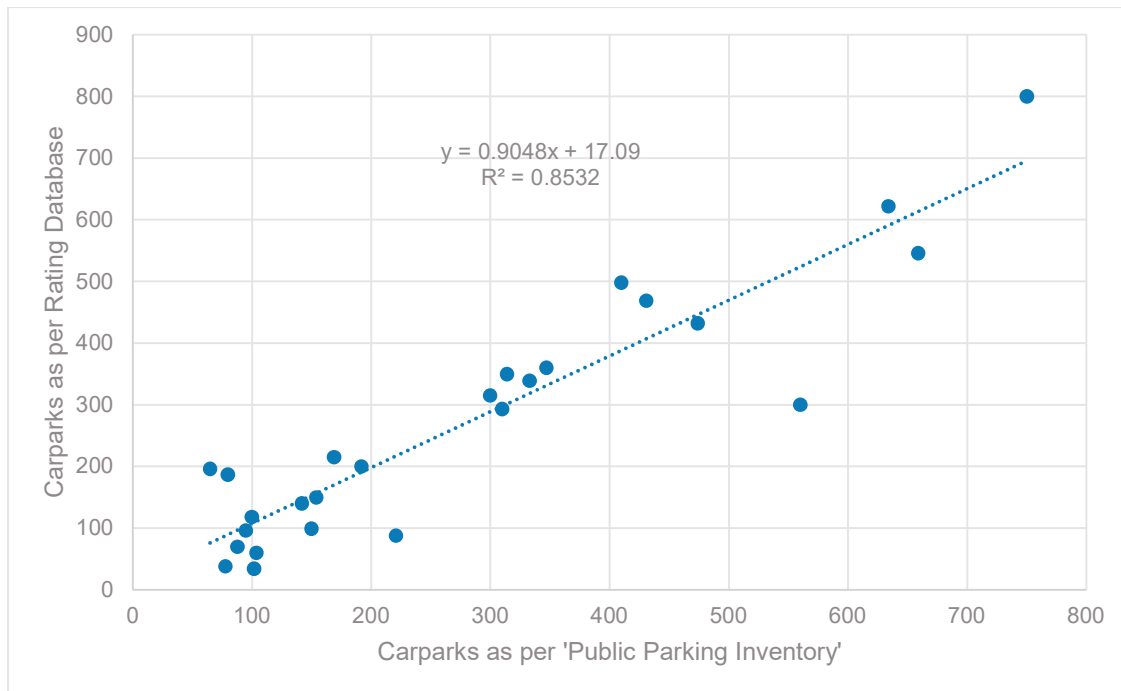
In total, WCC’s database showed 3,198 carparks for these buildings whereas external data showed 3,200 – that is, while the figures for individual buildings can differ, there was no evidence of a positive or negative bias in the data.

One unusual item in the data, though, was the ‘Bowen Campus’ owned by Precinct Properties – not included in **Figure 4.4** above or in the ‘44 properties’ that we linked. The Bowen Campus appears in the WCC database as 34 Bowen St (84 carparks) and 42 Bowen St (102 carparks). From Precinct’s point of view, the campus includes two existing buildings, a third under construction, and a fourth planned. Their 2020 Asset Bible notes 20 and 8 carparks in the two existing buildings and does not comment on any additional carparks (although there may still be some). However, their 2014 Asset Summary showed 202 carparks across the campus prior to redevelopment starting, which is in the same ballpark as the WCC figures. From a look at aerial photography, it seems that a recent redevelopment of an existing building on the campus expanded its floor area and removed some at-grade parking, with more at-grade parking having been lost from the third building starting construction. The most likely explanation is that the WCC database hasn’t been (fully) updated yet to reflect the redevelopments taking place at the Bowen Campus. This would be straightforward to verify with Precinct.

Data Validation for Public Carparks

Excluding the major discrepancies, we found in the RID and which we adjusted, we were able to link 26 additional properties from the RID to our public parking database (this database is described in **section 4.8**). The two databases showed good agreement on the number of carparks, as shown in **Figure 4.5** below:

Figure 4.5: Data Validation for Public Carparks



In total, the RID shows 7,015 carparks for these properties and the “public parking inventory” database shows 7,262. Where there are discrepancies, they appear to be because:

- Some ‘public carparks’ are located within office buildings and the parking operator may not lease/ manage all of the carparks there; some might be directly leased from the building owner to the tenant.
- Two ‘public carparks’, Clifton Carpark and 1 Ballantrae Place, are partially located under the motorway and they are therefore partially excluded from the RID.
- There also appears to be some errors with the Left Bank carpark (187 Victoria St) which we understand to include at least 200 carparks, but with only 88 shown in the largest commercial parking title.

Appendix 7.1

Financial Modelling Data Sources and Assumptions

Data sources

- The WTSM Wellington region transport model forecasts (validated using the Wellington Cordon survey and Census Journey to work data)
- Wellington City Council Rating Information Database (for current car park supply inputs).
- Commercial car park inventory and price analysis undertaken by RCG.
- International demand elasticity literature.
- Demand, supply and levy passthrough data from overseas parking levy schemes (Nottingham, Melbourne, Sydney and Perth).
- Cost information from the Nottingham City Council Workplace Parking Levy scheme.

Literature references

MRCagney. (2014b). *ACT Transport Pricing Study*, ACT Government.

Chambers, L. & Ker, I. (1990). 'Parking: Why, Where and How', paper presented at the *2nd Australian Parking Convention*, Adelaide, 30 September - 4 October 1990.

Halcrow Fox. (1995). *Research into Pricing and Financing of Urban Transport - Final Report*, report to the European Commission, London.

Hamer, P., Currie, G., Young, W., (2009). *Exploring travel and parking impacts of the Melbourne CBD parking levy*.

Kulash, D. (1974a). *Parking Taxes as Roadway Prices: A Case Study of the San Francisco experience*, The Urban Institute, Washington DC.

Kulash, D. (1974b). *Parking Taxes for Congestion Relief: A Survey of Related Experience*, The Urban Institute, Washington DC.

Litman, T. (2004). *Transit Price Elasticities and Cross - Elasticities*. *Journal of Public Transportation*, 7 (2): 37-58.

Marsden, G. (2006). 'The evidence base for parking policies - a review', *Transport Policy* vol. 13, no. 6, pp. 447-57.

Patrick, A. (2020). *Let's Wellington Moving – Travel Behaviour Change Assumptions*. Draft paper for Let's Wellington Moving, 29 May 2020.

Pickrell, D. & Shoup, DC. (1980). 'Employer subsidised parking and work trip mode choice', *Transport Research Record* vol. 786, pp 12-7.

Vaca, E. & Kuzmyak, JR. (2005). *Traveller Response to Transportation System Changes (TCRP Report 95): Chapter 13 - Parking Pricing and Fees*, Transportation Research Board, Washington DC.

Wallis, I. & Schmidt, N. (2003). *Australasian travel demand elasticities - an update of the evidence*. Draft paper – ATRF 2003, 26th Australasian Transport Research Forum.

Wilson, RW. & Shoup, DC. (1990). 'Parking subsidies and travel choices: assessing the evidence', *Transportation* vol. 17, no. 2, 141-57.

Assumptions

Modelling assumptions	
Levy year 1	Beginning 1 July 2025
Levy phase-in	Levy amount ramps up over 3 years
Levy amount, per year (including GST)	4 scenarios modelled: - \$500 - \$1,000 - \$2,500 - \$5,000
GST treatment	GST is included in the levy amount and the price commuters face. GST is excluded in the cost and revenue inputs and outputs in the model.
Levy differential (levy in low-price CBD zone as % of levy in high price CBD zone)	70% (based on difference in current average prices)
Levy pass-through	Public operator run: 60% - 80% pass through (2 scenarios modelled) Private, office building car parks: 50%
Current weighted average parking price (annual)	Core CBD (High price zone): \$5,160 Te Aro + Stadium (Low price zone): \$3,510
Displacement to areas outside the levy catchment area	7% of commuters who decide to no longer park in the CBD due to the levy.

Demand elasticity scenarios available for selection in the financial model

		Elasticity scenario		
		1	2	3
Trip origin sector		Low	Mid	High
CBD	go01	-0.23	-0.39	-0.59
Miramar / Kilbirnie / East	go02	-0.23	-0.38	-0.73
Newtown / Island Bay / Berhampore / Brooklyn	go03	-0.36	-0.43	-0.61
Karori	go04	-0.47	-0.55	-0.88
Khandallah, Ngaio	go05	-0.37	-0.51	-0.75
JVL, Hutt Valley, Northern suburbs, rest of region	go06	-0.38	-0.44	-0.67

Financial assumptions	
Allowance for bad debts	1% of revenue (This is likely conservative. Nottingham City Council has had a very high level of compliance and payment.)
Exchange rate (GBP: NZD)	1.96
Opex contingency	10%
Parking supply assumptions	
Proportion of off-street public car parks that are for casual (short stay) parking	25%
Number of car parks in buildings owned by government entities (estimate)	250
Number of car parks owned by foreign embassies (estimate)	147
Number of car parks in CBD (excluding retail and residential)	22,050
Total CBD car parks including retail and residential	27,660
We have categorised these Land use codes from the WCC Rating Information database as "Not-for-profit":	Community services Religious Recreational Multi-use within community services Active outdoor Passive indoor
Parking demand volume assumptions	
Upward adjustment to WTSM model home-to-work trip volumes to account for: <ul style="list-style-type: none"> • Trips prior to 7am and trips between 9-9.30am • Calibration with Wellington cordon survey data 2019 	5% upward adjustment

APPENDIX 9.1

LEGAL SUMMARY OF OVERSEAS PARKING LEVIES

JURISDICTION	LEGAL FRAMEWORK	BASE	IMPOSITION	RATE	PROCEEDS
Nottingham Workplace Parking Levy ("WPL")	The Transport Act 2000 (UK) empowers local authorities to introduce a "scheme for imposing charges in respect of the provision of workplace parking places" by way of an Order. In Nottingham, WPL is imposed by The City of Nottingham Workplace Parking Levy Order 2008 ("WPL Order").	WPL is charged on a per space basis for private, non-residential off-street workplace parking. Exemptions from WPL include for: employers with fewer than 11 spaces, motor cycle bays, customer parking, emergency services spaces, disabled spaces, loading spaces, and spaces at qualifying NHS premises (see WPL Order, paras 3(6), and 4(3)–4(7)).	Obligation to licence spaces and pay WPL lies with the "charge payer" – that being the occupier(s) of the premises at which the workplace parking is provided (WPL Order, paras 1(3) and 3(2)).	In licensing period 1 Apr 2020 – 31 Mar 2021, WPL set at £424 per space (an increase from £415 per space in the preceding period) (adjusted annually for inflation). The charge payer will be liable for a penalty for non-compliance with WPL Order (see para 9 of WPL Order).	Net proceeds of WPL used in developing transport infrastructure, eg, light rail expansion and redevelopment of Nottingham Railway Station (WPL Order, Annexes 1 and 2).
Melbourne Melbourne Congestion Levy ("MCL")	The Congestion Levy Act 2005 (VIC) ("CLA") imposes MCL on parking spaces in central Melbourne (divided into Category 1 and 2 areas).	MCL imposed on off-street, non-residential parking spaces within Category 1 and 2 areas on a per space basis. Exemptions from MCL include for: business visitor spaces, emergency vehicle spaces, councils and charities, shift workers in 24/7 premises, and loading bays (see CLA, Part 4). Note: concessions may apply where parking spaces are partially used for exempt	The owner of premises containing leviable parking spaces is liable to pay MCL (CLA, section 9).	Two rates of MCL: currently \$1460 per space for Category 1 areas, and \$1040 per space for Category 2 areas (adjusted with reference to the Consumer Price Index). Note: in Sept 2020, the Victorian government announced a 25% waiver of 2020 MCL liabilities, and an extension to the payment deadline.	Some revenue used for public transport improvements (although not specifically hypothecated in the CLA).

JURISDICTION	LEGAL FRAMEWORK	BASE	IMPOSITION	RATE	PROCEEDS
		purposes (see CLA, Part 4, Division 2).			
Perth Perth Parking Levy ("PPL")	The Perth Parking Management Act 1999 (WA) ("PPMA") imposes a licensing regime for all non-residential parking bays within the Perth Parking Management Area ("Management Area").	Non-residential parking bays within the Management Area must be licensed, with the corresponding PPL paid (if any). Exemptions from paying PPL include for: businesses with fewer than six parking bays, motorcycle bays, loading bays, disabled spaces (see Schedule 2 of the Perth Parking Management Regulations 1999 (WA) ("Regulations").	The owner of parking bays within the Management Area must apply for a licence and is charged the relevant amount of PPL (if any). A penalty applies to owners who permit a vehicle to be parked in a bay without a licence (PPMA, section 7).	PPL rates are currently \$1,038.90 – \$1,169.20 per parking bay (depending on location, and duration of availability).	PPL proceeds used to fund Central Area Transit bus system, Free Transit Zone, and other transport infrastructure projects.
Sydney Parking Space Levy ("PSL")	The Parking Space Levy Act 2009 (NSW) ("PSLA") imposes PSL on parking spaces in central and north Sydney (Category 1) and four outlying business areas (Category 2). The details of PSL are contained in the Parking Space Levy Regulation 2019 ("PSLR").	PSL imposed on a per space basis on off-street, private, non-residential parking. Exemptions from PSL include for: bicycle / motorcycle spaces, disabled spaces, and loading bays (see PSLR, clause 8). Further exemptions for certain retail, hospitality and other spaces in Category 2 areas only (see PSLR, clause 8(5)).	The owner of leviable premises (which is defined to include a lessee or licensee thereof) is liable for payment of PSL. If the premises are jointly owned, the owners are jointly and severally liable (PSLA, section 8).	For the period beginning 1 Jul 2019, PSL rates are \$2,490 per space in Category 1 areas, and \$880 per space in Category 2 areas. Note: PSL payments deferred six months (from March to September 2020) to provide cash flow relief to businesses in light of Covid-19.	PSL proceeds paid into Public Transport Fund, which is used to finance and encourage the use of public transport (PSLA, section 11).

APPENDIX 9.2

SUMMARY OF NEW ZEALAND PRECEDENTS

Regional fuel tax

- Under the Land Transport Management Act 2003, a regional council may propose a RFT across all or part of its region.
- The relevant regional council must consider that there are one or more capital projects that would benefit the region (or the relevant part thereof), are included in the regional land transport plan, and cannot reasonably be fully funded from sources other than a RFT within the time frame desired.
- The proposal to establish a RFT scheme must be set out in the prescribed form and submitted by the relevant regional council to the Minister of Finance and the responsible Minister for consideration. These Ministers retain complete discretion to approve or reject the proposal.
- Once approved, the RFT scheme is given effect by Order in Council.
- Once a RFT scheme is in place, a regional council may propose variations (including, for example, in respect of the "area that is subject to the RFT scheme"), or to replace the RFT scheme. Such proposals again require Ministerial approval and are given effect by Order in Council.
- Certain exemptions from the RFT are set out in the Land Transport Management Act. For example, the Act contains a concept of "exempt uses" of fuel in respect of which no RFT is leviable, eg, the use of fuel in electricity generation, or in the manufacture of refined fuel products at a refinery.
- Given these key exemptions are "embedded" at the primary legislation level, they are "universal": any RFT scheme imposed under the Act will be subject to those same exemptions.
- A regional council operating a RFT scheme must operate a reserve fund into which all funds from the RFT are paid, and from which payments can be made only in support of the programme of capital projects of the RFT scheme.

Local authorities fuel tax

- Under Part 11 of the Local Government Act 1974, local authorities (who are grouped together by region into so-called "tax areas", eg, Wellington-Hutt Valley) are empowered to levy LAFT on the delivery/use of all "specified engine fuel" within their boundaries.
- Under the LAFT regime, local authorities have a choice of three different "scales" (ie, rates) at which to set LAFT, as prescribed in a schedule to the Act.

Waste Disposal Levy

- The Waste Minimisation (Calculation and Payment of Waste Disposal Levy) Regulations 2009 require waste disposal facility operators to file periodic returns with the levy collector, containing certain information relevant to the operator's levy liability.
- The regulations further provide for:
 - how the levy collector is to calculate the levy payable by the facility operator.
 - the requirement for the levy collector to furnish an invoice; and
 - the due dates for payment of the levy (and any interest on unpaid levy) by the facility operator.
- The regulations require facility operators to retain certain records for at least seven years after the payment of the levy to which the records relate.
- Any of the records may be requested, in writing, from the operator of the disposal facility by the levy collector or the Secretary for the Environment.

- Section 65 of the Waste Minimisation Act 2008 supplements these requirements by providing that a person who contravenes the regulations, or who knowingly supplies false or misleading information thereunder, or makes any material omission in terms of such information, commits an offence and is liable on conviction to a fine not exceeding \$100,000.
- Money received from the waste disposal levy by a territorial authority may be spent only on matters to promote or achieve waste minimisation, and in accordance with the territorial authority's waste management and minimisation plan.

APPENDIX 10.1

Suggested future work actions

This report has identified a number of further work actions including:

General

Scheme development through to Business Case approval

- Further support studies eg WTSM, financial and economic modelling all updated.
- Measures and monitoring eg on street parking audits and parking audits/management schemes developed where displaced parking predicted.
- Parking Levy scheme development eg tailored design, operational review, communications plan.
- Parking Levy legislation/regulatory scheme development and ongoing communications with Ministries.
- Identification of how Parking Levy revenue will be used to fund LGWM work packages.
- Project Management – eg risk management, governance stakeholder and communications management.

Stakeholder/public consultation through to approvals

- Consultation on Parking Levy Draft Act through to Ministerial approval.
- Public Consultation preparation eg materials and programme.
- Carry out public consultation eg events.
- Parking Levy approval eg business case, WCC approvals, LGWM Board approvals.
- Parking Levy scheme development eg detailed scheme design, specification and procurement.
- Ongoing project management.

Implementation through to operation

- Parking Levy Draft Act consented.
- Parking Levy implementation eg education and engagement, communications/marketing, IT front and back-office support, Parking Levy management and enforcement team recruitment and training, Parking Levy equipment and infrastructure, operational policies and procedures.
- Parking Levy scheme goes live – recommend no charge for first 6 months to allow licensing of all leviable spaces to take place.
- Parking Levy charging commences after 6 months (to provide enough time to allow WCC to work with off street car park occupiers/operators to ensure they have obtained a Parking Levy licence and are licensed correctly) - eg compliance, enforcement, business support, ongoing communications – at this point Parking Levy costs would be funded by the Parking Levy revenue stream.
- Ongoing project management.
- Ongoing communications.
- Ongoing monitoring and evaluation.

Parking Management Plans

Supporting parking management plans that may need to be put in place prior to the implementation of the Parking Levy to mitigate any displaced parking. The following approach is recommended:

- Using the outputs from the Financial Model as a starting point, assess existing usage of all CBD/CBD fringe on street parking to provide a detailed hotspot mapping of all locations where displaced parking could occur (eg around employment centres and residential areas). This would then enable accurate assessments of the appropriate parking management measures required to tackle any displaced parking as part of the implementation and ahead of the Parking Levy go live. This could include:
 - Information on each business in the area plotted with the amount of car parking places liable for the Parking Levy, current public transport infrastructure, restrictions/orders already in place and businesses highlighted with current Travel Plans.
 - Assess the walking conditions from these parking areas to the CBD eg distance (1 km is a circa 12-minute walking journey to the CDB edge), terrain (steep hills, exposure to weather conditions) and other issues such as lighting (re pedestrian safety).
 - Education establishments in the area, such as schools and colleges, to be taken into consideration.
 - On site surveys including AM, PM and specific out of hours visits to ascertain the scope of commuter parking.
 - Areas mapped with definitive boundaries within the Parking Levy parking inventory GIS database.
- Take into account any WCC proposed parking management programmes such as changes to resident parking schemes, changes to coupon parking, changes to 9hr/10hr metered parking, changes to review of free unrestricted and free restricted (eg clearways) parking, existing Council Reserve Management parking areas, intersection protection and updating lining and signing could then be accelerated pre–Parking Levy. These would be implemented with the intention of mitigating the risk of any potential displaced parking materialising especially in residential areas and minimising any potential Parking Levy income loss.
- Each area is likely to require different measures to effectively manage any existing issues and any potential hotspot locations and the solutions would be different and bespoke in each area. Therefore, the approach should not be a “one size fits all” but an in-depth analysis of each area, concluding with a complementary forward programme of works and appropriate solutions.
- By producing individual area solutions and reports, clear measures will become apparent that demonstrate a sustainable, cost effective way of delivering Parking Management measures likely to address locations of displaced parking and ensure the smooth implementation of a Parking Levy scheme, minimising any negative impact on the reputation of the scheme and maximising income generation (eg by introduction of new charges where appropriate).

Good practice would be to choose a pilot area, possibly where businesses flank residential and scope it to see what the potential impact could be and identify the viable solutions to address this. This would then inform which relevant scoping/assessment studies should be written for every area prior to introduction, to safeguard both the reputation of WCC and the Parking Levy scheme itself and maximise any income generation.

Other Parking Levy Scheme specific future work actions

- Suggestions for updates to the WTSM strategic model.
- Scope for the Parking Levy to include existing on street Coupon commuter parking and 10-hour max meter parking within the Parking Levy boundary.
- Scope for the Parking Levy Boundary to be wider than the CBD boundary
- Review options for exemptions
- Review option to Apply Levy to CBD residential parking spaces leased to Commuters.
- As part of future work on the Parking Levy and the TBC SSBC, further work to identify high tech options (eg charging by use of a parking space by day rather than an annual charge) should be explored and appraised.
- Future work on the Parking Levy will provide a detailed description of how risks and uncertainties have been taken into account in the design of the Parking Levy.

Legal

- Develop a Central Government engagement strategy to test the level of support for, and any Central Government concerns regarding, the proposal to implement a Parking Levy Act.
- Provide input (working with the relevant Ministries) on the design and drafting of a Parking Levy Act, or, if Central Government prefers that the Act be a local Act, drafting that Act; and
- Design the Wellington specific elements of the WCPL (eg, setting the rates, determining boundaries, and appropriate exemptions).

Economics

- Future work on the equity of a parking levy should look at existing inequities – such as noise and air pollution and the FBT exemption for employer-provided parking – as well as the cost/ accessibility implications for people living in different parts of the region.
- The parking levy should be considered against existing revenue tools for Wellington (general rates, targeted rates and in particular the existing transport targeted rate)
- The parking levy should be considered against other potential revenue tools (e.g. a cordon charge, congestion pricing, a regional fuel tax)
- As noted in section 5.3, Melbourne’s parking levy applies to residents who lease out their spaces to commuters. It would be worthwhile to discuss the practicalities of this with the levying authority.

The TWG identified the following key work actions

- The congestion reduction benefits of the parking levy require further modelling and results are pretty indicative at this stage. This should be a priority in the next stage of work.
- The proposed Parking Levy has benefits of less deadweight loss, as compared to other means of funding LGWM. This is a benefit that has not been fully quantified, as we have not examined the deadweight loss of rates funding and NLTP funding LGWM. This quantification should occur at next phase.
- The current recommended scope of the parking levy is the CBD downtown business targeted rate boundary, per the RFP stipulation that the boundary be the CBD. The consultants have identified that outside of the CBD in Wellington, there are three main areas which may attract significant commuter traffic that passes into and through the CBD during the morning peak (Massey University/Mt Cook, Wellington Regional Hospital/Newtown, Victoria University/Kelburn). It is recommended that, as part of the next phase of work, LGWM consider analysing boundary areas to include these areas. WCC

agrees with this suggestion and note that inclusion of these areas is likely to substantially change the impacts of the parking levy.

Further work identified in the vlc Peer Review report included:

- *“We suggest further work continue to develop evidence of the problems the CPL seeks to address. That includes background information on future mode share, network performance, and revenue shortfalls.*
- *We suggest further work develop a detailed BAU scenario to inform the assessment of the effects of the*
- *CPL. This BAU scenario would likely use existing funding options, such as general rates and targeted rates, to fund a scaled down package of transport improvements.*
- *We suggest further work consider alternatives to the CPL, including but not be limited to regional fuel taxes and road pricing. Though we understand LGWM has received political direction on these alternatives, we observe (1) political direction can shift in response to new information, such as the need for legislation to enable the CPL, and (2) consideration of alternatives can highlight the merits of the CPL vis-à-vis alternatives, e.g. the latter’s relatively low collection costs.*
- *The need for legislation to enable the CPL (the “Parking Levy Act”) is a risk. For this reason, we suggest further work continue to develop options for alternative legislative arrangements, such as amendments to Schedule 3 of the Local Government Rating Act (LGRA)—even if the latter is inferior to standalone legislation.*
- *We suggest further work present analyses of the spatial distribution of economic benefits and costs associated with the LGWM programme. Such analysis would serve to buttress claims of net positive effects for the CBD.*
- *We consider the need for enabling legislation poses a major, albeit apparently unavoidable, risk to the implementation of the CPL. Given this risk, we suggest LGWM continue to work with stakeholders to develop fall-back options to the CPL, even if these options are less preferred.*
- *Implementation Route Map and Indicative Timescales: We suggest further work seek to clarify interactions between timelines for the LGWM programme as a whole and the CPL.*
- *Impact of parking cost increases: We are intrigued by the finding that people who commute regularly (five days per week) are less likely to change in response to an increase in the costs of parking. It would be useful for further work to explore these relationship*
- *Residential Parking Spaces: The Study notes residents in Melbourne who rent parking spaces to commuters are liable to pay the parking levy. The test for the liability of resident’s seems to be if they rent their spaces to “non-residents”. We suggest it would be useful to expand on this discussion, as it provides a potentially useful example of how policy settings can mitigate the risk of arbitrage between residential and commercial parking supply. We are especially interested in how “non-resident” defined and how enforcement is managed.*

Enabling legislation further work

- *We suggest further work seek to mitigate risks associated with the preferred option, for example by presenting an expanded discussion on alternative (albeit less preferred and/or less feasible) options including but not limited to:*
- *General rates, that is, what increase in general rates is required to raise equivalent net revenue to the CPL?*
- *Targeted rates, that is, what increase in targeted CBD rates is required to raise equivalent net revenue to the CPL? NB: Later sections suggest double.*
- *Regional fuel tax, that is, what level of regional fuel tax per litre is required to raise equivalent net revenue to the CPL?*
- *Road pricing, that is, what are the parameters (e.g. costs and effectiveness) of a road pricing scheme that raises equivalent net revenue to the CPL?*
- *Alternative legislative arrangements, that is, rather than a dedicated act, what if parking levies were enabled via an amendment to Schedule 3 of the LGRA?*
- *An expanded discussion of alternative options seems to offer two main benefits: o First, we observe that political direction can and does shift over time in response to new information and evidence. The need for the CPL to be enabled by a standalone legislative act, for example, strikes us as an example of the sorts of information that can give rise to shifts in political direction.*
- *Second, an expanded discussion can serve to highlight some of the merits of the CPL. The latter, for example, is more targeted than general rates, targeted rates, and a regional fuel tax. And, compared to road pricing, the CPL incurs much lower administrative costs (by a rough estimate, at least 50% lower).*
- *Alternative legislative arrangements include but are not limited to amendments to Schedule 3 of the Local Government Ratings Act (2002), which identifies “Factors that may be used in calculating the liability for targeted rates”. Such an amendment might seek, for example, to expand Clause 12 to include explicit reference to the number of parking spaces (NB: Our reading of Section 9.0 is that the absence of any explicit reference to parking spaces in Schedule 3 is the primary source of material legal uncertainty as to whether a parking levy could be implemented under the LGRA. We return to this point in more detail in our comments on Section 9.0). We present this only as an example of alternative legislative arrangements that might be pursued in the absence of a standalone Parking Levy Act. Given the risks of the latter, we suggest there is merit in LGWM continuing to explore such options. We appreciate such legislative amendments are not ideal, in the sense that existing legislation is not always compatible with aspects of the CPL and come with their own risk profile. Implementing a parking levy via amendment, for example to the LGRA, raises the risk that the purpose of the levy is subverted by other parts of the relevant act, such as its principles.*

Financial modelling

we suggest further work could provide insight into how changes in the level of the levy interact with financial and economic outcomes (NB: We appreciate some aspects are discussed in Section 8.0), e.g.:

- *Administration costs. The costs of administering the CPL seem likely to be largely fixed, i.e. they do not vary with the level of the levy. For this reason, setting a higher-level leads to fiscal “economies of scale”.*
- *Congestion benefits. As congestion is an upwards sloping function of demand, we expect marginal congestion benefits will be highest at low levels, i.e. congestion benefits per vehicle kilometre will decrease as the levy increases; and*

- *Negative consequences. The CPL is likely to stimulate some (albeit small) unintended negative consequences, specifically arbitrage between (1) residential and commercial parking and (2) relocation from CBD to non-CBD locations. We suspect these negative consequences are likely to be an upwards sloping function of the level of the levy.*

Economic appraisal

- *Conventionally, social benefit cost analysis of transport policies in New Zealand make use of a discounted cashflow model (DCM). In simple terms, these models estimate the net present value of the estimated stream of benefits and costs associated with a project for a given time horizon, where the ratio of NPV benefits and costs yields the “benefit-cost ratio”. The processes and parameters governing such analyses are set out in detail in NZTA’s Economic Evaluation Manual (EEM).*
- *To ensure consistency and comparability with other parts of the LGWM programme, we suggest further work adopt the conventional processes and parameters as set out in the EEM. Of course, departures from the EEM guidance are possible where warranted by the context and when supported by evidence.*
- *We describe this conclusion as “preliminary” because of the need for more further analysis, for example strategic transport modelling of the wider LGWM package. The latter will be useful for understanding the significance of some aspects of induced demand, such as that associated with re-routing via the city centre”.*

Appendix H: Disruption scenario report and visuals



December 2020- FINAL

LGWM Travel Behaviour Change Package

Keeping Wellington moving through periods of disruption

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WSP New Zealand

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Appendix 1 – Communication Tools

Appendix 2 – Disruption Scenario Impact Graphics

Appendix 3 – Traffic Through Intersections in the CBD

Appendix 4 – Off-Peak Travel Bus Fare in Wellington

Appendix 5 – Disruption Scenario Infographics

1 Setting the scene

Let's Get Wellington Moving (LGWM) is an ambitious programme that aims to achieve a vision of moving more people with fewer vehicles to and through the Wellington City Centre. The suite of projects within LGWM will deliver improvements to the capacity, performance and reliability of public transport, as well as improvements in active transport networks. However, delivery of these city-shaping transport projects will result in disruption as they are constructed.

A Travel Behaviour Change (TBC) package forms part of LGWM and its role is both to influence travel choices in the longer term to achieve and sustain a mode shift, but also to minimise the disruption associated with construction and service changes.

This write up provides an analysis of four disruption scenarios and the targeted TBC strategy that will help to minimise their impact (see Figure 1-1 for locations of the four disruption scenarios).

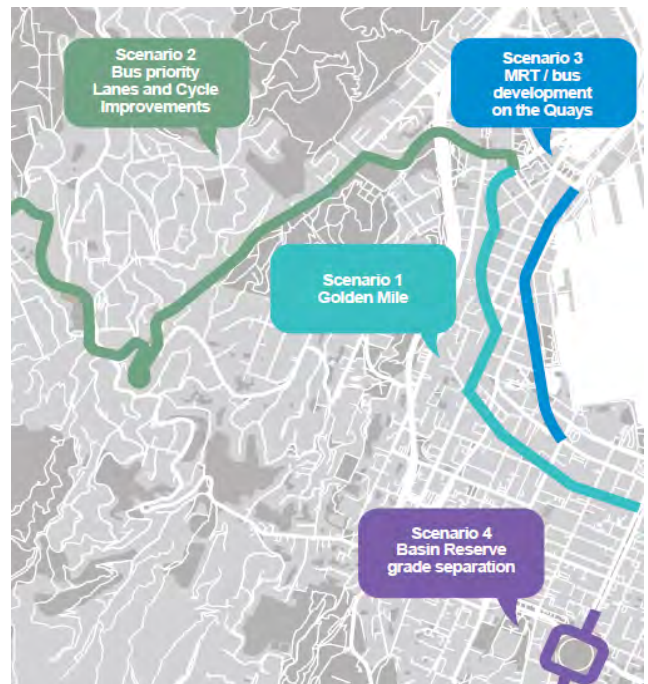


Figure 1-1 Map of disruption scenarios

The overall strategy is to ease pressure on Wellington roads while supporting people to make informed travel choices that are right for them, both during periods of disruption and in the long-term by:

- making sure people are aware of upcoming changes and how these might affect their journeys
- helping people to understand their travel options during periods of disruption
- managing travel demand so Wellington City can keep moving
- leveraging the disruption to encourage travel behaviour change away from driving.

The disruption scenarios that this document addresses are:

- Scenario 1: Disruption to the central city associated with delivery of Golden Mile improvements
- Scenario 2: Linkages to the suburbs through bus priority lanes alongside cycle improvements, using Karori to the City as an example
- Scenario 3: Network disruption associated with MRT / bus development on the Quays
- Scenario 4: Network disruption associated with the Basin Reserve grade separation

Note: At the time of writing, planning the delivery of other LGWM workstreams is still underway with multiple options under consideration, there is too much uncertainty to quantify time impacts or the varying levels of impact of disruption by mode. Some workstream options may happen simultaneously, exacerbating disruption over a shorter period of time, others may be staggered reducing the level of disruption, but construction will continue over a longer period. For many projects the level of delays will change as delivery progresses. Quantifying disruption at this point of time without understanding the construction sequence or the timing of new services is challenging. This report aims to generally quantify what the disruption is, who will be impacted, what it means for customers and identify targeted TBC interventions to mitigate the disruption.

A 1-page A3 graphic accompanies each of the four scenarios.

2 Core themes, approaches and activities common to all scenarios

Each disruption scenario is discussed separately in the section following this one. This section discusses items that are expected to be common to all scenarios.

2.1 Core themes

Any disruption-related communications should be easily identifiable as such. Creating core themes will help customers to recognise disruption messages and the themes can also roll through to TBC campaigns focused on longer term change.

Figure 2-1 presents the core themes that would be used in messages and campaigns. Translating the themes into Māori could bring an Aotearoa flavour to them and provide a more direct link to any TBC initiatives that engage with iwi.



Whāiti

Whakawhāiti i ngā haerenga huakore

Ara tika

Whāia ngā ara e wātea i ngā mahi hangahanga.

Wā tika

Panonitia ōu whakaritenga kia wātea ake ngā huarahi

Momo waka

Whakamanahia ngā momo waka rerekē

Figure 2-1 Disruption scenario travel behaviour change strategy: core themes

An explanation for each theme follows:

- Rethink: this underpins all of the other messages
- Reduce: avoid unnecessary travel
 - Consolidate deliveries
 - Work from home some days
 - Use technology: tele/video conference

- Re-route: avoid areas of construction
 - Use alternative routes where possible
 - Consider all modes of travel
- Re-time: travel outside of busy periods
 - Travel outside busy times
 - Hold meetings between 10am and 3pm to maximise flexibility during peak times
 - Use public transport at less busy times for a more reliable and comfortable journey
- Re-mode: encourage a shift away from car driving
 - Walk or cycle for short trips
 - Walk/cycle or take the bus to work
 - Encourage kids to be travel to school independently

Similar themes have underpinned other successful behaviour change campaigns including Toronto’s Smart Commute Initiatives (Canada), the London Olympics and the Sydney Travel Choices Programme in Australia. See examples in Figure 2-2.



Figure 2-2 Left: Smart Commute Initiatives in Toronto, Canada (TWBG 2018); Right: Sydney Travel Choices Programme in Sydney, Australia

The themes formed part of Transport for London’s ‘Get ahead of the games’ campaign during the London Olympics (see Appendix 1 – Communication Tools, Transport for London Olympics Travel advice).

COVID-19 has demonstrated the ‘proof of concept’ for working from home, with many workers and businesses now used to flexible hours and working from home, making it a viable choice for some workers during a period of disruption. As part of the core themes, the TBC governance group could encourage people to work from home, however they will need to decide to what degree this can be pushed as there will need to be consideration of the economic impacts on city centre businesses. An alternative to encouraging working from home could be to encourage re-timing of trips to the off-peak.

Using the reduce, re-route, re-mode, re-time themes could also support post-disruption messaging to ‘return’ or ‘re-set’ that might signal the end to a disruption period and encourage people back into the city, making use of new active and shared mode improvements.

For all disruption scenarios, it is assumed that the construction will be managed in ways that minimise the impact on people walking, on bicycles and for bus users by providing wayfinding and well-considered routes past construction sites, communicating alternate routes or re-routing bus services when necessary.

2.2 Management (Governance)

A TBC programme during disruption will need to have a unified and integrated management. The TBC programme should establish a group of leaders and representatives who will work together to:

- Lead by example
- Be the guardians of any TBC brand and approach
- Ensure the TBC messages are cohesive
- Reach out to employees or others that they represent to get messages to the right audiences.

The initial governance group could begin with LGWM partner organisations and workplaces that have travel plans and could later grow to become a Transport Management Association (TMA). The establishment of a TMA would create efficiencies and a pathway for organisations who do not have the resources to create a bespoke travel plan programme. Efficiencies would include shared messages, services and the critical mass needed for various initiatives.

2.3 Key messaging

This section covers off some of the key messages for LGWM Disruption TBC campaigns.

Wellington City is changing, for the better. Over the next decade, improvements will be made to the Wellington city transport network and this will result in construction related disruption.

Key messaging prior to disruption will be focused on raising awareness of the disruptions and how they will impact people:

- Improvements are being made to the transport network that require construction and this will disrupt some journeys to and through the Wellington City Centre
- We will do our best to minimise the disruption
- Roads will be significantly busier and may have less space for private vehicles
- Journeys will take longer than usual.

Key messaging will be focused on encouraging people to rethink their travel:

- You can help - drawing on the 'being a good citizen' motivator
- 'Travel better' or 'Travel sustainably'
- 'Try a new way'
- Plan ahead
- For a more reliable journey, consider using active and shared modes, particularly during peak travel times
- Along some routes, walking and cycling will be disrupted, lookout for information and instructions
- Consider working flexibly (travelling in later or earlier) or from home (where possible, on certain days)
- Avoid travelling at busy times
- Avoid driving or taking a taxi/Uber to and through the city centre, use recommended routes that take you around the construction zones
- Walk or bike for short distances as opposed to taking the bus for a one stop hop, driving or taking a taxi/Uber
- Encourage independent travel to school for students

Key messaging following disruption will be focused on encouraging people to 'return' or 're-set':

- Signal in advance the end to each disruption period
- Encourage people back into the city
- Inform people of new active and shared mode improvements
- Encourage people to continue with their habits of using active and shared modes
- 'Share the love' by supporting businesses impacted by disruption.

Specific cohorts that will be targeted include:

- **Employees** – Plan ahead if they must travel for work, consider working flexibly or try travelling outside peak times, PT and cycling may be disrupted however shifting to driving will result in increased delays
- **Employers** – Review existing policies and procedures, especially regarding working from home and flexible working
- **Residents** – Plan ahead if travel is required during disruption, choose the right mode for the right trip
- **Schools** – encourage use of active travel, discourage driving or dropping off children unless necessary
- **Wellington Hospital and Airport-** allow more time for your trip, communicate about travel choices.

2.4 Communication tools

Communicating the right information, to the right people, at the right time and in the right way will be key to the success of the disruption TBC campaign.

A successful communication strategy for the disruption scenarios will involve using a range of communication channels to reach the intended audience. Some people rely on social media, while others may be more used to seeking out information via radio, or in printed form. People with physical or visual disabilities may require information to be provided in different formats. Some of the communication tools that will be used include:

- Internet
- Operator and local authority websites
- Mobility as a Service platform (with push alerts)
- Journey Planning apps or commuter incentive platforms
- Gamification apps e.g. Love to Ride
- Print and broadcast media, including newspapers and local radio (ads and interviews)
- Bus stops – real time passenger information (RTPI) screens and printed notices
- Geofenced marketing campaigns on social media
- Posters on buses and key routes
- Messages at bus stops
- News (Stuff etc.) - via interviews and press releases
- Social media and social media influencers
- Mapping platforms (Google maps, etc)
- Stakeholder networks
- Some mailbox drops
- Helpline or messaging service

Information will also be translated into commonly used languages where a language barrier exists, translation requirements will be determined by working with existing communications teams within government. See Appendix 1 – Communication Tools for commonly spoken languages.

Communications will come to customers via a number of media channels and these could be communicated directly from services providers, through LGWM, via government or through employers, businesses, schools or other organisations such as user groups or local iwi.

To ensure consistency and to make sure all relevant marking and communication occurs in a timely fashion, by the right entities and to the right people, a Communications Plan will provide relevant information to be distributed to shops, commuters and residents who may be directly impacted by loss of parking, other disruption impacts. The intent is to prepare for and adapt to the changes in the transportation network. Key components of a Communication Plan will include:

- Ensuring consistent and timely communication
- Planning and managing disruption related communication (including events)
- Coordinating real-time information
- Ensuring real-time bus stop info is still provided through disruption or provide an alternative
- Communicating user profiles
- Communicating construction schedules; and
- Using communication channels where more information can be obtained e.g. an interactive tool to communicate city-wide disruption and improvements. The LGWM website already provides some of this information.

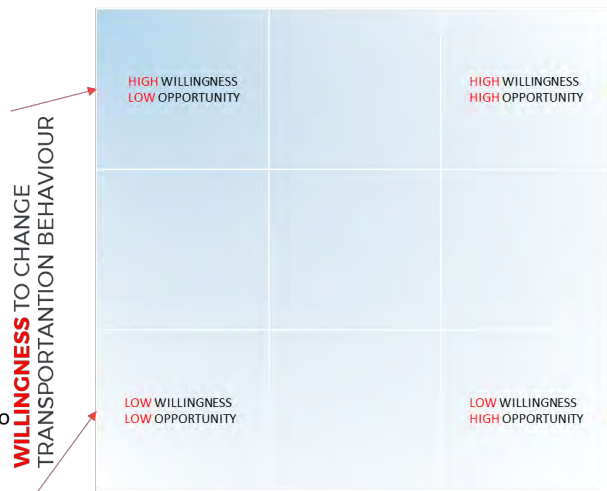
See more examples of communication in Appendix 1 – Communication Tools.

2.4.1 Market segmentation

A market segmentation conceptual framework is a useful tool to understand the opportunity and willingness to change travel behaviour. This is represented in the market segmentation conceptual framework shown in Figure 2-3. This framework was developed based on established theories of travel behaviour and behaviour change. It represents the potential for behaviour change based on a matrix of people's level of willingness (characteristics of the person) and level of opportunity (contextual factors).

Driving despite a preference not to. Behaviour is shaped by the context. Focus on understanding what contextual factors need to and can change to enable preferences to be expressed (e.g. transport system & urban form improvements, flexible working, etc)

Driving, no preference to change and context not supportive of change. Focus on working from home and peak-spreading where possible.



Likely already driving less. Support maintaining less driving. Prevent regression into driving when contextual factors change (e.g. stage of life change, moving house or job etc).

Driving despite supportive context. Not amenable to change. Focus on increasing amenability (e.g. breaking habits, changing perceptions and attitude, shifting norms)

Figure 2-3 Market segmentation conceptual framework

For each disruption scenario, people will fall into these quadrants for some or all journeys. It will be the role of the TBC strategy for each disruption scenario to target cohorts along this spectrum, nudge them towards higher willingness, and create more opportunities for the shift away from driving.

Soft measures and marketing-based approaches as part of the travel behaviour strategy may change willingness as messages 'sink in' and as travel options are improved, peoples' willingness to change their travel behaviour will also increase.

2.5 Travel Plans

It would be beneficial to establish, or boost travel plans of the disruption period so that organisations are set up and ready to respond to the disruption by promoting or incentivising the use of shared and active modes, encouraging flexible working or working from home where practical.

During disruption, travel plans can focus on reducing trips or mode shift and have the potential to collectively reduce congestion from a number of angles including event travel plans for major events at the waterfront, Te Papa and the Basin Reserve. Construction worker travel plans could reduce the number of construction vehicles travelling to construction sites in the city.

The existing programmes run by GWRC and WCC provide a solid foundation from which LGWM can build. Increasing the number of school travel plans in the GWRC programme could reduce parent drop-offs and increase the use of active travel, reducing the impact of compounding disruption at schools near the scenarios outlined in this report. Expanding participation in the well-

established GWRC workplace travel plan programme could encourage greater levels of working from home during disruption periods, traveling outside of peak times and using active and shared modes at least once a week to achieve trip reduction across the transport network. Signing on even more major employers who will be impacted by disruption, such as the Wellington Hospital Travel Plan, which is currently being developed, will only benefit the broader transport system which will be more stressed than usual during peak travel times paired with disruption.

The establishment of a TMA would allow organisations to create shared messages or services, which will provide efficiencies and offer a path to participate when an organisation doesn't have the resources to create its own bespoke travel plan.

Travel plans usually include the following:

- Information on current travel patterns of the targeted cohort (generally a workplace, community or schools/universities)
- Trip reduction or mode shift targets
- Incentives and rewards
- Disincentives, fees or charges
- Events and challenges
- Safe routes (work, to school or to the local public transport hub)
- Communication strategy
- Action plan (who will do what)
- Implementation plan – who will be responsible for delivery, timeframes
- Monitoring, measuring and evaluation mechanisms

Specific initiatives could include:

- Working from home/flexible working toolkit for employers with initiatives like encouraging staff to scheduled meetings between 10am-3pm to allow flexibility for staff at peak travel times
- Continue to work with businesses to encourage implementation of travel plans (including revising their flexible working policies) and participation in the TMA
- Central government, as the largest employer in Wellington, could lead by example by boosting existing travel plans, or developing and implementing new ones, encouraging public servants and Crown Entity employees to lead the change
- Timely communication about disruption through established channels (e.g. website, newsletter, social media) and through existing partnerships like the GWRC travel plan programme and via the TMA or Chamber of Commerce
- Provide insurance (guaranteed ride home scheme; bike breakdown and maintenance service) for employees to increase confidence in using active and shared modes
- Use commuter incentive platforms or gamification to encourage, nudge and reward change: campaigns, car free days, walk/ bus/ bike to workday
- Awards & certificates/ recognition e.g. Cycle Friendly Employer/ School etc., or recognition for exceptional TBC program, best plan for disruption 'We're ready to Keep Wellington Moving!' badge
- Provide communication material to workplaces regarding the disruption early as well as platforms for sharing and showcasing ideas

- Work with workplaces to provide e-bike charging stations during the disruption period and build appetite for upcoming improvements in the cycling network
- Cycle skills and maintenance workshops

2.6 Other actions

There are a number of actions that will affect the success of the TBC package, but which are not strictly TBC activities. These items have been listed below:

- **Freight management and servicing** – The Port is located on the edge of a major disruption area (The Quays) and with goods, servicing and freight movements often competing in peak times to utilise the city centre transport network, there is a high potential for conflict with those travelling to the central city. A freight management plan is recommended for large and small freight movements and servicing as a reliable and efficient supply of goods and services to businesses and residents in the city is vital through and during disruption. Initiatives it could include are:
 - Consolidation of deliveries
 - Encourage the use smaller vehicles and human powered transport, particularly for distribution in urban areas
 - Change freight delivery times to reduce congestion
 - Improve vehicle operator training to encourage more efficient driving
- **Kerbside management** – particularly during disruption and where space is being reallocated for bus priority and dedicated cycle facilities, kerbside space will be a premium and will need to be strictly managed for uses such as temporary bus stops, bike and scooter share, shared mobility and taxi services and ride hailing pick up/ set down points.
 - Taxis-** In addition to identifying appropriate pick up and set down points, when taking EFTPOS or cash payments and providing receipts, taxis can take 2 minutes or longer to set down passengers, so the use of efficient payments via apps or allowing travellers to enter payment details while making their journey could save vital time (receipts could be emailed, card details could be loaded during the trip). LGWM might provide an opportunity to introduce taxi-sharing that would allow passengers to share rides and fares too, either via an app like Cabify or at places like the Airport, organising taxi ranks by destination to allow passengers to share.
- **Traffic Management Plans (TMP)** – these will seek to minimise the impacts of construction on transportation network users. Traffic management plans could also aim to create an integrated network of alternate routes and diversions to ensure individual TMPs work together to minimise any additional disruption. Consideration of temporary traffic management priority lanes for public transport and emergency services could also be explored.
- **Coordination between construction projects and the TBC workstream** - this includes communication specifically related to construction.
- **Provision of alternative routes for active travel users** - Construction teams should prioritise the safety and comfort of cyclists during construction by creating alternate routes. Smooth walking routes should also prioritise the safety and comfort of pedestrians including the visual and mobility impaired. These provisions should be communicated in a timely manner as part of the communications plan.

3 Mapping the disruption scenarios

While the LGWM programme and other transport network improvements will continue to improve capacity and reliability of the transport network, there will be localised disruption during its delivery where travel behavioural changes can reduce congestion.

The timeline below provides an indication of when the main disruption from LGWM and other construction projects is expected to occur and what will have been delivered before and will be delivered after/alongside each of the disruption scenarios being considered as part of this work.

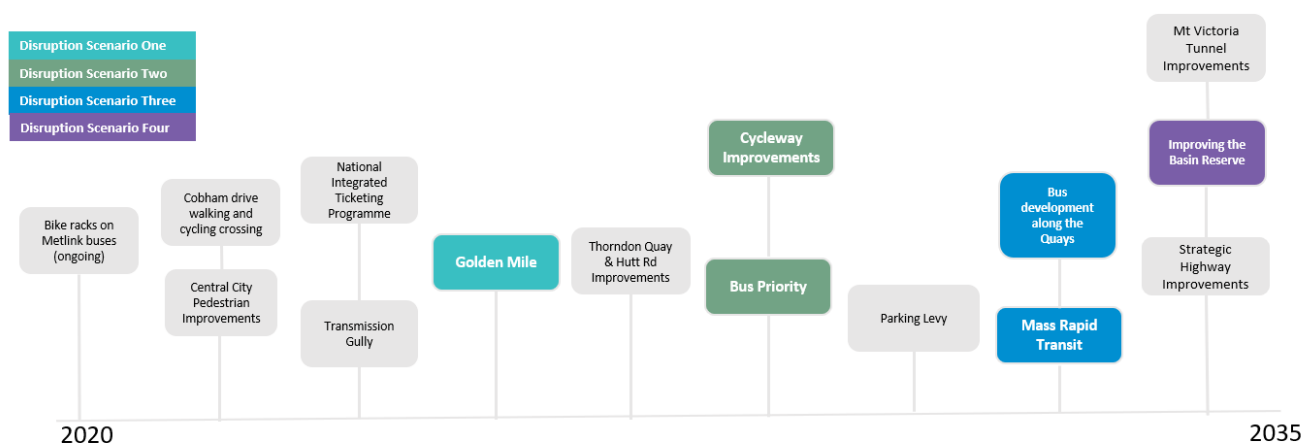


Figure 3-1 Indicative Timeline of construction events

Note: this timeline gives a general indication of when disruption may occur. As there is uncertainty around LGWM workstream timing and options this will change.

3.1 Who will be disrupted?

3.1.1 Travel to work

Appendix 2 – Disruption Scenario Impact Graphics broadly shows the origin and destination area for trips to work journeys to the city centre that will potentially be disrupted during each disruption scenario based on the 2018 census data. This data by no means is complete but it does provide a broad indication of the scale of impact on journeys to work in the city centre. There are other journeys to and through the city centre that are not shown in this data but will be disrupted as a result of construction related disruption.

Impacts on travel to work and other trips are discussed in relation to each scenario later in the report. Various information sources have been used to attempt to tell a story about the types of travel that may be disrupted in each of the scenario locations. Our knowledge of the travel in each of these areas is not perfect and complete. For example, Census data tells us the area of trip origin and destination, and travel mode, for self-reported Journey to Work and Journey to Education, however it does not tell us the route or time of travel. Count data provides an indication of mode of travel and volume at a particular site, but it does not give us route, origin and destination information, tell us about the traveller, or the trip purpose. Neither of these data sources provides us with information about how easily these trips may be changed. We have attempted to employ a wide range of data sources to get the most complete picture that we can and have also drawn on the local knowledge of our experienced team. However, we are aware that there may be travel patterns occurring within these places that we do not have complete information on.

4 Travel Behaviour Change strategies specific to each disruption scenario

4.1 Scenario 1: Golden Mile

The Golden Mile (Lambton Quay to Courtenay Place) is the heart of Wellington and has been classified as a key public transport route. The area is characterised predominantly by bars, clubs and restaurants on Courtenay Place, high rise offices, street level shops and cafes with some residential on Manners and Willis Street and high-rise offices with street shops and cafes on Lambton Quay. It is part of the last leg of many journeys, especially people travelling to the Wellington City Centre by bus or train.

Key improvements along the Golden Mile include dedicated bus lanes, improved walking and cycling environment in the central city, with lower CBD speed limits. The objective of 'Golden Mile and City Streets improvements' is to "make it better for people walking and on bikes and give buses more priority".

Disruption associated with the delivery of Golden Mile improvements will be concentrated in the central city including the main commercial street for Wellington as shown in Figure 4-1. Delivering these improvements will require the closure of some minor roads and result in construction related disruption and delays.

There will temporarily be less space and more crowding on the footpath when walking on the Golden Mile. There will be a net reduction in car parks during and after construction, access by private vehicles will also be restricted (some or all the times), side streets will be closed, and loading zones and taxi stands will be relocated to side streets.

At this stage, it is not clear which option may be selected, therefore precise impacts cannot be confirmed, however it is expected that improvements could be localised and be delivered progressively and gradually along the route, extending the duration.

Post-construction access will be heavily reduced for private vehicles and service vehicles will likely need to adapt to the new access restrictions.

4.1.1 What do we expect the wider transport system will look like at this point of this disruption?

The transport network will look very similar to today during the delivery of the Golden Mile improvements except for the construction of the Cobham Drive and Evans bay cycleways which will be complete. There are no other significant changes to the operation of the transport system expected before construction commences.

Transmission Gully Motorway will be open which could be expected to lead to a more intense traffic peak and congestion that takes longer to dissipate. The congestion will affect journey times for people who drive and for people travelling on buses between the Hutt and Wellington City or between Northern Suburbs and Wellington City.

These are the assumptions at the time of this report and may change.

When will the improvements be delivered?
 Could start in the 2021/22 financial year. While delivery could last for 1.5-2.5 years, it is expected that construction would be focused at localised sites progressing sequentially along the corridor.

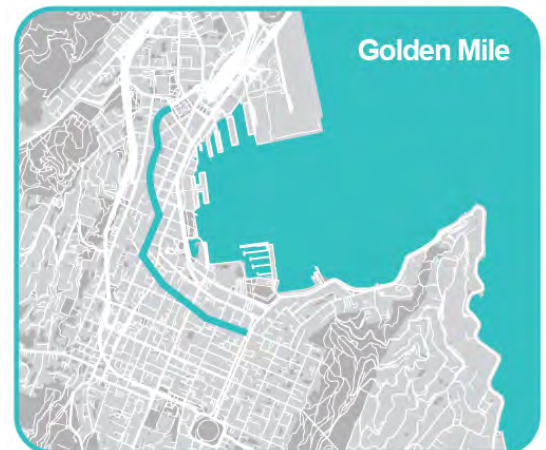


Figure 4-1 Map of area city associated with delivery of Golden Mile and City Streets improvements

4.1.2 Expected and perceived effects

It is expected that normal travel times will likely increase and become unpredictable due to disruption on the Golden Mile. Customer impacts have been depicted in Figure 4-2.

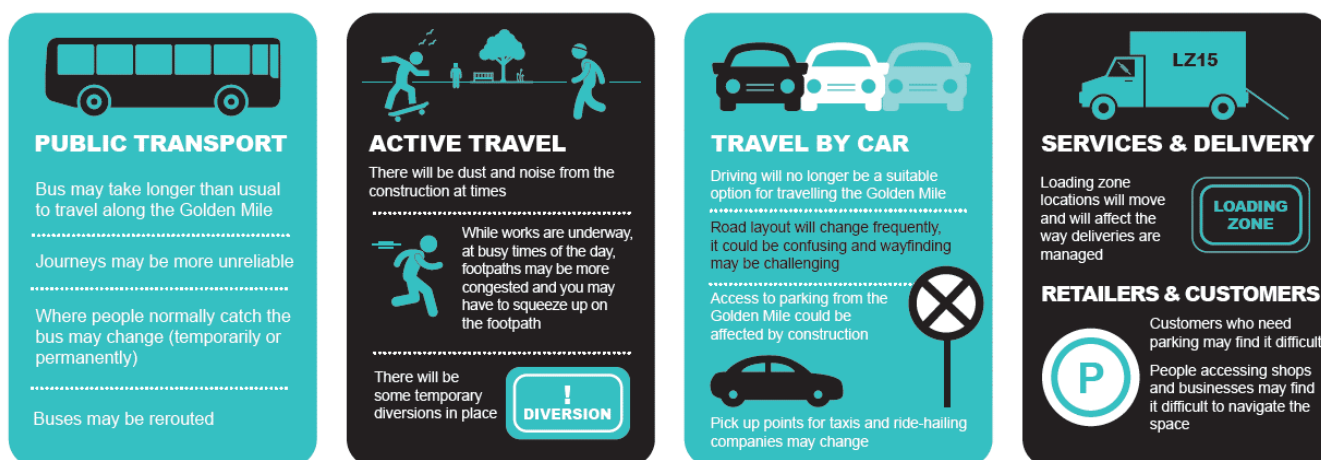


Figure 4-2 Customer impacts due to disruption scenario one

4.1.3 Who will be affected?

Disruption associated with improvements to the Golden Mile will affect businesses (in operation and business services) along the route; people accessing the Golden Mile by all modes; and people who live, work and play along the Golden Mile, especially on weekdays as it is less busy on weekends when workers are not in town, but those who are shopping on the weekend will also be impacted.

Key journeys that will be affected include:

- 36,000 people travel by bus along part of the Golden Mile every weekday. The 2016 Wellington CBD cordon survey identified 333 buses entering the Golden Mile between 7 AM to 9 AM, carrying just over 12,000 people. Most of the city's bus services are routed via the Golden Mile which means that any delays would impact people across the wider city. Bus travel along the Golden Mile includes people travelling through to elsewhere in the city or region (including Wellington International Airport (the Airport) or the Wellington Hospital (the Hospital)).
- Electronic ticket machine (EMT) data records bus boarding and alighting which indicates a spike in bus alighting between 7:30 AM and 9:30 AM, with the period between 8:15 AM to 8:30 AM being the busiest 15-minute time period with over 2,250 alighting. The PM peak is less pronounced, as commuters spread their travel home over a longer period between 4 PM–6:30 PM. The busiest boarding period is between 5 PM–5:15 PM when there are over 1,500 boarding.
- Commuters arriving in the city from the north using rail. The peak period for people exiting Wellington Station is between 8:10 AM–8:30 AM when over 4,000 people exit. In total, about 15,500 people arrive at Wellington Station in the AM peak (7 AM–9 AM). According to rail surveys undertaken in 2011, around 90% of people arriving by train walk to their final destination, with the remainder taking a bus. This means that about 13,950 of those arriving during the AM peak walk to their final destination, and the remaining 1,550 people use a bus.
- During and following construction there will be less road space for private vehicle traffic. Currently, around 6,500 people travel by private vehicle along part of the Golden Mile on a typical weekday. The Golden Mile also carries low volumes of traffic associated with building and business servicing (i.e. deliveries, maintenance, building work etc), with refuse collection and street cleaning occurring at night between midnight and 6am. There are in the order of 100 -

150 paid and time-limited car parks, plus loading bays and taxi ranks along Golden Mile that will also be affected during disruption.

- Around 31,000 people walk on part of the Golden Mile on a typical weekday and over 300 people cycle along part of the Golden Mile on a typical weekday who will be affected by construction related disruption.
- The Golden Mile improvements will also affect students traveling to schools located in the CBD or requiring travel through the CBD. Private schools (Scots College, Queen Margaret and Samuel Marsden Collegiate School) will be affected as students' bus or drive through the CBD to the suburbs. Wellington College (approx. 1800) will be affected as their catchment is in the northern and western suburbs and requires students to travel through the CBD to the Basin.

4.1.4 What other effects may people fear?

Some retailers, shoppers, and services may perceive that their parking and access is being reduced which may impact services. Businesses on the street may perceive construction as a disruption to their business. Others may perceive the increased pedestrian, cycling and public transport access to be positive for their staff, shoppers or business, as more people may be able to access the location. Workers may be worried that they are unable to get to work or it may require too much buffer time.

4.1.5 Travel behaviour change strategies for disruption scenarios

This disruption scenario will impact everyone travel travelling to and through the Golden Mile area, so a robust strategy is needed that will reach all users. Given the capacity constraints on the public transport network now and during disruption, the best way to travel through this area during disruption are classified as: using red (not suitable), amber (somewhat suitable) and green (preferred mode) in Figure 4-3.



Figure 4-3 Travel modes

The targeted strategies for this disruption scenario are outlined below:

People on buses - Maintain current patronage:

- Encouraging people to get off the bus one stop earlier and walk to avoid crowding at busy stops and to avoid being held up in traffic through and near construction sites
- Encourage active or micromobility for short trips instead of using the bus given the capacity constraints. Work with providers to provide subsidized shared micromobility trips when connecting to public transport.
- Communication about off-peak public transport fares. Metlink offers a 25% discount during off-peak hours when using the Snapper card for travel between 9am and 3pm and after 6.30pm weekdays, and all day on weekends and public holidays. (Appendix 4 – Off-Peak Travel Bus Fare in Wellington).
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie (refer to <https://www.wqtm.co.nz/getting-to-wynyard-quarter> for an example)

People using active travel - First choice for short trips:

- Communicate the need to allow more time for trips on foot during disruption. It will be important to also communicate how things will improve for people on foot and on bikes once the improvements are completed
- Run active travel competitions, challenges and incentives to encourage people to walk or use shared micromobility options for short trips even when capacity increases as the CBD is well suited to active modes. This is will also ensure capacity is maximised for people travelling longer distances
- Partner with shared micromobility providers so that customers can find good routes and drop zones are obvious
- Work with construction teams to embed a customer-centric approach to minimise disruption for people using active modes

People driving - Plan ahead, and drive only if you have to:

- Encourage people avoid driving to and through the city centre or plan ahead if they have to
- Communicate permanent net loss of parking and alternative parking options
- Leverage construction related disruption e.g. reduction in parking and reliability concerns to get people who drive to consider other modes by using incentives
- Construction worker travel plan to reduce driving and parking at construction sites. This could include initiatives such as park and ride outside of the city centre supported by shuttle services, lockers for tools avoiding the need to bring them to work every day and, encouraging carpooling or the use of shuttles.

Services & Delivery

- Consolidate deliveries
- Communicate new location of loading zones

Retailers and customers

- Communicate through business associations about potential disruption/delay to deliveries, permanent reduction in on-street parking and access issues.

Other strategies

- Map and signpost safe cycling routes during construction
- Improvements to Thorndon Quay and Hutt Road will have been made, there is an opportunity to promote cycling and micromobility uptake in these locations

4.2 Scenario 2: Linkages to the suburbs through bus priority lanes alongside cycle improvements, using Karori to the City as an example

This disruption scenario covers disruption associated with bus priority and cycle improvements, using Karori as an example, however strategies targeted for disruption related to bus priority development could apply in other locations. The route subject to improvements is a 6km-long transport corridor that connects the western suburbs to the central city. The area is characterised by predominantly residential and suburban centres with the area closer to town having older residential homes and denser uses near the city centre. Important destinations along the route include Parliament, the Botanic Gardens, Karori shopping centre, Marsden Village and Zealandia.

Improvements will include installation of bus priority, relocation of bus stop facilities, and dedicated cycle facilities connecting to the central city. This will improve the reliability of buses, and create dedicated cycling facilities and provide a multi-modal connection between the city and the western suburb of Karori (see Figure 4-4 for the location context).

Delivering these improvements will cause disruption during construction due to changes at intersections including the installation of bus queue jumps, relocation of bus stops along the route and construction of bus stop build outs to create in-line bus stops.

Physical works are likely to be delivered progressively along the route, section by section.

Following construction, there will be less road space for cars, however public transport will see significant improvements in services and priority, and cyclists will have dedicated on-street facilities or pathways. Golden Mile will also have been improved for these users.

4.2.1 What do we expect the wider transport system will look like at this point of this disruption?

It is planned that Early Delivery projects will be largely complete before delivery of the Karori to City corridor is started. It is assumed that the Golden Mile improvements will result in more reliable bus journeys through the central city, improved conditions for pedestrians and cyclists, and increased traffic flows on Featherston Street, on the Quays and on Wakefield Street (i.e. more congested than at present). The Thorndon Quay project will improve reliability for people on buses travelling between the central city and northern suburbs such as Ngaio, Khandallah, Johnsonville and Newlands and will improve safety and level of service for cyclists travelling between the central city and northern suburbs.

Transmission Gully Motorway will be open which will increase the morning peak hour traffic arrival rate at the Wellington Urban motorway between Ngauranga and Aotea. This could be expected to lead to a more intense traffic peak and congestion that takes longer to dissipate. The congestion

When will the improvements be delivered?
Delivery could be between 2021 and 2027 and last for 12 months. It is expected that construction would be focused at localised sites progressing sequentially along the corridor.



Figure 4-4 Scenario 2 - Disruption location context

will affect journey times for people who drive and for people travelling on buses between the Hutt and Wellington City or between Northern Suburbs and Wellington City.

These are the assumptions at the time of this report and may change. As timeframes are firmed up, LGWM should consider the sequence of delivery of the various workstreams to maximise the TBC opportunity and potential impact.

4.2.2 Expected and perceived effects

It is expected that during construction, there may be some increased delays for all road users due to disruption due to bus priority and improvements between Karori and the central city. Customer impacts have been depicted in Figure 4-5.



Figure 4-5 Customer impacts due to disruption scenario two

4.2.3 Who will be affected?

This disruption scenario explores the disruption impacts to travel en-route from the western suburbs, however it is important to note that many of these journeys will also be impacted by disruption along the Golden Mile.

During construction there may be some increased delays for all road users on the affected corridor, this delay would depend on the scale and nature of the construction, as well as the timing.

Traffic modelling shows that the route from Karori to the CBD is centred around the Karori Tunnel, meaning that people travelling from Karori via private vehicle, bus, or bike will generally always go through the tunnel, as detours can add a significant amount of travel time.

Key journeys that will be affected include:

- 2016 traffic modelling shows 2,517 vehicles head toward the CBD via the Karori tunnel in the morning peak (1130 return in the PM peak) who will experience delays and reliability issues
- In total, the Karori bus service (route #2) transports around 2,000 passengers heading towards the CBD during the AM peak. The 2016 Wellington CBD cordon survey identified that buses coming from Karori are generally quite full — 96% of all passengers were on a service where the seated volume to capacity ratio was greater than 85%, and 90% were on a service where the seated to volume ratio was greater than 100%. In addition, bus travel times from Karori take on average 5–10 minutes longer during peak times than off-peak times. This is likely to get worse during disruption and affect reliability of journeys to and from (and through) the city centre.

- 234 cyclists travel through the Karori tunnel toward the city centre on an average weekday, and 79 on the average weekend (257 and 89 respectively were counted headed in the other direction, perhaps indicating the use of other routes or off-road cycle trails for the downhill trip leg).
- Karori bus improvements will also affect people traveling to and from school, primarily students coming in to Karori to private school Samuel Marsden Collegiate School (approx. 500). Also affected are students residing in Karori traveling to Wellington College and Wellington Girls College, the largest boys and girls state school in Wellington city respectively.
- It is also worth noting that Victoria University has two campuses to the west of the city centre (one in Kelburn and one in Karori), so disruption within this area may impact travel to and from these locations for trips with education and work purposes.

4.2.4 What other effects may people fear?

People who drive may fear that their travel time will be longer or less reliable, or that car access may be reduced. People who travel by bus or cycling may be concerned about increased journey times and may shift to driving. Workers may be worried that they are unable to get to work or it may require too much buffer time.

4.2.5 Travel behaviour change strategies for disruption scenarios

This disruption scenario will impact everyone travelling from the west and some from the northern suburbs will be impacted the most. The best way to travel through this area during disruption are classified as using red (not suitable), amber (somewhat suitable) and green (preferred mode) in Figure 4-6.



Figure 4-6 Travel modes

The targeted strategies for this disruption scenario are outlined below:

People on buses (for this scenario and other bus priority development) - Encourage travel by public transport at less busy times for a more comfortable journey:

- Communicate off-peak public transport fares (9am - 3pm and after 6.30pm) to encourage peak spreading as buses are at or near capacity during peak travel times.
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie, also provide this information at bus stops and make sure wayfinding is clear for any changes (temporary or otherwise) e.g. 'this bus stop is no longer in use/ temporarily closed', 'this way (directional arrow, xx metres/ 1 minute walk) to the new bus stop location'
- Communicate that people need to allow for extra time to get to work and school while works are underway as buses may be delayed, particularly during peak times
- Community events to get people to give public transport a go (message to also come through employers and workplace travel plans) ahead of disruption

People using active travel - This disruption is temporary, get ready for better facilities:

- Encourage people to walk or cycle for short, local trips

- Run active travel competitions, community events and incentives to encourage participation in car free days and walk/bus/bike to workdays
- Work with construction teams to embed a customer-centric approach that minimises disruption for people using active modes. This will be particularly important during construction of the bus priority lanes and bus stop improvements as kerbside construction will interfere with the space for people who cycle.
- Create and communicate safe (smooth) alternative routes that cyclists or scooter users can travel on to avoid the construction area. This will help deter people who bike and scoot from shifting to driving due to potential safety concerns on their current route.
- Bike maintenance and skills training to encourage uptake (also scooter training perhaps via scooter share providers)

People driving – Plan ahead, share that ride and drive only if you have to:

- Encourage people driving, taking a taxi or relying on a ride hail service to plan ahead as road space will be reduced during construction
- Communicate alternative routes, travel times and disruption-related delays through journey planning and navigation apps (allow people to sign up for route or area specific information-send updates via push notifications). Having up to date travel information may encourage people who drive to use other modes of travel.
- Encourage carpooling and ridesharing during and after disruption to minimise the number of cars moving through areas of disruption
- Work with the construction team and advocacy groups to make sure temporary and permanent changes to mobility parks are obvious and well communicated

Businesses and residents

- Communicate through business associations about potential delays for deliveries, access issues and loss of on-street parking. This will ensure businesses are informed and they can proactively communicate with their customers.
- Provide information about delays or disruptions ahead of time or as they're happening
- Promote, sponsor, establish and share details of existing co-working spaces in or near Karori that workers could access instead of travelling into town. This service will support people who can work flexibly but prefer an allocated workspace.
- Flexible working toolkit for employers

Other strategies

- Prepare people for decreased space for cars and impacts to parking in Karori and the city centre. Ensuring driver in particular recognise that the changes during disruption will result in reduced road allocation for drivers may trigger people to consider travelling differently.
- Work with education providers and businesses offering services that customers or visitors' access to plan their timetables around the disruption. Later or staggered start times could reduce peak travel time traffic.
- Health services providers might offer virtual appointments or re-plan opening hours temporarily
- Community events to get people to give public transport a go (message to also come through employers and workplace travel plans) as disruption is wrapping up to encourage people to consider shifting the way they travel as bus facilities and service improves.

- Bike maintenance and skills training to encourage uptake (also scooter training perhaps via scooter share providers)

4.3 Scenario 3: Network disruption MRT / bus development of the Quays

Delivery of Mass Rapid Transit (MRT) along this predominantly traffic route, will result in the creation of a second public transport spine through and past the central city. The objective of this work is to create a new mass transit route connecting the Railway Station with Newtown and the eastern suburbs that moves more people, goods and services reliably, with fewer vehicles, see Figure 4-7 for the location context. Depending on the timing of City Streets and MRT developments, timing and the level of this disruption could vary. At this stage it is possible that a second PT spine down the Quays might be developed before an MRT option and would be in the first tranche of the City Streets projects. This would see some disruption but not to the same extent as an MRT option.

Delivery of MRT will involve allocating road space for the public transport use only and construction of new BRT stations and platforms. Depending on the option selected, it could involve relocation of buried services and road.

When will the improvements be delivered? The delivery of MRT may commence soon after 2028 and could take several years to complete.



Figure 4-7 Scenario 3 - Disruption location context

This will disrupt travel, may cause traffic delays that have the potential to impact up and downstream parts of the quays as well as surrounding road networks.

Following construction, traveling by bus and active modes will be quicker, more enjoyable and attractive. Extensive bus infrastructure improvements will be in place including bus lanes and intersection reconfiguration for priority. There will be high frequency services (every 10 minutes or less); modern, high capacity electric vehicles with superior ride quality; fast loading and unloading; dedicated lanes with signal priority; and high-quality stations with level boarding. Mass transit will improve travel choice through the city with attractive public transport on a second spine along the waterfront quays and will help shape a more compact and sustainable city and region.

The Quays will see improved public transport (buses), an improved street environment, including crossings, changes to parking and the volume of traffic and the speed of vehicles will reduce. Traveling by bus will be a faster and more reliable choice for people travelling to and through the central city.

4.3.1 What do we expect the wider transport system will look like at this point of this disruption?

It is assumed that the following changes will have been delivered:

- Hutt Road / Thorndon Quay
- Golden Mile
- Cycleways (Eastern Suburbs to City, and possibly Karori to City, Johnsonville/Newlands to City, Brooklyn to City, Island Bay to City depending on timing); and
- Transmission Gully will have been delivered.

These are the assumptions at the time of this report and may change. Relative timing has the potential to change the scale of the impact, which supports a TBC approach across the LGWM

programme. LGWM should consider the sequence of delivery of the various workstreams to maximise the TBC opportunity and potential impact.

4.3.2 Expected and perceived effects

It is expected that driving is not the best way to travel through this area during disruption and customers should use alternatives. Customer impacts have been depicted in Figure 4-8.

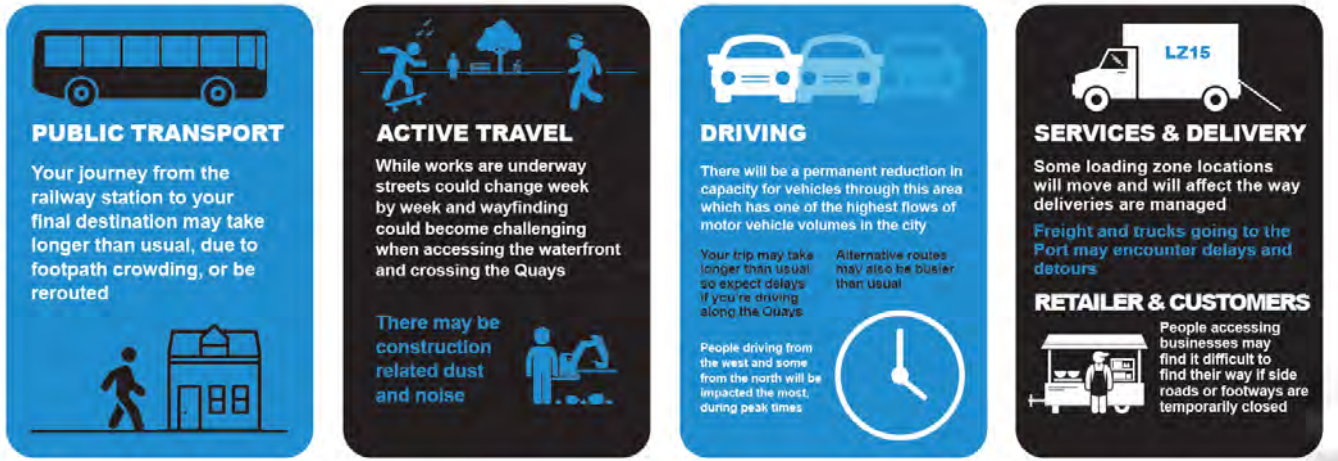


Figure 4-8 Customer impacts due to disruption scenario three

4.3.3 Who will be affected?

The waterfront Quays a major traffic route and vehicle traffic is consistently high along the quays during the AM and PM peaks as well as during the interpeak period. Buses do not use the waterfront Quays between the train station and Oriental Bay. Just under 4,000 people in private vehicles enter the CBD from Aotea Quay / Waterloo Quay during the AM peak (Wellington CBD cordon survey 2016). This represents one of the highest flows of motor vehicle volumes in the city, which means that many people in cars could be affected by disruption along this route.

Overall, this route is not a primary thoroughfare for pedestrians or cyclists, except for people crossing the Quays on foot and by bike to access the city/waterfront, and along the northern section to walk to and from the train station. It is also not part of the proposed future central city cycle network. Scheduled bus services do not regularly operate along the quays except during planned and unplanned events.

Key journeys impacted may include:

- People commuting between city & region, intra-city travel, access to Oriental Bay area, travel to or through the city from the north and people using the Quays as an alternative route to SH1 to access the Airport
- The waterfront Quays are a major road connection between the Aotea Quay off-ramp from SH1 and the central city area. The Northern end provides access to the port area, the Wellington Rail Station, freight and passenger ferries to the South Island, and the passenger ferry service to Seatoun, Matiu/Somes Island & Eastbourne
- The waterfront Quays lie between the city centre and the waterfront area. Along the quays are major attractions such as Te Papa and other museums and galleries, theatre, civic and events centres, as well as weekend markets and a major supermarket

- Heavy commercial vehicles (trucks) were counted along Aotea Quay in 2016. The count identified a peak truck flow of 70 trucks per 15 minutes. This is significantly higher than other locations where truck counts took place and is largely due to port traffic using the Quays
- At the other end of the route connecting to Newtown, MRT (or possibly further bus priority construction) is likely to affect Riddiford Street, Adelaide Road and the wider street network, affecting traffic from the city to and from South Wellington, and access to the Hospital. It will need to be integrated with facilities for cyclists and will affect road users to and from the southern suburbs (including public transport)
- People accessing the cross-channel ferries (Bluebridge, InterIslander and CentrePort) may be impacted by delays on the Quays.
- Motorists driving from Karori to the northern part of the city will often use part of the Quays and vehicle traffic is consistently high along the Quays during the AM and PM peaks and interpeak period, with observed vehicle counts taken at Waterloo Quay reaching 4,400 over the two-hour PM peak period. The quays provide a secondary route through Wellington's CBD (the main route being SH1). If general traffic diverts to other routes to avoid the Waterfront Quays, this could result in congestion and delays to alternative routes within the city centre.
- Reduced capacity for vehicles down Customhouse and Jervois Quays will have significant impacts not only on the traffic from the Aotea Quay SH1 off-ramp, but also to and from Hutt Road towards Aotea Quay, Bowen and Whitmore Streets. People who drive will encounter disruption on primary routes as well as alternate routes, adding further congestion in the central city.
- Pedestrian use of the Quays is limited near the port end but picks up nearer Wellington Station. About 600 people were observed crossing the CBD cordon during the AM peak (Wellington CBD cordon survey 2016).
- Journey to work trips for people cycling from the eastern suburbs could be affected because they often cross the Quays to access the city. This is similar for people walking.
- The space around the waterfront is used for recreational and leisure purposes. Disruption on the Quays may make it harder for people who are walking or cycling to get across the road and access the Waterfront, although if traffic volumes reduce during construction, it could also be easier.
- MRT and bus development on the Quays will also affect travel to and from schools, specifically students traveling from northern and western suburbs in to, or across the CBD. This will primarily be Wellington College, Scots College and St Patricks College. Also affected will be students travelling from the east and west to Wellington Girls, St Marys and Queen Margaret College.

4.3.4 What other effects may people fear?

There are very few businesses which front onto the Quays and the route is not congested most of the time. Some members of the public may be concerned that MRT along this route would continue to sever the waterfront from the city. Workers may be worried that they are unable to get to work or it may require too much buffer time.

4.3.5 Travel behaviour change strategies for disruption scenarios

In the western and northern direction, these disruptions will have implications on travel demand due to the likely spreading of traffic flows from commuters as well as the future of public and active transport as the appeal of driving and parking will reduce. This will also influence the ratio of the public who will work from home and how they schedule their commute when they venture towards the city.

The best way to travel through this area during disruption are classified as using red (not suitable), amber (somewhat suitable) and green (preferred mode) in Figure 4-9.



Figure 4-9 Travel modes

The targeted strategies for this disruption scenario are outlined below:

People on buses – Best choice for long trips:

- Provide up-to-date information via journey planning and MaaS tools to ensure customers are aware of where disruption is occurring, when and how to plan ahead.
- Work with Metlink to ensure events during disruption are prioritised for free fares, and ensure events advertise if they qualify for the free Metlink fares for events. This will increase the appeal of using the bus to attend evening and weekend events along the waterfront, particularly those who live in the northern suburbs, Porirua and Kapiti Coast, and Hutt Valley and Wairarapa.

People using active travel - Best choice for short trips:

- Work with construction teams to embed a customer-centric approach that minimises disruption for people using active modes. Preserving active travel connectivity during disruption will maintain or possibly increase use during disruption, particularly those cycling in from the central Wellington, eastern and western suburbs.
- Communicate changes and alternative routes to access the rail station. Those travelling by rail from the western and northern suburbs, Porirua and Kapiti Coast, and Hutt Valley and Wairarapa to the train station should be encouraged to use active travel for first and last legs, however they will need to be prepared to encounter disruption from the train station to their final destination and return trip.

People driving - Plan ahead, and use alternatives where possible:

- Work with construction companies to manage the number of vehicles used to commute to construction sites. This will minimise the effect of disruption on the central city but may not affect disruption on the Quays themselves.
- Work with the construction team to make sure temporary and permanent changes to mobility parks are obvious and well communicated
- Encourage people to plan ahead for trips to the ferry terminals as they may encounter delays and detours.

Services and delivery

- Communicate with freight and courier companies to keep them informed of route changes or delays via journey planning apps or EROADS
- Consolidate deliveries and co-ordinate pick up/ drop off

Retailer and customers

- Communicate through business associations and other networks about potential disruption, loss of on-street parking and any access issues

Other strategies

- Work with bikeshare and scooter share providers, rebalancing to meet people's needs (day to day and for events)
- Messaging around recreational travel on evenings, weekends, and summer to access Oriental Bay: use the cycleway/waterfront. Could potentially communicate different messages for utility trips versus recreational trips.
- Encourage 'Make a family adventure out of it' family recreational cycling trips supported by park and ride for trips into the city on weekends
- Travel plans for Te Papa, events at the waterfront, Farmers Market and Events Centre to minimise traffic during PM peak times and weekends

4.4 Scenario 4: Basin Reserve Grade Separation

The Basin Reserve is a historic cricket ground within a small traffic gyratory with 3/4 circulatory traffic lanes. The construction associated with Basin Reserve grade separation will create disruption as there will be construction directly within the transport corridor, occupying at least 50% of the existing transport corridor at any one time in the area in Figure 4-10.

Access to schools, adjacent properties and through to Wellington Hospital and International Airport will be maintained.

It is likely that during construction traffic will voluntarily divert to the adjacent transport network, with some routes eg Tasman Street and Oriental Parade experiencing an increase in traffic volumes. Limited alternate routes to the Basin will result in Wallace and Taranaki Streets being congested which will affect people on buses and people on bikes on Oriental Parade.

The construction works will involve:

- Grade separation at the Basin. This could include lowering the level of some sections of the SH1 Northbound to enable local roads to provide for north-south movements by buses, peds and cycles and potentially MRT to pass over the top
- Deep excavations and is likely to involve moving SH1 Northbound and local roads onto a temporary alignment
- Multiple staging which would mean that road layouts could be expected to regularly change (every few months); and
- Temporary road alignments and speed limits are likely to cause delays and unreliable journeys. It is assumed that an additional lane would need to be acquired by reducing space for traffic on the existing corridor, at least temporarily to provide space to construct the changes as well as allowing movement

Post-construction, the grade-separation of N-S and E-W traffic would enable the MRT to connect to the Hospital and reduce conflict with traffic on SH1 E-W, including trips to the Airport. This will also improve walking and cycling access from the South of the city with the city centre.

When will the improvements be delivered?

The delivery of the changes at the Basin reserve are unlikely to start before 2028. It is possible that the delivery of grade separation at the Basin reserve may take 2 - 3 years.



Figure 4-10 Scenario 4 - Disruption location context (Basin Reserve area)

4.4.1 What do we expect the wider transport system will look like at this point of this disruption?

It is assumed that the following changes will have been delivered:

- Hutt Road / Thorndon Quay
- Golden Mile
- Cycleways (depending on timing, could include Karori to City, Johnsonville/Newlands to City, Brooklyn to City, Island Bay to City, Eastern Suburbs to City); and
- Transmission Gully will have been delivered.

These are the assumptions at the time of this report and may change.

4.4.2 Expected and perceived effects

It is expected normal travel time will likely increase, potentially in an unpredictable way due to disruption around the Basin Reserve. Customer impacts have been depicted in Figure 4-11.



Figure 4-11 Customer impacts due to disruption scenario four

4.4.3 Who will be affected?

Many trips through the city converge at the Basin Reserve which means impacts will be widespread. Appendix 3 – Traffic Through Intersections in the CBD demonstrates the number of people passing through the Basin Reserve (see bottom of image) during AM peak and inter-peak, which is similar for PM peak and weekend, with more vehicles over the weekend. Routes through the Basin Reserve provide a key link to the Wellington Regional Hospital and Wellington International Airport. A 2011 survey identified that about 40% of all journeys to and from the airport occur by private car, just over half occur by taxi, and about 5% occur by public transport.

A number of schools will also be impacted including Wellington College (Boys) and Wellington East Girls College, Wellington High School and Massey University. Students at Wellington East Girls college will be travelling from the south and eastern suburbs. Wellington College (Boys) students will be travelling from the central and western suburbs. Wellington High school (mixed) and Massey University catchment is wider.

Key journeys that will be impacted include:

- The Basin Reserve is one of the major north-south, east-west intersections in Wellington city, with the east-west route being SH1 and connecting the wider region with the Airport and Hospital via the city centre.
- There are three main approaches to the Basin Reserve: Adelaide Road from the south, SH1 Paterson Street / Mount Victoria Tunnel from the east, and SH1 Kent Terrace from the north will be impacted.
- Analysis of 2018 major JTW destinations in Wellington city concluded that 2,319 work trips to the hospital and 1,674 work trips to the airport could be impacted, of which 64% and 82% are by car respectively
- Traffic counts undertaken in 2016 show that approximately 1,900 vehicles travel along Adelaide Road toward the Basin Reserve during the AM peak (7 AM–9 AM), a figure which is consistent during the interpeak (12 PM–2 PM) and the peak period (4 PM–6 PM). Traffic away from the Basin Reserve down Adelaide Road during the AM peak is 1,200 vehicles, 1,400 during the interpeak, and 1,300 during the PM peak.
- Traffic counts for Mt Victoria tunnel show that during the AM peak and interpeak periods 2,500 vehicles travelled eastbound through the tunnel and 2,900 vehicles travelled this route during the PM peak. Kent and Cambridge Terraces (South of Vivian Street) traffic counts indicate high volumes, particularly southbound with 3,900 vehicles passing through this area during both AM and PM peaks and 3,800 interpeak. Northbound volumes are much lower with 1,300 vehicles travelling through this area during AM peak, 1,400 interpeak and 1,400 PM peak.
- Some bus routes avoid the Basin Reserve area and connect with the Eastern suburbs and the Airport via Oriental Bay, Mount Victoria, or the dedicated bus tunnel connecting Mount Victoria to Hataitai, or they connect with the southern suburbs via Taranaki & Wallace Streets.
- Other bus routes travelling to the Hospital and the southern and eastern suburbs currently travel via the Basin Reserve.
- Bus passenger numbers from a 2013 report around the Basin Reserve indicate by 2021 southbound passengers from Kent Tce, Ellice St, Dufferin St (N of Paterson), Dufferin St (S of Paterson), Rugby St and Adelaide Rd will be approximately 4,100 people during AM peak and over 10,400 during PM peak. Northbound bus trips along Adelaide Rd, Rugby St, Sussex St, Sussex St (N side of Basin Reserve), and Cambridge Tce will carry over 11,400 people during AM peak and over 3,500 during PM peak.
- Pedestrian data from 2016 shows that there is a pedestrian AM peak along Adelaide Road between 8 AM–9 AM due to the nearby schools. A corresponding PM peak is assumed between 2 PM–3:30 PM, though this was not observed as it was outside the standard peak/interpeak windows.
- Disruption at the Basin will also affect travel to and from school, particularly students traveling to Wellington College, Wellington East Girls College and St Mark's school (combined school roll of approx. 3000). Wellington College is located next to the Basin Reserve (eastern side) and its catchment is central, western and northern suburbs. Students traveling to private school Scots College in the eastern suburbs (approx. 850) will also be affected.

4.4.4 What other effects may people fear?

It is likely the common adverse effects from construction such as traffic, congestion and delays, would be most feared. Workers may be worried that they are unable to get to work or it may require too much buffer time.

4.4.5 Travel behaviour change strategies for disruption scenarios

In the eastern and southern direction, these disruptions will have implications on travel demand as the appeal of driving and parking will reduce. This will also influence the ratio of the public who will

work from home and how they schedule their commute when they venture towards the city. The best way to travel through this area during disruption are classified as using red (not suitable), amber (somewhat suitable) and green (preferred mode) in Figure 4-12.



Figure 4-12 Travel modes

The targeted strategies for this disruption scenario are outlined below:

People on buses - Encourage off peak travel on buses, communicate the need to allow more time for a trip to the Hospital or Airport on services affected by delays:

- Work with Metlink to ensure events during disruption are prioritised for free fares, ensure events advertise if they qualify for the free Metlink fares for events
- Communicate with schools in advance so parents can plan ahead for students to catch an earlier bus
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie

People using active travel - Take alternative routes where possible:

- Designate an off-site drop off area that allows students to walk into the school and will reduce congestion
- Work with construction teams to embed a customer-centric approach that minimises disruption for people using active modes
- Encourage people to walk or cycle for short, local trips
- Run active travel competitions, community events and incentives to encourage participation in car free days and walk/bus/bike to workdays
- Make it easier for people to walk or cycle to the Airport from surrounding suburbs

People driving - Only drive through this area if necessary, emphasise the need to allow more time to get to the Hospital or Airport:

- Designate an off-site drop off area that allows students to walk into the school to reduce local congestion
- Communicate that driving trips through the Basin Reserve to the Airport and Hospital will be delayed
- Encourage the use of airport park and rides as an alternative to parking at the Airport

Hospital and Airport travellers (all modes) - Communicate the need to allow more time for a trip to the Hospital or Airport:

- Work with the Hospital and Airport to help patients or travellers to plan their trip (understand travel options, how much extra time to allow, best times to travel)
- Use various media channels & journey planning/ MaaS apps to get messages out about delays & the best travel choices

- Work with the Airport and Hospital to support people who arrive early or late (comfortable waiting; flexible scheduling where possible; contingency for late arrivals)
- Improve end-of-trip facilities for bicycles and e-bikes at the Airport and Hospital
- Encourage the Airport to consider luggage logistics and remote check in options to give people more freedom with their travel choices (it's easier to bike, walk or take the bus if you're not wheeling luggage)

Businesses, services and delivery, retailers

- Communicate through business associations about potential disruption/delays to deliveries, loss of on-street parking and access issues
- Develop a Freight Management Programme which will include loading and delivery timing/schedules.

Other strategies

- Encourage schools in the area to consider staggered start times e.g. 9:30am start with 4:00pm finish to avoid conflict with commuters
- Travel plans for events at the Basin Reserve
- Coordinate messaging of disruption through schools with travel plans to notify parents in advance, work with Airport and Hospital on early and consistent messaging, plan before you go
- Coordinated messaging of disruption through Airport Travel Plan - plan before you go, comms from the Airport and cover all modes of travel that might be affected.

5 Next steps

This report has presented information about where four disruption scenarios will occur in the city as a result of LGWM's infrastructure projects. It has examined the scale of disruption by looking at how many people will be affected and identifying key user groups travelling to each area, and it has considered the main impacts on customers of the transport system. TBC approaches common to all scenarios have been suggested and the four scenarios have also been considered separately with TBC strategies developed for each. Data and approaches for each scenario have been summarised and presented in the form of four 1-page A3 Infographics (see Appendix 5 – Disruption Scenario Infographics).

Targeted strategies have been created for each disruption with the intent to actively manage demand, leverage disruption and achieve long-term travel behaviour change. The approaches recommended in this report draw from successful approaches elsewhere, considered TBC that is already in place and the Wellington context. A collaborative approach involving organisations and influencers will be key to their success.

The next steps for Let's Get Wellington Moving will be to develop the strategies into a TBC action plan that covers all disruption scenarios that LGWM will bring, building on the strategies developed by this work. Early tasks would be to engage with organisations that have travel plans and to establish a group that could grow to become a TMA. Working with the Airport, the Hospital, employers and education providers will be key to a successful campaign as will working with Kaumātua - Māori elders - and bringing key influencers from the community on board.

Disruption is a trigger for behaviour change, so it makes sense to use the construction to persuade people to make different choices about their travel. Similar campaigns have resulted in sustained behaviour change that has outlasted construction events, and this should happen in Wellington too, particularly because the level of service for those using active transport and shared modes will improve after LGWM has completed its work. Where delays cannot be avoided, providing information and advising why construction will take place can minimise stress for those affected, but by shifting travel times, mode choice or reducing the need to make a trip can reduce the overall impact of the disruption.

References

- Aimsum. (2016). *Select Link Analysis Transport Modelling for Disruption Scenarios*. Wellington.
- Auckland Transport (2020) *Reduce traffic congestion and keep Auckland moving*. Accessed 5 November 2020. <https://at.govt.nz/about-us/campaigns/spread-the-jam/>
- Carnyx Group Ltd (2020) *Transport for London launches new campaign to ease Olympic travel chaos*. Accessed 5 November 2020. <https://www.thedrum.com/news/2012/04/19/transport-london-launches-new-campaign-ease-olympic-travel-chaos>
- Ford, A, C Gerds and S Prosee (2017) *Let's Get Wellington Moving – Data Report*. Accessed 5 November 2020. <https://getwellymoving.co.nz/assets/Uploads/LGWM-Data-Report.pdf>
- Greater Wellington Regional Council (2020) *Off-peak travel*. Accessed 5 November 2020. <https://www.metlink.org.nz/tickets-and-fares/off-peak-travel/>
- ianVisits (2012) *How TfL is planning for the Olympics traffic deluge*. Accessed 5 November 2020. <https://www.ianvisits.co.uk/blog/2012/03/07/how-tfl-is-planning-for-the-olympics-traffic-deluge/>
- idNZ (2018) *Wellington City – Community Profile*. Accessed 5 November 2020. <https://profile.idnz.co.nz/wellington/languages#:~:text=Overall%2C%2071.5%25%20spoke%20English%20only,speaking%20this%20language%20at%20home.>
- Nicholls, A (2017) *LGWM – initial indication of construction disruption*. Accessed 5 November 2020. <https://lgwm.nz/assets/Uploads/LGWM-Construction-Disruption.pdf>
- WellingtonNZ (2020) *Coworking spaces*. Accessed 5 November 2020. <https://www.wellingtonnz.com/work/co-working-spaces-around-wellington/>
- Wynyard Quarter Transport Management Association (n.d.) *Getting to Wynyard Quarter by bus*. Accessed 5 November 2020. <https://www.wqtma.co.Qnz/getting-to-wynyard-quarter>
- The World Bank Group (2018) *Smart Commute Initiative (Toronto – Canada)*. Accessed 5 November 2020. <http://icities4greengrowth.in/casestudy/smart-commute-initiative-toronto-canada>
- Transport for NSW (2018) *Interactive map*. Accessed 5 November 2020. <https://www.mysydney.nsw.gov.au/interactive-map>
- WSP. (2013). *Basin Bridge Project: Technical Report 4 Assessment of Traffic and Transportation Effects*. Wellington: WSP.

Appendix 1 – Communication Tools

Communicating directly with the public

- ‘Get Ahead of the Games’ campaign to communicate directly with Londoners, commuters and people right across the UK
- Information, tips and advice via ads, posters, emails and a new website and Twitter and You Tube channels
- Will explain how those who live and work in travel hotspots can:
 - Reduce
 - Reroute
 - Retime
 - Remode



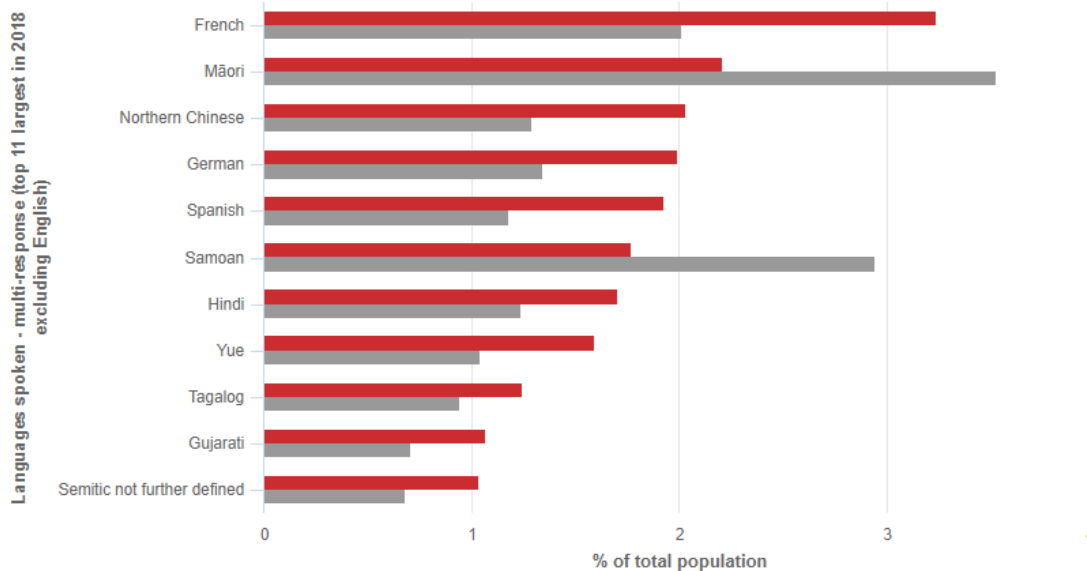
www.getaheadofthegames.com

Transport for London Olympics Travel advice (ianVisits 2020)

Languages spoken, 2018

export

Wellington City Wellington Region

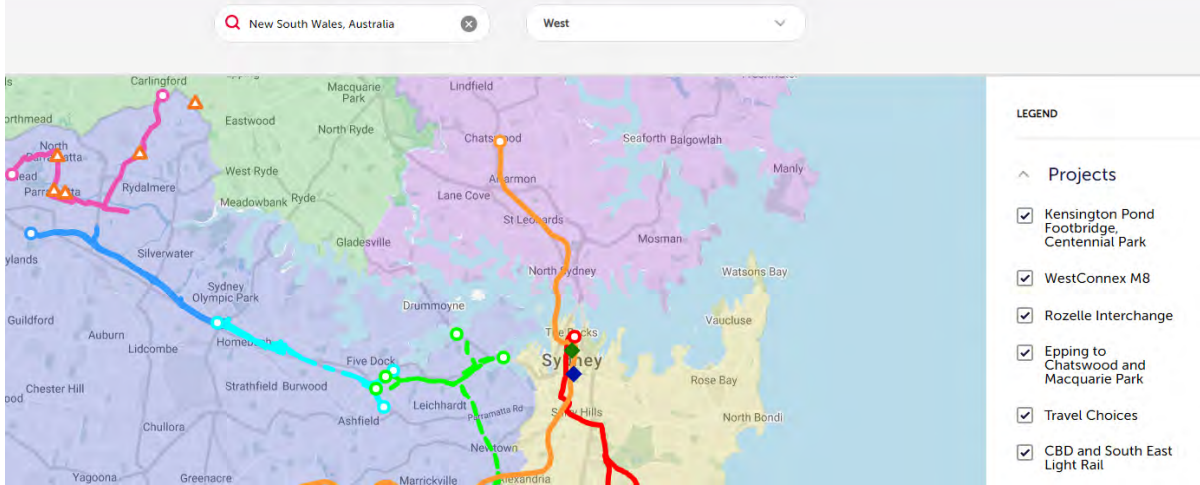


Source: Statistics New Zealand, Census of Population and Dwellings, 2018. Compiled and presented by .id, the population experts.

Languages spoken in Wellington City and the Region (idNZ 2018)

INTERACTIVE MAP

From new light rail and a new metro railway, to better road connections and train station upgrades, we're improving transport infrastructure across Sydney.



Interactive map, Sydney Travel Choices (TNSW 2018)



Snapshot of communication platforms/messaging used by Sydney's Travel Choices

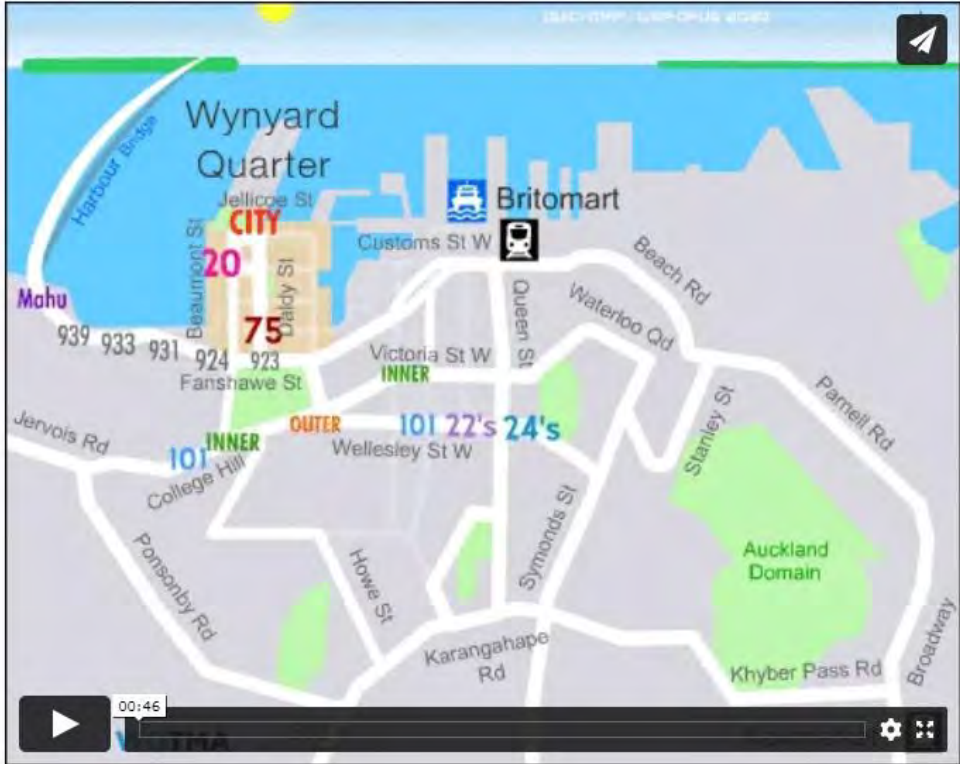


Social media communications examples from Auckland Transport



Communications from Transport for London (CG 2020)

GETTING TO WYNYARD QUARTER BY BUS



Wynyard Quarter TMA bus map movie example <https://www.wqtma.co.nz/getting-to-wynyard-quarter>

Appendix 2 – Disruption Scenario Impact Graphics

Disruption Scenario 1:

Golden Mile

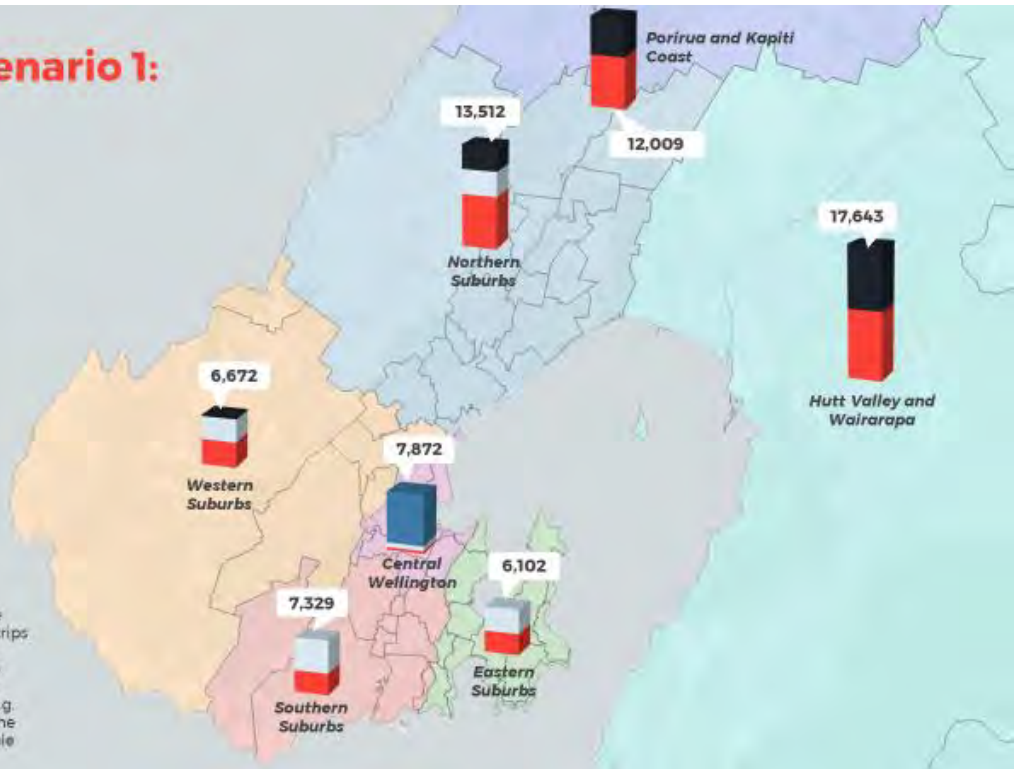
Legend

Mode and size

Total number of people impacted



This map depicts potential impact of the disruption scenarios on journey to work trips into the city centre that may be directly impacted. It assumes all trips from these areas will be impacted in some way and excludes trips through the city centre - e.g. trips from the region to the airport and the hospital. It also does not reflect all possible modes.



Disruption Scenario 2:

Delivering bus priority and improvements for people on bikes between Karori and the central city

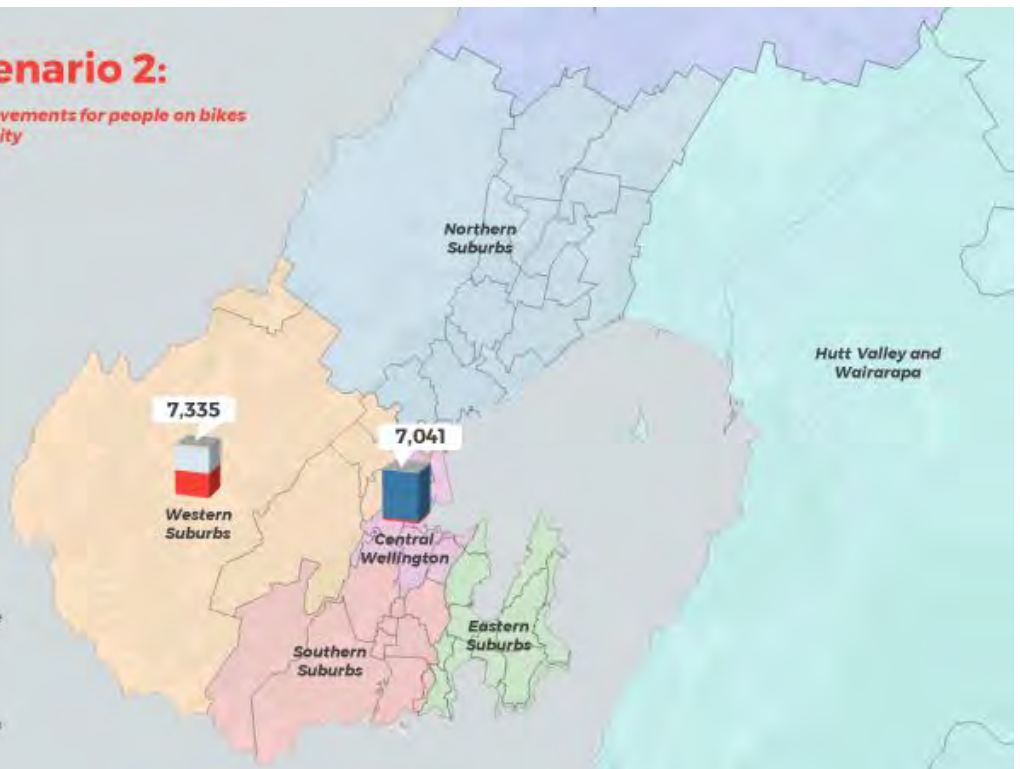
Legend

Mode and size

Total number of people impacted



This map depicts potential impact of the disruption scenarios on journey to work trips into the city centre that may be directly impacted. It assumes all trips from these areas will be impacted in some way and excludes trips through the city centre - e.g. trips from the region to the airport and the hospital. It also does not reflect all possible modes.

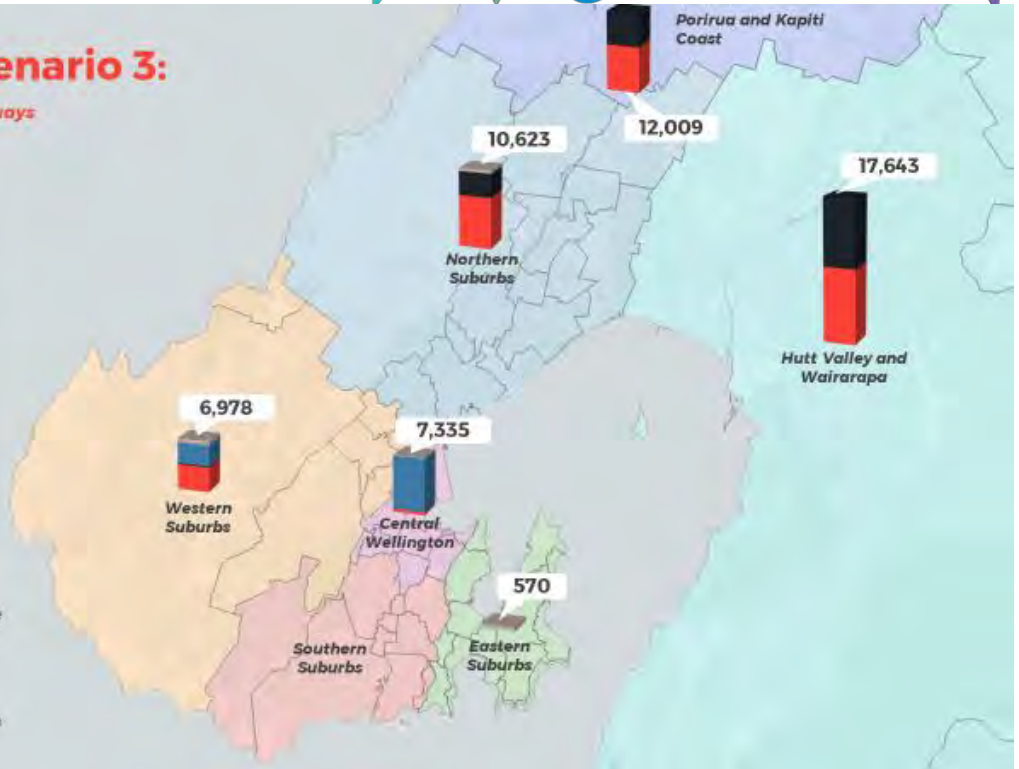


Disruption Scenario 3:

MRT / bus development on the Quays



This map depicts potential impact of the disruption scenarios on journey to work trips into the city centre that may be directly impacted. It assumes all trips from these areas will be impacted in some way and excludes trips through the city centre - e.g. trips from the region to the airport and the hospital. It also does not reflect all possible modes.

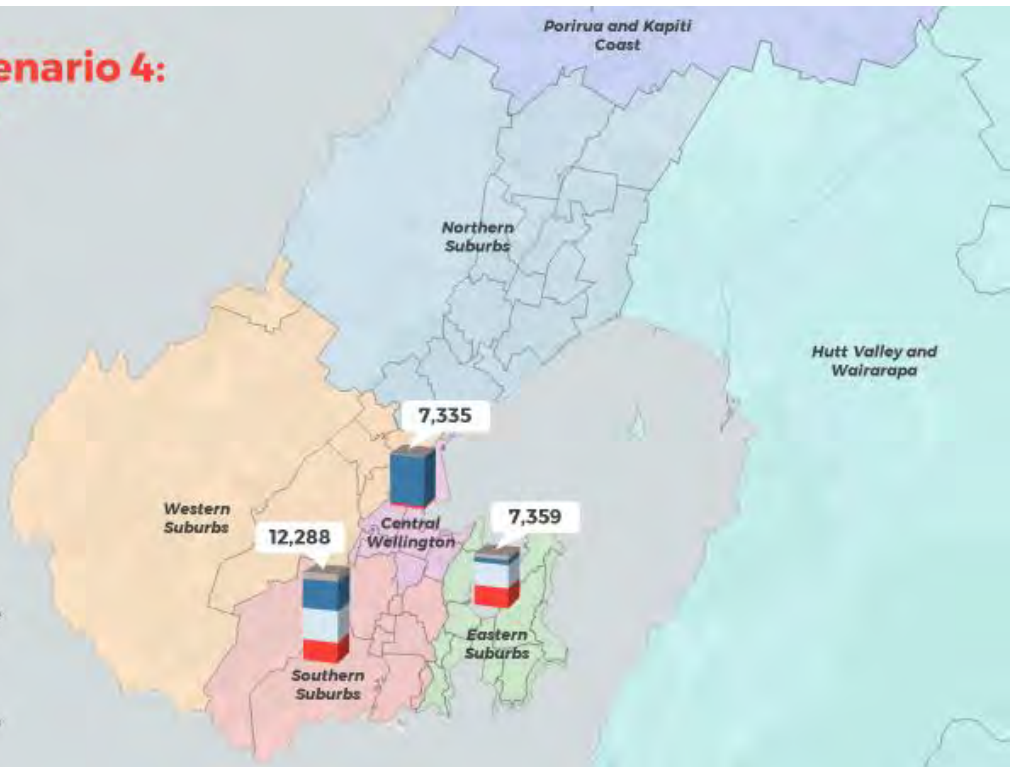


Disruption Scenario 4:

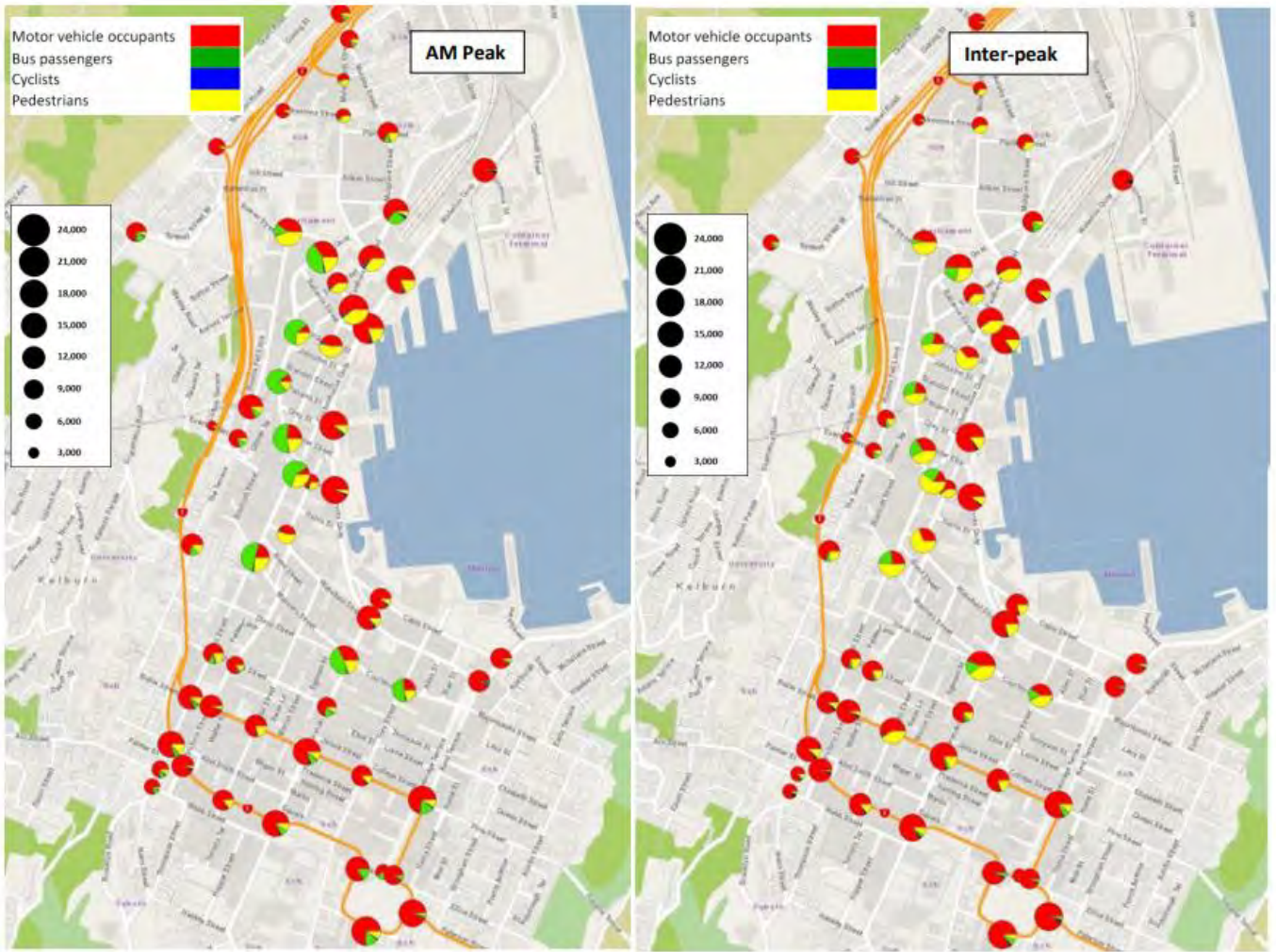
Basin Reserve Grade Separation

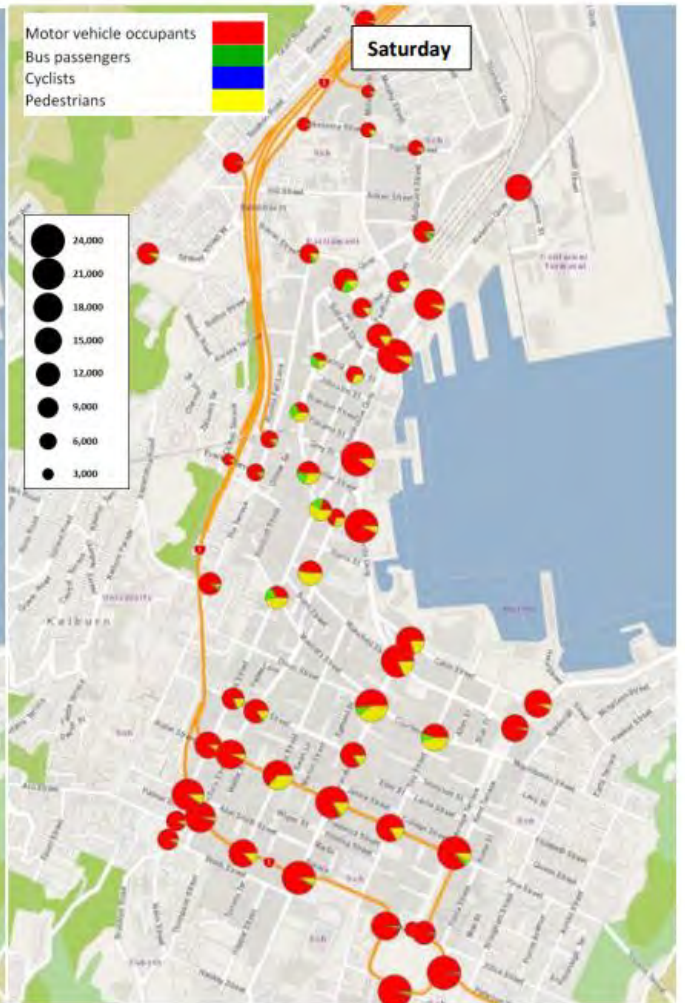


This map depicts potential impact of the disruption scenarios on journey to work trips into the city centre that may be directly impacted. It assumes all trips from these areas will be impacted in some way and excludes trips through the city centre - e.g. trips from the region to the airport and the hospital. It also does not reflect all possible modes.



Appendix 3 – Traffic Through Intersections in the CBD





Appendix 4 – Off-Peak Travel Bus Fare in Wellington

Off-peak travel



Please refer to the latest COVID-19 updates >

Travel off-peak on a Metlink bus or train and save 25% of your Snapper or 10-trip fares. All you need to do is start your bus journey or rail trip on a service scheduled at an off-peak time.

Off-peak fares aren't available when using cash, on [non-Metlink services](#), on After Midnight bus services, if you are travelling on another concession such as [Child](#), [Tertiary](#), or [Accessible](#), or if you're using a period pass such as a monthly or day pass.

Off-peak hours

Weekdays	9am - 3pm After 6.30pm
Weekends	All day
Public holidays	All day

Buses

- If you catch the bus you will need to use your [Snapper card](#), just swipe on and your trip will be 25% cheaper than a peak fare
- For example, a bus trip from Jackson Street in Petone to Lambton Quay will cost an adult \$4.20 during peak hours and \$3.15 in off-peak – \$1.05 savings

Trains

- If you catch the train you will need to purchase an [Off-Peak 10-Trip ticket](#) covering the zones you want to travel to get the 25% discount
- For example, a train trip from Upper Hutt Station to Wellington Station costs \$7.40 on a regular 10-Trip ticket during peak and \$5.55 using an Off-peak 10-Trip ticket, saving you \$1.85

Appendix 5 – Disruption Scenario Infographics

Let's GET Wellington MOVING

Travel Behaviour Change Strategies for Disruption Scenarios

A Travel Behaviour Change (TBC) package provides the Wellington community with a real opportunity for people living in Wellington to re-think how they travel.

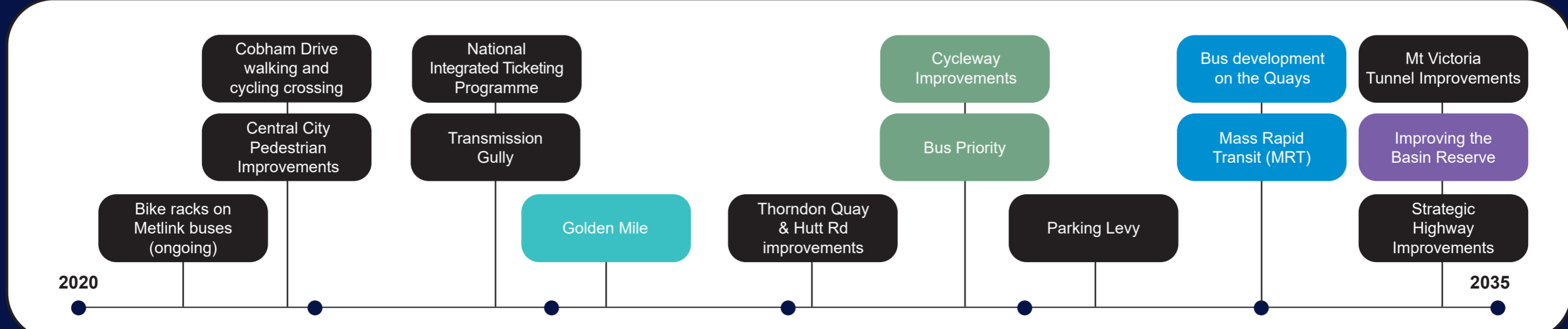
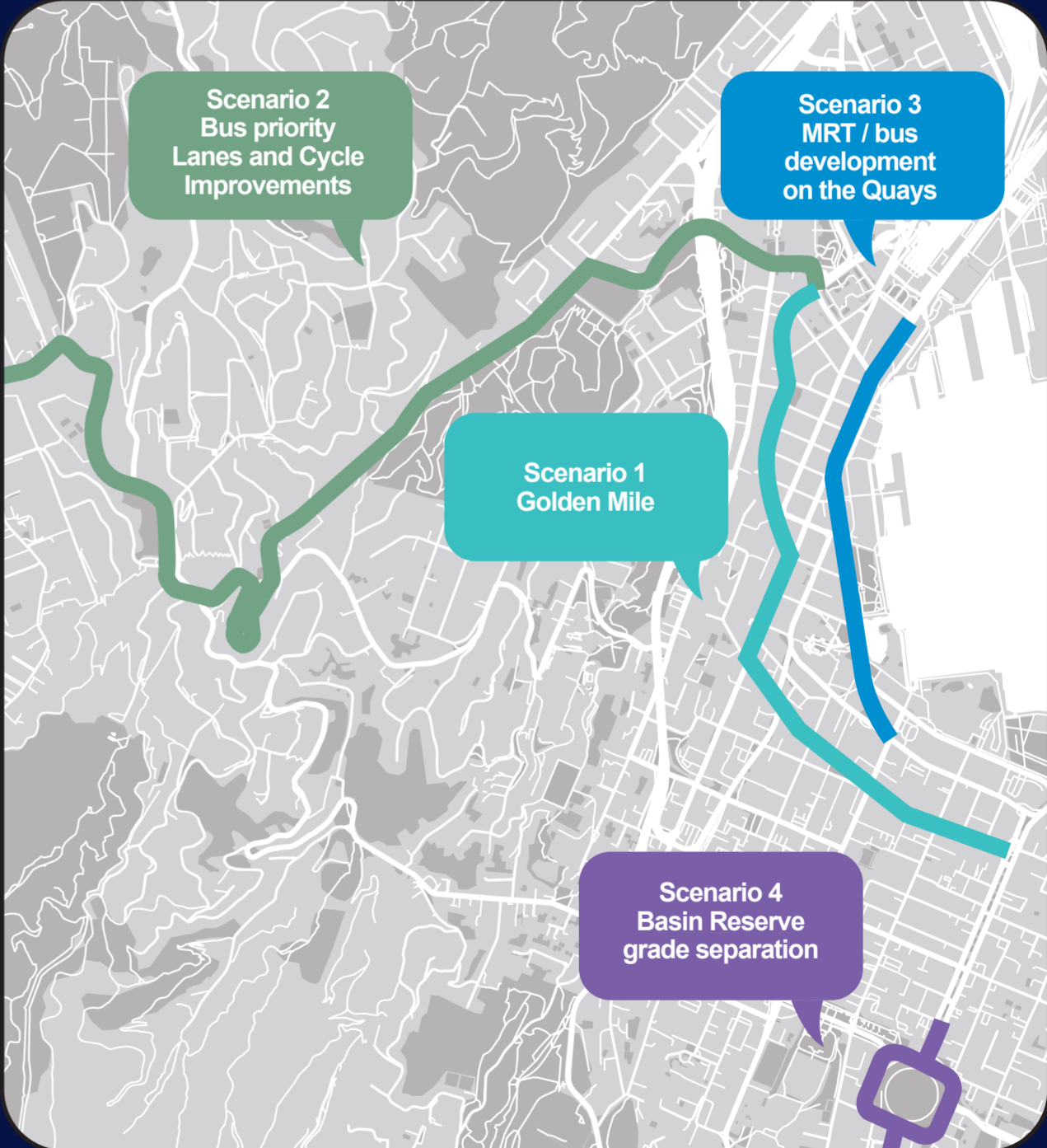
The TBC package will be designed to work alongside improvements to the capacity, performance and reliability of public transport and improvements in active transport networks. As the delivery of LGWM's city shaping transport projects will result in construction related disruption, an analysis of four disruption scenarios has been undertaken.*

Communicating the right information, to the right people, at the right time and in the right way will be key to the success of the disruption TBC campaign. Travel plans (workplace, school and events) which deliver a comprehensive suite of behaviour change measures and a robust Communications Plan, as part of the overarching strategy will use the following core themes to deliver messages and campaigns.

*Some of the people affected by disruption may fall into more than one group or people may be impacted by more than one disruption

Whāiti Whakāwhaiti ngā haerenga huakore Reduce avoid unnecessary travel	Ara tika Whāia ngā ara e wātea i ngā mahi hangahanga Re-route avoid areas of construction	Wā tika Panonitia Ōu whakaritenga kia wātea ake ngā huarahi Re-time travel outside of busy periods	Momo waka Whakamaenahia ngā momo waka rerekē Re-mode encourage a shift away from car driving

Re-think your trip
Whakahou i ngā whakaaro



Disruption Scenario 1

Let's GET Wellington MOVING



Golden Mile

WHAT IS THE DISRUPTION?

The Golden Mile (Lambton Quay to Courtenay Place) is the heart of Wellington and has been classified as a key public transport route.

This area is being redesigned to make it better for people walking and on bikes, and give buses more priority.

Delivering these improvements will result in construction-related disruption.

This means there will temporarily be less space and crowding on the footpath when walking on the Golden Mile.

There will be a net reduction in car parks during and after construction, access by private vehicles will also be restricted (some or all the times), side streets will be closed, and loading zones and taxi stands will be relocated to side streets.



After construction, there will be more space for people on foot and on bikes, and buses will be faster and more reliable.

ROAD CLOSED

WHO WOULD BE AFFECTED?



People driving
6,500

Around 6,500 people travel by vehicle along part of the Golden Mile on a typical weekday.



People on buses
36,000

36,000 people travel by bus along part of the Golden Mile every weekday.



Walking routes
31,000

Busiest area for city walking, 31,000 people walk along part of it during a typical weekday.



Cycling routes
300

Over 300 people cycle along part of the Golden Mile on a typical weekday.



15,500

In total, about 15,500 people arrive to Wellington Station between the AM peak (7.00 AM – 9.00 AM).



90%

90% of people arriving by train walk to their final destination.

WHEN WILL THE DISRUPTION BE?

YEAR
2021/22

Could start in the 2021/22 financial year. While delivery could last for 1.5-2.5 years, it is expected that construction would be focused at localised sites progressing sequentially along the corridor.

What does this disruption mean for customers?



Normal travel times will likely increase and become unpredictable



PUBLIC TRANSPORT

Bus may take longer than usual to travel along the Golden Mile

Journeys may be more unreliable

Where people normally catch the bus may change (temporarily or permanently)

Buses may be rerouted



ACTIVE TRAVEL

There will be dust and noise from the construction at times

While works are underway, at busy times of the day, footpaths may be more congested and you may have to squeeze up on the footpath

There will be some temporary diversions in place

DIVERSION



TRAVEL BY CAR

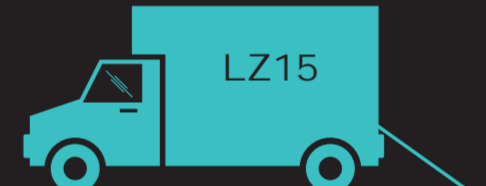
Driving will no longer be a suitable option for travelling the Golden Mile

Road layout will change frequently, it could be confusing and wayfinding may be challenging

Access to parking from the Golden Mile could be affected by construction



Pick up points for taxis and ride-hailing companies may change



SERVICES & DELIVERY

Loading zone locations will move and will affect the way deliveries are managed

LOADING ZONE

RETAILERS & CUSTOMERS

Customers who need parking may find it difficult



People accessing shops and businesses may find it difficult to navigate the space

What is the targeted strategy for this disruption?

PUBLIC TRANSPORT

Maintain current patronage

- Encouraging people to get off the bus one stop earlier and walk
- Encourage active or micromobility for short trips instead of using the bus
- Communication about off-peak public transport fares (9.00am - 3.00pm and after 6.30pm)
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie



ACTIVE TRAVEL

First choice for short trips

- Communicate the need to allow more time for trips on foot
- Run active travel competitions, challenges
- Partner with shared micromobility providers so that customers can find good routes and drop zones are obvious
- Work with construction teams to embed a customer-centric approach to minimise disruption for people using active modes



TRAVEL BY CAR

Plan ahead and drive only if you have to

- Encourage people driving to plan ahead
- Communicate permanent net loss of parking and alternative parking options
- Incentives to use active and shared modes eg public transport trial passes
- Construction worker travel plan to reduce driving and parking at construction sites



Communication across multiple platforms in advance of and during disruption

SERVICES & DELIVERY

- Consolidate deliveries
- Communicate new location of loading zones

RETAILERS & CUSTOMERS

- Clearly communicate through business associations about potential delays to deliveries, access issues and loss of on-street parking

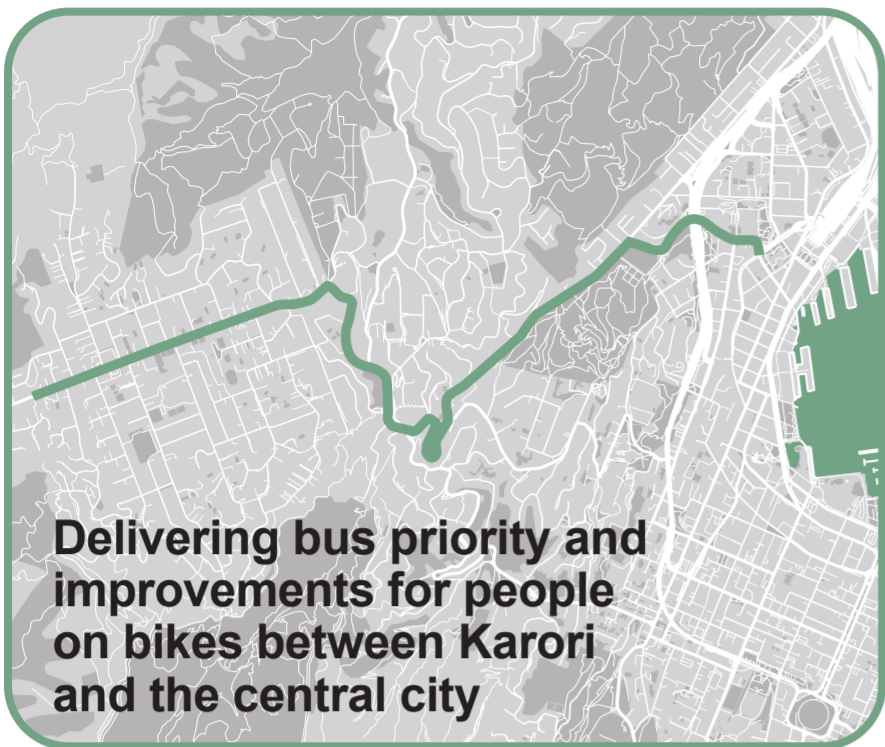


Disruption Scenario 2

Let's GET

Wellington

MOVING



Delivering bus priority and improvements for people on bikes between Karori and the central city

WHEN WILL THE DISRUPTION BE?

YEAR
2021-2027

Delivery could be between 2021 and 2027 and will last for 12 months. It is expected that construction would be focused at localised sites progressing sequentially along the corridor.

WHAT IS THE DISRUPTION?

This 6km-long route connecting the western suburbs to the central city is being improved for people on buses and bikes. Delivering these improvements will cause disruption during construction due to dedicated cycling facilities, changes at intersections including the installation of bus queue jumps, relocation of bus stops along the route and construction of bus stop build outs to create in-line bus stops.



Physical works likely to be delivered progressively along the route, section by section

Following construction, there will be less road space for cars, however public transport will see significant improvements in services and priority, and cyclists will have dedicated on-street facilities or pathways. Golden Mile will also have been improved for these users.



WHO WOULD BE AFFECTED?



People driving
2,517

2,517 vehicles head toward the CBD via the Karori tunnel in the morning peak.



People on buses
2,000

The Karori bus service (route #2) transports around 2,000 passengers heading towards the CBD during the AM peak; buses coming from Karori are generally quite full and take on average 5-10 mins longer during peak times.



People on bikes
234

234 people on bikes travel through the Karori tunnel toward the city centre on an average weekday.



School Drop-offs

Schools and colleges along the route will be affected by disruption (Samuel Marsden, Queen Margaret College, and other schools)

What does this disruption mean for customers?



During construction, there may be some increased delays for all road users



PUBLIC TRANSPORT

Where people normally catch the bus may change (temporarily or permanently)

Buses may take longer than usual to get to the city centre

Journey times will be less reliable

Currently at peak times, many people do not get a seat, this is likely to be worse as buses will be busier than normal



ACTIVE TRAVEL

Cycling may not be a viable option in the short term while bus priority and permanent cycle facilities are constructed

Walking along the footpaths may not be very comfortable and could be slower in the local centres along the route



TRAVEL BY CAR

During and post construction, be prepared for less road space for cars along this route as lanes are reallocated to buses and cyclists

Traffic may be worse than usual, especially during peak times. Temporary diversions will be in place

Alternative routes might also busier than usual

Parking along the route will no longer be available

Pick up points for taxis and ride-hailing companies may change



BUSINESSES & RESIDENTS

Parts of Karori Road will be disrupted by construction for awhile which means deliveries might need to be rearranged and how people access business along the route may change

Access to the local streets may change temporarily

Parking will no longer be available along Karori Road



What is the targeted strategy for this disruption?

PUBLIC TRANSPORT

Encourage travel by public transport at less busy times for a more comfortable journey

- Communicate off-peak public transport fares (9.00am - 3.00pm and after 6.30pm)
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie
- Communicate that people need to allow for extra time to get to work and school while works are underway

ACTIVE TRAVEL

This disruption is temporary, get ready for better facilities

- Encourage people to walk or cycle for short, local trips
- Run active travel competitions, community events and incentives to encourage participation in car free days and walk/bus/bike to work days
- Work with construction teams to embed a customer-centric approach to minimise disruption for people using active modes
- Create and communicate safer alternative routes that cyclists or scooter users can travel on to avoid the construction area
- Bike maintenance and skills training to encourage uptake

TRAVEL BY CAR

Plan ahead, share that ride and drive only if you have to

- Encourage people driving, taking a taxi or ride hail service to plan ahead
- Communicate alternative routes, travel times and disruption-related delays through journey planning and navigation apps
- Encourage carpooling and ride sharing during disruption
- Work with the construction team to make sure temporary and permanent changes to mobility parks are obvious and well communicated



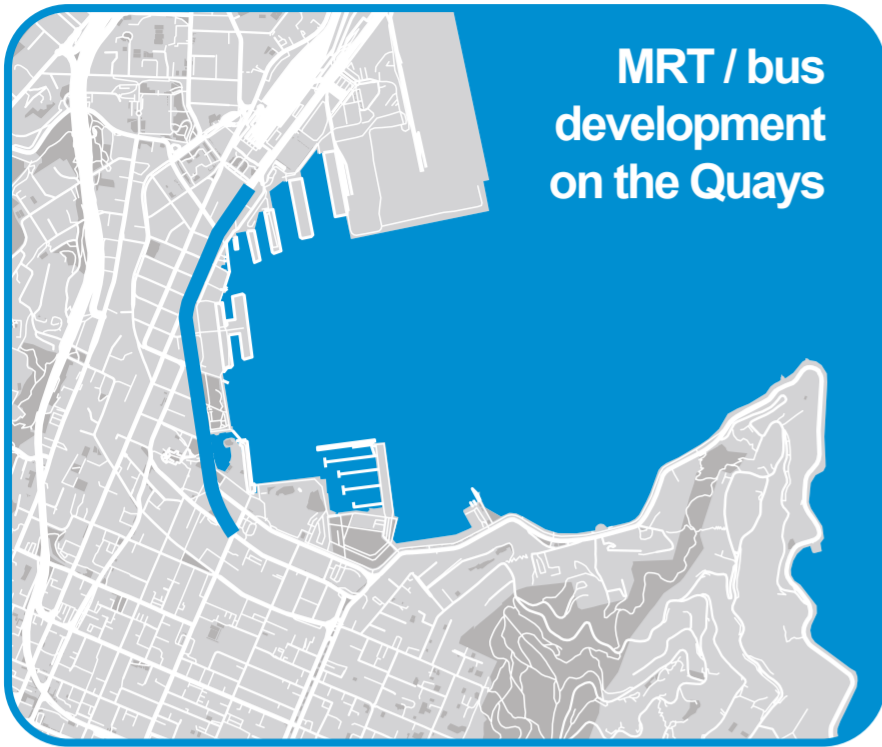
Communication across multiple platforms in advance of and during disruption

SERVICES & RESIDENTS

- Communicate through business associations about potential delays to deliveries, access issues and loss of on-street parking
- Provide information about delays or disruptions ahead of time or as they're happening
- Promote, sponsor, establish and share details of existing co-working spaces in or near Karori so workers could use instead of travelling into town
- Flexible working toolkit for employers

Disruption Scenario 3

Let's GET Wellington MOVING



MRT / bus development on the Quays

WHAT IS THE DISRUPTION?

Delivery of Mass Rapid Transit (MRT) along this predominantly traffic route, will result in the creation of a second public transport spine through and past the central city. The objective of this work is to create a new mass transit route connecting the Railway Station with Newtown and the eastern suburbs that moves more people, goods and services reliably, with fewer vehicles.



Delivery of MRT will involve allocating road space for the public transport use only and construction of new BRT stations and platforms. Depending on the option selected, it could involve relocation of buried services and road.



This will disrupt travel, may cause traffic delays that have the potential to impact up and downstream parts of the quays as well as surrounding road networks.



After construction, capacity for general traffic will be reduced while public transport and cycling facilities will be significantly improved.

WHO WOULD BE AFFECTED?



People driving
4,000

Just under 4,000 people in private vehicles enter the CBD from Aotea Quay / Waterloo Quay during the AM peak (Wellington CBD cordon survey 2016). This represents one of the highest flows of motor vehicle volumes in the city.



Travelling by TRAIN

People travelling by train will most likely walk along/cross the Quays for the last part of their journey.



Pedestrians
1,000

Pedestrian use of the Quays is limited near the port end but picks up near Wellington Station. About 1,000 people were observed crossing the CBD cordon along Customhouse Quay during the AM peak (Wellington CBD cordon survey 2016).



Impacted by DELAYS

People accessing the cross-channel ferries (Bluebridge, Interislander and CentrePort) may be impacted by delays on the Quays.



70 Trucks

According to counts in Aotea Quay in 2016, a peak truck flow of 70 trucks per 15 minutes was observed. This is significantly higher than other locations.

WHEN WILL THE DISRUPTION BE?

YEAR
2028

The delivery of MRT may commence soon after 2028 and could take several years to complete.

What does this disruption mean for customers?



Driving is not the best way to travel through this area during disruption, use alternatives



PUBLIC TRANSPORT

Your journey from the railway station to your final destination may take longer than usual, due to footpath crowding, or be rerouted



ACTIVE TRAVEL

While works are underway streets could change frequently and wayfinding could become challenging when accessing the waterfront and crossing the Quays

There may be construction related dust and noise at times



TRAVEL BY CAR

There will be a permanent reduction in capacity for vehicles through this area as car lanes are reallocated to MRT

Your trip may take longer than usual so expect delays if you're driving along the Quays

Alternative routes may also be busier than usual

People driving from the west and some from the north will be impacted the most, during peak times



SERVICES & DELIVERY

Some loading zone locations will move and will affect the way deliveries are managed

Freight and trucks going to the Port may encounter delays and detours

RETAILER & CUSTOMERS

People accessing businesses may find it difficult to find their way if side roads or footways are temporarily closed

What is the targeted strategy for this disruption?

PUBLIC TRANSPORT

Best choice for long trips

- Provide up-to-date information via journey planning and MaaS tools
- Work with Metlink to ensure events during disruption are prioritised for free fares, ensure events advertise if they qualify for the free Metlink fares for events



ACTIVE TRAVEL

Best choice for short trips

- Work with construction teams to embed a customer-centric approach to minimise disruption for people using active modes
- Communicate changes and alternative routes from the rail station



TRAVEL BY CAR

Plan ahead, and use alternatives where possible

- Work with construction companies to manage the number of vehicles used to commute to construction sites
- Work with the construction team to make sure temporary and permanent changes to mobility parks are obvious and well communicated
- Encourage people to plan ahead for trips to the ferry terminals



Communication across multiple platforms in advance of and during disruption

SERVICES & DELIVERY

- Communicate with freight and courier companies to keep them informed of route changes or delays via journey planning apps or EROADS
- Consolidate deliveries and co-ordinate pick up/drop off

RETAILER & CUSTOMERS

- Communicate through business associations about potential disruption/delays to deliveries, loss of on-street parking and access issues

Disruption Scenario 4

Let's GET Wellington MOVING



Basin Reserve grade separation

WHAT IS THE DISRUPTION?

The Basin Reserve is a historic cricket ground within a small traffic gyratory with 3/4 circulatory traffic lanes. The construction associated with Basin Reserve grade separation will create disruption as there will be construction directly within the transport corridor, occupying at least 50% of the existing transport corridor at any one time. Access to schools, adjacent properties and through to Wellington Hospital and International Airport will be maintained. It is likely that during construction traffic will voluntarily divert to the adjacent transport network, with some routes eg Tasman Street and Oriental Parade experiencing an increase in traffic volumes. Limited alternate routes to the Basin will result in Wallace and Taranaki Streets being congested which will affect people on buses and people on bikes on Oriental Parade.

Post-construction, the grade-separation of north-south and east-west traffic will enable travel via MRT to the Hospital and it will reduce conflict with traffic on SH1 east-west, including trips to the Airport. This will also improve walking and cycling access between the south of the city and the city centre.



WHO WOULD BE AFFECTED?



Mt Victoria Tunnel
2,900

Traffic counts for Mt Victoria tunnel show that 2,900 vehicles travelled this route during the PM peak. Kent and Cambridge Terraces (South of Vivian Street) traffic counts indicate high volumes, particularly southbound with 3,900 vehicles passing through this area during both AM and PM peaks.



By private car
40%

Routes through the Basin Reserve provide a key link to the hospital and airport. A 2011 survey identified that about 40% of all journeys to and from the airport occur by private car, just over half occur by taxi, and about 5% occur by public transport.



Pedestrian Peak
8-9am

Pedestrian data from 2016 shows there is an AM peak for people walking along Adelaide Road between 8.00 AM – 9.00 AM due to the nearby schools. A corresponding PM peak is assumed between 2.00 PM – 3.30 PM.



People on buses
Over 11,400

Bus passenger numbers from a 2013 report around the Basin Reserve indicate by 2021 southbound passengers will be over 10,400 during PM peak. Northbound bus trips will carry over 11,400 people during AM peak.



Health services

Ambulance and patient trips to the hospital will be impacted.

WHEN WILL THE DISRUPTION BE?

YEAR
2028

The delivery of the changes at the Basin Reserve are unlikely to start before 2028. It is possible that the delivery of grade separation at the Basin Reserve may take 2 - 3 years.

What does this disruption mean for customers?



Normal travel time will likely increase, potentially in an unpredictable way



PUBLIC TRANSPORT

- Expect delays when traveling via Basin Reserve to the Hospital and Airport
- Where you normally catch your bus might change for a while (or in some cases, permanently)
- Buses may be busier than usual and you may not be able to get a seat during busy times
- Buses may take longer than usual to travel along the corridor
- It might take longer to get to school or university
- Buses may be rerouted



ACTIVE TRAVEL

- People walking and cycling through the Basin Reserve will need to find an alternate route
- As with people who cycle, people who walk may find that the space is arranged differently or rerouted
- People crossing Victoria Tunnel may find their trips take longer or are rerouted



TRAVEL BY CAR

- Journey times will be delayed and unpredictable
- Driving may not be the most reliable way to travel through the Basin Reserve
- It may take longer than normal to drive through this area
- Travel between the city and South Wellington eg access to the hospital, may be more congested than usual
- Road layouts could change frequently and wayfinding could become challenging
- Pick up points for taxis and ride-hailing companies may change



SERVICES & DELIVERY

Potential access issues and delays during disruption



RETAILER & CUSTOMERS

Customers may experience difficulty getting into and out of car parks due to congestion

What is the targeted strategy for this disruption?

PUBLIC TRANSPORT

Encourage off peak travel on buses

- Work with Metlink to ensure events during disruption are prioritised for free fares, ensure events advertise if they qualify for the free Metlink fares for events
- Communicate with schools in advance so parents can plan ahead for students to catch an earlier bus
- Communicate bus stop location/route changes in advance using tools such as MaaS alerts or an animated bus map movie

ACTIVE TRAVEL

Take alternative routes where possible

- Designate an off-site drop off area that allows students to walk into the school and will reduce congestion
- Work with construction teams to embed a customer-centric approach that minimises disruption for people using active modes
- Encourage people to walk or cycle for short, local trips
- Run active travel competitions, community events and incentives to encourage participation in car free days and walk/bus/bike to work days
- Make it easier for people to walk or cycle to the Airport from surrounding suburbs

HOSPITAL AND AIRPORT TRAVELLERS (ALL MODES)

Communicate the need to allow more time for a trip to the Hospital or Airport

- Work with the Hospital and Airport to help patients or travellers to plan their trip (understand travel options, how much extra time to allow, best times to travel)
- Use various media channels & journey planning/ MaaS apps to get messages out about delays & the best travel choices
- Work with the Airport and Hospital to support people who arrive early or late (comfortable waiting; flexible scheduling where possible; contingency for late arrivals)
- Improve end-of-trip facilities for bicycles and e-bikes at the Airport and Hospital
- Luggage transport options eg luggage logistics service between the airport and local origin/ destination
- Make it easier for people to walk or cycle to the Airport from surrounding suburbs



Communication across multiple platforms in advance of and during disruption

TRAVEL BY CAR

Only drive through this area if necessary, emphasise the need to allow more time to get to the Hospital or Airport

- Designate an off-site drop off area that allows students to walk into the school to reduce local congestion
- Communicate that driving trips through the Basin Reserve to the airport and hospital will be delayed
- Encourage the use of airport park and rides as an alternative to parking at the Airport

Appendix I: Option Comparison Framework

Option comparison framework

A multicriteria assessment was used to compare the performance of the alternative packages at a high level. The criteria used to assess packages is outlined below:

Table 0-1 Option comparison criteria

1. Effectiveness against project objectives:	
<p>Objective A: improve access to and through the central city by making sure people know that the available travel choices will work for them</p>	<p>This criterion focuses on two aspects, one being information provision and the second is about making travel options ‘real’ to people, in other words, empowering people to make informed decisions. Most people in Wellington already know of the available travel options but not necessarily how the options could work for them. In scoring the packages, the following key points have been considered subjectively:</p> <ul style="list-style-type: none"> ○ how many people will be reached by the package? ○ to what extent will this package change the community’s appreciation of convenience or appropriateness of the available travel choices?
<p>Objective B: minimise disruption to people and business by making sure they are aware of upcoming changes, how it will affect their journeys and understand their travel options during delivery of work to improve and renew the city¹</p>	<p>Similar to objective A, this criterion is also about information provision but specific to the trigger of disruption. In scoring the packages, the following key points have been considered:</p> <ul style="list-style-type: none"> ○ how many of these people already make trips to and through Wellington City Centre? ○ to what extent will people understand how their travel options will be affected? ○ to what extent to which the packages be effective in providing information and empowering people to make informed decision during disruption?
<p>Objective C: make best use of the transport network by encouraging people to travel less often and at less busy times²</p>	<p>This criterion is about encouraging people to change time of travel or working from home. It acknowledges that people will still be driving but either at less busy times or take fewer trips. In scoring the packages, the following key points have been considered:</p> <ul style="list-style-type: none"> ○ how many people will be reached by the package? ○ how effective the packages will be in achieving this objective?
<p>Objective D: make best use of the available transport options by reducing the proportion of people that drive alone during busy times³ or for short trips</p>	<p>This criterion is about reducing people that drive alone during busy times or for short trips. It acknowledges that some people will still drive but ideally with more people in the car during busy times or only for longer trips.</p>
<p>Objective E: improve the health, safety and wellbeing of communities by increasing the number of trips that involve</p>	<p>This objective is about mode shift towards active modes and public transport regardless of trip purpose. It’s about gaining health, safety and wellbeing benefits from more people being more active in their daily lives.</p>

¹ Includes delivery of Let’s Get Wellington Moving, three waters renewals, building construction, major events

² Busy times include weekends

³ Busy times include weekends

active modes and public transport	
2. Culture change potential	In scoring the packages for their culture change potential, the following key points have been considered: <ul style="list-style-type: none"> o Winning hearts and minds: does the package focus on trips wider than commute and journey to education trips o Societal change: reaching children (not just through school TPs, but for how they play/ meet each other in their neighbourhoods); being there for 'life' triggers that provide opportunity for travel behaviour change whole-of-life o ability to scale back on initiatives as societal norms change
3. Risk	In scoring the packages for risk, the following key points have been considered: <ul style="list-style-type: none"> o risk that the expected outcomes (scoring against the objectives) are not achieved o reliance on other budgets o the extent to which it's been done before in NZ
4. Number of people reached	Number of people reached: resident population, workers, education)
5. Cost/resource	Cost and resource requirements of delivering each of the alternative packages

Criterion 1 and 2: 'effectiveness against project objectives' and 'culture change potential' have been assessed using a 5-point scale as shown below:

How well the package delivers on the criteria	1 Low
	2 Low-med
	3 Med
	4 Med-high
	5 High

Criterion 3: 'risk' is assessed using a three point scale (low, medium and high).

Risk	High
	Med
	Low

Criterion 4 and 5: 'number of people reached' and 'cost/resource' reported as they are for comparison purposes. These are not scored.

Assessment summary

Result of the MCA scores is provided in **Error! Reference source not found.** The analysis carries a high level of subjectivity as there are numerous unknown factors. By undertaking this analysis, the team has been able to daylight the key differences between the packages in terms of their effectiveness, risks

and cost/resource differences. The scores are guided by professional judgement as well as quantitative analysis that could be undertaken at the time of writing this report.

1. Effectiveness against project objectives

- *Objective A: improve access to and through the central city by making sure people know that the available travel choices will work for them*

Packages A, B and C will likely have a similar impact in achieving this objective as the number of people targeted or the potential impact is not significantly different within the three packages. Packages D and E score higher than the other packages by incorporating measures to achieve long term culture change and by focusing on creating a 'ripple effect'. Targeting home locations and a wide range of trips, combined with a focus on where people work means that it will be easier to get the message to land as travel behaviour change starts to appear in more of people's lives.

None of the packages score the highest score because as a standalone measure (in the absence of a trigger), effectiveness will be limited.

- *Objective B: minimise disruption to people and business by making sure they are aware of upcoming changes, how it will affect their journeys and understand their travel options during delivery of work to improve and renew the city*

All packages have been scored the same, as the strategic interventions focusing on information provision about travel choices are common to all packages, independent of location.

This has been scored differently to objective A because disruption is a trigger; people will pay more attention when their journey is impacted by disruption and be more willing to receive and engage with information.

None of the packages received the top score as disruption can only be mitigated not eliminated.

- *Objective C: make best use of the transport network by encouraging people to travel less often and at less busy times*

Packages A, B will not have as much impact as packages C, D and E. Encouraging people to change time of travel or working from home measures are common to all packages and although the number of people being targeted doesn't change, the messaging lands better with packages C, D and E due to the synergy with other strategic interventions.

Packages C, D and E include measures that will actively reduce the appeal of driving (and driving alone) and start to shift behaviour of people that are currently less willing (eg people with access to company cars and car parks).

Packages D and E add an additional dimension of culture change and ripple effect by targeting much more of people's lives. These packages over time will start to change/shape places that people live in how they experience it. However, as this objectives focuses on trips during peak periods, the impact of package D and E is considered to be the same.

- *Objective D: make best use of the available transport options by reducing the proportion of people that drive alone during busy times or for short trips*

Package A achieves the lowest score compared to the other packages as it is closest to the business as usual approach and does not include initiatives to reduce the appeal of driving. Package B is scored higher than package A but not as high as packages C, D and E. This is because package B assumes that the first/last leg scope will have a limited budget and be limited to walking/cycling and therefore will not carry as great a potential to shift from driving to public transport compared to other

high cost initiatives like on-demand shuttles and subsidised Ubers. There is potential to increase this score if the scope of first/last leg initiatives is broadened.

Package C adds initiatives to reduce the appeal of driving which start to shift the behaviour of people that are currently less willing (eg people with access to company cars and car parks).

Packages D and E are scored higher than the other packages as they add an additional dimension of culture change and ripple effect by targeting much more of people's lives. These packages over time will start to change and shape places that people live in and influence how they experience it.

None of the packages score the highest score because of the limited scope of first/last leg schemes.

- *Objective E: improve the health, safety and wellbeing of communities by increasing the number of trips that involve active modes and public transport*

Packages A, B and C will deliver on this objective to varying levels but the packages D and E are more closely aligned with its intent. Package E is scored higher than package D as it has a wider geographic reach.

2. Culture change

The key difference between the packages is that packages A, B and C will meet the objectives to varying degrees but they will not deliver the systemic culture changes over time that packages D and E will.

Additionally, Package E is scored higher than package D as it has a wider geographic reach.

3. Risk

Risk of not delivering on the objectives as expected is considered low for package A (but it will be less effective compared to the other packages due to its narrow scope). Packages B and C carry a higher risk compared to package A as they rely on other budgets for delivery.

Packages D and E will have more impact but they carry a high risk around the ability to achieve the predicted impact as initiatives focusing on culture change have not been adopted at this scale in NZ.

4. Number of people reached

Package E will reach the greatest number of people (resident population, workers, education) as it has the largest geographic reach. The other packages have a similar number of people working, travelling to education or living within areas targeted.

5. Cost and resources

Refer to the table on the next page.

Multicriteria assessment summary of the alternative packages

Criteria	Considerations	Package A	Package B	Package C	Package D	Package E
		Scaling up 'business as usual'	Package A + first/ last leg in the outer areas	Package B + reduce the appeal of driving	Package C + public transport everywhere + ripple effect (inner suburbs) + culture change (inner suburbs)	Package D + public transport everywhere + active modes everywhere + ripple effect everywhere + culture change everywhere
Objective A. improve access to and through the central city by making sure people know that the available travel choices will work for them	<ul style="list-style-type: none"> o how many people will be reached by the package? o to what extent will this package change the community's appreciation of convenience or appropriateness of the available travel choices? 	2	2	2	3	3
		Limited to PT in outer areas and active modes in inner areas. May not significantly improve choice or convenience. Limited geographic reach.	Limited to PT and first/last leg in outer areas and active modes in inner areas. May not significantly improve choice or convenience. Limited geographic reach.	Limited to PT and first/last leg in outer areas and active modes in inner areas. Addressing the ease of driving and parking will increase the need to understand travel choices. Limited geographic reach.	Easier to get the message to land as TBC appearing in more of people's lives. Will increase reach by incorporating culture change and ripple effect as well as geographic coverage.	Easier to get the message to land as TBC appearing in more of people's lives. Will increase reach by incorporating culture change and ripple effect as well as geographic coverage.
Objective B. minimise disruption to people and business by making sure they are aware of upcoming changes, how it will affect their journeys and understand their travel options during delivery of work to improve and renew the city[1]	<ul style="list-style-type: none"> o how many of these people already make trips to and through the central city? o to what extent will people understand how their travel options will be affected? o to what extent to which the packages be effective in providing information and empowering people to make informed decision during disruption? 	4	4	4	4	4
		Common to all packages - people know about their choices, how they'll be affected by disruption and what they can do about it.	Common to all packages - people know about their choices, how they'll be affected by disruption and what they can do about it.	Common to all packages - people know about their choices, how they'll be affected by disruption and what they can do about it.	Common to all packages - people know about their choices, how they'll be affected by disruption and what they can do about it.	Common to all packages - people know about their choices, how they'll be affected by disruption and what they can do about it.
Objective C. make best use of the transport network by encouraging people to travel less often and at less busy times[2]	<ul style="list-style-type: none"> o how many people will be reached by the package? o how effective the packages will be in achieving this objective? 	3	3	4	5	5
		Common to all however, it will be less effective at encouraging less travel and peak spreading compared to packages C, D and E.	Common to all however, it will be less effective at encouraging less travel and peak spreading compared to packages C, D and E.	Common to all and Package C introduces specific initiatives to reduce the appeal of driving which will enhance the degree to which this objective can be met	Common to all and Package D includes specific initiatives to reduce the appeal of driving as well as the added dimension of culture change which (over time) will enhance	Common to all and Package D includes specific initiatives to reduce the appeal of driving as well as the added dimension of culture change which (over time) will enhance

Criteria	Considerations	Package A	Package B	Package C	Package D	Package E
		Scaling up 'business as usual'	Package A + first/ last leg in the outer areas	Package B + reduce the appeal of driving	Package C + public transport everywhere + ripple effect (inner suburbs) + culture change (inner suburbs)	Package D + public transport everywhere + active modes everywhere + ripple effect everywhere + culture change everywhere
					the degree to which this objective can be met	the degree to which this objective can be met
Objective D. make best use of the available transport options by reducing the proportion of people that drive alone during busy times[3] or for short trips	<ul style="list-style-type: none"> o informed by forecast change in # trips by mode for separate purposes o work o school o other 	1	2	3	4	4
		Will have some impact, but does not focus on reducing the appeal of driving and parking.	Will have some impact, but does not focus on reducing the appeal of driving and parking. Scored low because we have assumed that the first/ last leg scope will have a limited budget and hence a walk/ cycle focus and therefore not as great potential to shift from drive to PT (as you'd be able to achieve with on-demand shuttles or subsidised ubers).	Reduces appeal of driving - packages C, D and E will focus on businesses implementing policies to reduce the appeal of driving	Culture change and ripple effect boosts the impact of reducing the appeal of driving and parking. Focus on inner suburbs	Culture change and ripple effect boosts the impact of reducing the appeal of driving and parking. Across the region.
Objective E. improve the health, safety and wellbeing of communities by increasing the number of trips that involve active modes and public transport	<ul style="list-style-type: none"> o informed by forecast change in # trips by mode for separate purposes o work o school o other 	2	3	3	4	5
		Increased uptake of PT and active modes limited in geographic focus.	Slightly increased uptake of PT and active modes through first/last leg.	Reducing appeal of driving will not result in a significant jump in active travellers when compared to package B.	Adding ripple effect and culture change will further increase PT and active mode trips. Geographically focused minimises the full potential.	Adding ripple effect and culture change will further increase PT and active mode trips. Region-wide maximises the full potential.
Culture change	<ul style="list-style-type: none"> o Winning hearts and minds: does the package focus on trips wider than commute and journey to education trips o Societal change: reaching children (not just through school TPs, but for how they play/ meet each other in their neighbourhoods); being there for 'life' triggers that provide opportunity for travel behaviour change whole-of-life o ability to scale back on initiatives as societal norms change 	1	1	2	4	5

Criteria	Considerations	Package A	Package B	Package C	Package D	Package E
		Scaling up 'business as usual'	Package A + first/ last leg in the outer areas	Package B + reduce the appeal of driving	Package C + public transport everywhere + ripple effect (inner suburbs) + culture change (inner suburbs)	Package D + public transport everywhere + active modes everywhere + ripple effect everywhere + culture change everywhere
		Focus on specific strategic interventions in specific areas will result in localised changes, but will not build the foundation for culture change.	Focus on specific strategic interventions in specific areas will result in localised changes, but will not build the foundation for culture change.	Reducing the appeal of driving will shift social norms alongside the other strategic interventions, to an extent.	Significant focus on culture change, shifting social norms in communities. Focused in inner suburbs for D.	Significant focus on culture change, shifting social norms in communities. Across the entire region.
Risk	<ul style="list-style-type: none"> o Likelihood of achieving the predicted outcomes (scoring against the objectives) o reliance on other budgets o the extent to which it's been done before in NZ 	Low	Medium	Medium	High	High
		Highly reliant on LGWM infrastructure improvements being delivered, targeted interventions in targeted places and as improvements are delivered. These initiatives have been implemented in NZ previously which reduces risk. But will doing more of BAU be enough to achieve the project objectives? Could fall short.	Same risks as Package A + First last leg schemes potentially have a high cost and will be new to the region if they take the form of on-demand or shared mobility schemes (as opposed to walk/ cycle and maybe subsidised shared ubers/ shared taxis).	Same risks as Package A and B + This package includes addressing driving and parking which ensures objectives are met, but it relies on the parking levy to be implemented which increases risk. Addressing the appeal of driving and parking can be contentious and may not be implemented to the extent required (by workplaces), or could take years to realise full effect.	Same risks as Package A, B & C + This package employs new to NZ approaches, the evidence suggests these measures will work. Pilot, test and grow approach allows for trialling (in NZ) before rolling out resulting in lower risk. Regardless of other budgets, localised initiatives can still be implemented to prime people for when improvements are made. This approach has not been adopted at this scale in NZ before-potential skill gap.	Same risks as Package A, B, C & D Region-wide rollout means high risk if things do not work.
	SUBTOTAL	13	15	18	24	26
Cost / resource	low	See Section Error! Reference source not found. Error! Reference source not found.				
	expected					
	Full time equivalents	14	15	16	20	22

Appendix J: Appraisal Summary Table

Appraisal Summary Table Template

Date: 27/04/2022	Evaluation Period: (baseline and forecast year) e.g 2020 - 2060 2021-2031	Option Name: Recommended Package - Package E	This is the preferred option <input checked="" type="checkbox"/>
Problem/opportunity statement: Wellington frequently ranks highly as a liveable city in comparison to major centres throughout Australasia. Its population is growing. One of the consequences of this growth is increasing pressure on the transport system which is already at capacity during peak times. Traffic congestion is a regular occurrence, indicating that the transport network is unable to support current or expected growth in travel demand. Bus service efficiency and reliability is significantly affected by this congestion, especially during peak periods. In addition, there will be localised disruption during the Let's Get Wellington Moving (LGWM) programme construction phase. Growth in numbers of people entering the CBD by car will negatively impact the region's liveability. This risks undermining the LGWM vision for a great harbour city, accessible to all, with attractive places, shared streets, and efficient local and regional journeys through moving more people with fewer vehicles. Ultimately the LGWM programme is seeking to support a changed urban form by changing the transport system so that it can "move more people using fewer vehicles". LGWM is focused on trips entering or passing through the central city, many of which start or end in the wider region outside Wellington City.	Investment objectives: A. improve access to and through the central city ensuring people know that the available travel choices will work for them. B. minimise disruption to people and business by making sure they are aware of upcoming changes, how it will affect their journeys and understand their travel options during delivery of work to improve and renew the city. C. make best use of the transport network by encouraging people to travel less often and at less busy times. D. make best use of the available transport options by reducing the proportion of people that drive alone during busy times + or for short trips. E. improve the health, safety and wellbeing of communities by increasing the number of trips that involve active modes and public transport.	How project gives effect to GPS: Actions three of the four strategic priorities: - Improved climate change outcomes - Improved safety - Better travel options	How project gives effect to local community outcomes: According to community engagement findings, Wellingtonians value the environment. They feel more emphasis on active transport will promote healthy lifestyles and reduce carbon emissions. The other LGWM packages of work will create a more supportive built environment for walking and cycling and will work alongside the TBC package which will help reduce traffic, congestion and the impact of transport related emissions. These workstreams will also help remove real and perceived barriers to choosing sustainable transport options. Additionally, the TBC package can assist with optimising public transport services by reducing demand during peak times and encouraging even more people to use these services once public transport improvements are complete.

1. Summary of Non-Monetised Impacts (Description)	2. Summary of Financial Impacts (nominal, non-discounted)	3. Summary of Monetised Option Impacts (present value, discounted)	
Travel behaviour change initiatives will help Wellington get the most out of the existing transport network and get the most from planned improvements. Historically travel behaviour change initiatives have provided better value for money than many infrastructure improvements. One of the strategic approaches underpinning the LGWM programme is making the most of what we have. Other non-monetised benefits of the TBC package include a reduction in noise pollution, relief from overcrowding on public transport especially during peak periods, improved road user safety, reduced maintenance and operating costs as a result of changed travel patterns and an improvement in economic activity as a result of increased foot/cycle traffic.	Capital Costs	\$62.3 million	
	Operating Costs	\$5.92 million	
	Total Financial Costs	\$68.22 million	
	Total Monetised Benefits, <u>excluding</u> cost of PT Fare Incentive	\$29.3 million	
		Total Monetised Benefits, <u>including</u> cost of PT Fare Incentive	\$41.3 million
		Total Monetised Benefits (costs)	\$168.4 million
		BCR (excluding cost of PT Fare Incentive)	5.7
		BCR (including cost of PT Fare Incentive)	4.1

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: (description in dollar terms in real terms, non-discounted)	
	Name of Measure:	Baseline:	Do Minimum Impact:	Option Impact:	Do Minimum Impact:

Healthy and safe people

1.1 Impact on social cost and incidents of crashes	1.1.4 Personal risk (crash rate)	N/A	Negative impact as fewer people on foot and bikes means people are less aware of their presence.	Positive impact as seeing more people on foot and on bikes will make drivers more aware of their presence, reducing the incidence of collision. Positive impact likely from people switching from driving to walking and cycling creating a safer road environment.	N/A	The user safety benefits \$306,862. The crash cost benefits are from the reduced traffic exposure on mid-blocks when a user switches to walking and public transport.
3.1 Impact of mode on physical and mental health	3.1.1 Physical health benefits from active modes	N/A	Negative impact as sedentary lifestyles / lack of movement can lead to physical health issues and social isolation.	Positive impact, as the recommended package will divert from driving approx. 3000 people to using PT, 700 to cycling and nearly 2000 people to walking. Increased movement as a result of moving on foot, bikes and PT will also lead to positive physical health benefits.	N/A	The health benefits when a user switches mode to walking and cycling can be quantified to a monetisable benefit of \$3,494,194
2.1 Impact on perceptions of safety and security	2.1.1 Access - perception	N/A	N/A	Reduced crowding on public transport will lead to improved user perception exp due to covid related concerns. Shifting people to walking and cycling will further help alleviate health concerns.	N/A	N/A

Resilience and security

4.1 Impact on system vulnerabilities and redundancies	2.1.1 Access - perception	NA	Negative impact as people might think they are unable to access places if they are unable to drive due to disruption caused by natural events or planned improvements.	Positive impact as a result of making people aware of alternative ways of accessing social and economic opportunities.	N/A	N/A
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Economic prosperity

6.1 Wider economic benefit (productivity)	10.2.9 Pricing - more efficient	N/A	Negative impacts as car travel is not the most productive use of the existing and planned infrastructure.	Walking, cycling and using PT can provide cheaper options for getting around. These modes make better use of existing and planned infrastructure and therefore provide better value for money.	N/A	The car travel time cost savings are \$5,225,095. The operating cost of vehicles depends upon the distance and time spent travelling. This will include benefits for diverted trips that no longer occur and those who remain in the same mode.
5.2 Impact on network productivity and utilisation	10.1.9 Travel time	N/A	Additional capacity created through infrastructure improvements will create more capacity but with minimal travel behaviour change effort, the mode shift away from car driving will not meet the set targets for Wellington.	Shifting people from PT to walking and cycling where there are capacity constraints especially during peak times; and to PT, walking and cycling where the road capacity is constrained can help create more capacity and enable the network to move more people in fewer vehicles.	N/A	The decongestion benefits are \$11,933,720. The car travel time benefits (or cost) relates to the value of reduced (or increased) vehicle travel times for car users due to decongestion benefits. that remain on the network.

Environmental sustainability

8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	N/A	People continuing to drive will lead to negative impacts on green house gas emissions.	Positive impact as shifting people to environmentally friendly modes will contribute to reduced greenhouse gas emissions	N/A	Vehicle emission reduction benefits equate to \$209,004. The emission benefit from vehicle travel refers to reduced (or increased) vehicle emissions mode shift to walking and cycling.
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Inclusive access

12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	N/A	N/A	N/A	N/A	N/A
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10.1 Impact on user experience of the transport system	10.1.1 People - throughput of pedestrians, cyclists and public transport boardings	N/A	Added capacity from infrastructure improvements will enable more people to use the network but pinch points from disruption will create negative impacts for users.	Relief from overcrowding on public transport especially during peak periods will also have a positive impact on user experience	N/A	N/A
10.2 Impact on mode choice	10.2.1 People - mode share	N/A	Some positive impact with increased awareness of travel options in selected workplaces and schools.	More people being aware of their travel choices can lead to increased mode choice.	N/A	N/A
10.4 Impact on community cohesion	10.4.1 Social connectedness	N/A	N/A	More people moving on foot, bikes and PT means increased chance of chance encounters with people in the community and neighbourhood leading to community cohesion.	N/A	N/A

Rationale for option selection decision

Following evaluation of the five packages and input from the Technical Working Group, agreement was reached that the recommended package should take the form of a staged delivery, sequenced to align with the delivery the LGWM programme infrastructure improvements, building from Package A up to Package E over time. Any new or more innovative approaches such as the ripple effect and culture change initiatives/tools inside D and E, could be delivered by piloting, testing and growing/refining both to build confidence and an evidence base to justify scaling them up.

Each of the alternative packages deliver on the project objectives to varying degrees over 10 years. Packages A, B and C are particularly focused on delivering against the project investment objectives. Packages D and E go further, delivering regional benefits by investing in ripple effect initiatives to enable a long-term sustained culture to shift away from car driving. They accelerate culture change and create new social norms around all types of trips, not just commuting. Their intention is to create preparedness and to reach people early (eg reaching children not just through programmes focused on schools but also in their neighbourhoods), thereby creating opportunities for travel behaviour change in all aspects of life. Perhaps most importantly, by boldly tackling the entire city's travel behaviour, packages D and E can enable systemic culture change making regression (ie going back to the car) post disruption less likely.

Appendix K: Economics Summary

Travel Behaviour Change - Overview and Guidance

General Information

limitation of usage

Designed for the **evaluation of economic efficiency** of LGWM TDM packages. The following assumptions apply:

- the procedure assumes cumulative benefits for TBhC activities (marketing, education, travel plans etc.), excludes benefits for first-last leg investment at present
- the evaluation period is 10 years
- the procedure assumes that benefits will be realised in year three
- the procedure is responsive to target population and diversion rates from the MBCM
- the procedure is typical used for individual travel plans rather than a collective regional wide study, this could result in double counting of diverted trips
- the procedure assumes that all trips are diverted to other modes (however some may not happen i.e. working from home)

Step 1: Define Target Population

Step 2: Collect data to assess travel impacts

- Target population
- Modal share
- level of diversion
- WTSM travel time and travel distance

Step 3: Measure and monetise the impacts (benefits and disbenefits for the do-minimum)

- impact on social cost and incidence of crashes
- impact of mode of physical and mental health
- impact on system reliability
- impact on network productivity and utilisation
- impact on greenhouse gas emissions

Step 4:

- calculate benefits for Wider Wellington
- calculate benefits for disruption
- calculate benefits for Parking Levy

Step 5: Net Present Value Calculation and Sensitivity Test

Worksheet Completion Steps:

Step 1: Complete 'Package Calculation Tab' to obtain target population and diversion rate for each package

Step 2: Calculate benefits using MCBM procedure

Step 3: Enter package capital and operational costs

Step 4: Calculate BCR and sensitivity tests

Package D (Extra Over Package C)

Category	Location	Target Population	Diversion Rate	Comments
Policy Partnership and Advocacy (The same for all Packages)				
Travel Plans				
Develop programmes for Schools (large schools)	Wellington Wide	29,498	9%	
Organisation travel plans (workplace travel plans) Assume 20% of employment in eastern suburbs	Eastern Suburbs	2,260	5%	
Community travel plans (380 homes, average of 2.6 people per house)	Central Wellington	988	3%	
Event travel plans	Central Wellington	-	-	
Events, experiences and life				
Marketing, Communication, Incentives				
Supporting Services				
Supporting Services				
Evaluation, Research and Report				

Package E (Extra Over Package D)

Category	Location	Target Population	Diversion Rate	Comments
Policy Partnership and Advocacy (The same for all Packages)				
Travel Plans				
Develop programmes for Schools (all schools)	Wellington Wide	80,085	9%	
Tertiary institutes	Kapiti Coast & Porirua, Hutt Valley & Wairarapa	10,380	9%	
Organisation travel plans (workplace travel plans)	Northern, Eastern, Southern Suburbs, Kapiti Coast & Porirua, Hutt Valley & Wairarapa	-	-	
Community travel plans (Karori)	Western Suburbs	9,660	3%	
Events, experiences and life				
Change work or home location to reduce commute length		-	-	
Marketing, Communication, Incentives				
Targetted social marketing campaign	Upper Hutt, Lower Hutt; Porirua; Tawa, Johnsonville	294,354	1%	
Challenges, competitions and recognition	Wellington wide			
Supporting Services				
Supporting Services				
Evaluation, Research and Report				

Assumptions

1. Proportion of workforce targetted

	Wellington City (2018) (%)	National Sector > 100 Employees (%)	Target Population
Total Employment			
Agriculture & Mining	0.3		
Construction	5.1	15	0.8
Education & Health	15.5	45	7.0
Entertainment & Food	6.6	10	0.7
Finance & Insurance	6.1	45	2.7
Government	18.6	67	12.5
Information Services	3.9	52	2.0
Manufacturing	2.6		
Armed Forces	0		
Professional Services	22.1	32	7.1
Other Services	4.9		
Retail Trade	8.6	23	2.0
Transportation	3.5		
Wholesale Trade	2.3		
Total	100.1		33.9
	105300		35,718

Monetised Benefits and Costs Manual Method
Forecasting Diversion

Step 1: Workplace Target Population (refer to Target Population Tab for inputs)

Part A: Select diversion rates (this calculation uses MBCM Table 5, Table 6, Table 7)

EEM Diversion Rates

Workplace		Score	Reduction in car as Car as passenger	Public Transpo	Cycling	Walking	
Standard	Low	SL	0%	0%	0%	0%	0%
	Medium	SM	-5%	26%	26%	12%	36%
Alternative	Low	AL	0%	0%	0%	0%	0%
	Medium	AM	-5%	26%	52%	6%	16%
	Medium (Other	AM (Other)	-5%	26%	74%	0%	0%
	High (Parking)	AH (Parking)	-7%	26%	57%	8%	9%
	High (Parking	AH (Parking/Other)	-7%	26%	74%	0%	0%
	High (Other)	AH (Other)	-13%	26%	74%	0%	0%
	High	AH	-13%	26%	57%	8%	9%
School							
School type	Primary	SP	0%	-9%	0%	17%	83%
	Secondary/int	SS	0%	-9%	55%	6%	39%
Community							
Low	CL		-1%	-0.2%	42%	25%	33%
Standard	CS		-3%	-0.5%	39%	25%	36%

We have created this diversion rate
We have created this diversion rate
We have created this diversion rate
We have created this diversion rate

Part B: Calculate mode share by region and trip type

Assumes: Workplace: Journey to work data
Education: Journey to education data
Community: Journey to work data (excluding trips to Wellington Central)

Base Mode Share - To Central Wellington

	Car as Driver	Car as Passenger	Public Transpor	Cycling	Walking	
Central Wellington (LGWM area an	5%		8%	1%	86%	100%
Northern suburbs (Tawa, Johnsonv	50%		47%	3%	0%	100%
Eastern suburbs (Seatoun, Mirama	39%		44%	8%	9%	100%
Southern suburbs (Island Bay, New	24%		36%	8%	32%	100%
Western suburbs (Karori, Wadesto	34%		32%	5%	29%	100%
Porirua and Kapiti Coast	57%		43%	0%	0%	100%
Hutt Valley and Wairarapa	49%		49%	2%	0%	100%

Base Mode Share - Education

	Car as Driver	Car as Passenger	Public Transpor	Cycling	Walking	
Central Wellington (LGWM area an	23%		42%	1%	34%	100%
Northern suburbs (Tawa, Johnsonv	48%		15%	1%	36%	100%
Eastern suburbs (Seatoun, Mirama	42%		23%	5%	30%	100%
Southern suburbs (Island Bay, New	26%		31%	2%	40%	100%
Western suburbs (Karori, Wadesto	21%		31%	1%	47%	100%
Porirua and Kapiti Coast	59%		11%	6%	24%	100%
Hutt Valley and Wairarapa	56%		20%	3%	21%	100%

Base Mode Share - Suburb Specific (Community Activites)

	Car as Driver	Car as Passenger	Public Transpor	Cycling	Walking	
Central Wellington (LGWM area an	28%		14%	0%	58%	100%
Northern suburbs (Tawa, Johnsonv	86%		1%	0%	12%	100%
Eastern suburbs (Seatoun, Mirama	77%		3%	1%	19%	100%
Southern suburbs (Island Bay, New	61%		6%	1%	32%	100%
Western suburbs (Karori, Wadesto	69%		6%	0%	25%	100%
Porirua and Kapiti Coast	88%		6%	2%	4%	100%
Hutt Valley and Wairarapa	86%		7%	2%	5%	100%

Population and Trip Data

	Population (2018)	Employment (2018)	Employment (CBD)	Percent of Wellington Populaton
Central Wellington (LGWM area	46,600	105,300	10,142	22%
Northern suburbs (Tawa, Johns	67,800	17,200	17,712	32%
Eastern suburbs (Seatoun, Mira	38,100	11,300	9,363	18%
Southern suburbs (Island Bay, h	31,400	4,900	15,635	15%
Western suburbs (Karori, Wade	28,000	6,700	12,818	13%
Porirua and Kapiti Coast	112,900	31,600	15,463	36%
Hutt Valley and Wairarapa	197,600	74,000	24,166	64%
	211,900		105,300	

Population and Trip Data

	Primary School (201	Private School (201	Intermediate / Secc Tertiary (2018)	
Central Wellington (LGWM area	2796	937	6409	5,507
Northern suburbs (Tawa, Johns	4335	147	5205	8,013
Eastern suburbs (Seatoun, Mira	3749	857	2220	4,503
Southern suburbs (Island Bay, h	2563		2302	3,711
Western suburbs (Karori, Wade	3700	487	0	3,309
Porirua and Kapiti Coast	12033		6409	3,774
Hutt Valley and Wairarapa	18422		15559	6,606
	47598		38104	

Assuming Tertiary students are distributed similarly to the population of Wellington

LGWM Indicative Business Case Growth Assumptions

Region	Population (2018 – 2036)		Employment (2018 – 2036)		New Employment in Central Wellington	
	Abs Growth	% Growth	Abs Growth	% Growth	Home Location	Wellington
Central Wellington	12,800	26%	18,300	17%	Central Wellington	5,100
Northern suburbs	10,500	16%	2,300	14%	Northern suburbs	3,200
Eastern suburbs	2,300	6%	1,500	13%	Eastern suburbs	1,200
Southern suburbs	2,800	8%	200	4%	Southern suburb	1,600
Western suburbs	1,100	4%	600	14%	Western suburb	800
Porirua and Kapiti	27,900	24%	4,700	13%	Porirua and Kap	4,800
Hutt Valley and W	15,200	8%	4,900	7%	Hutt Valley and	1,600
Region	75,200	14%	55,400	14%	Total	18,300

Part C: Calculate total population and trip data, and total employment that c
 Part D: Calculate package target audience = total population x private vehicle mode share (x reach)
 Diversion rate have been assigned based on MBCM rates and those achieved in the critical review (see Diversion Review Tab for more information)

Workplace Package TDM Scoring

Package	Area From	Area To	Total Target Popul	Diversion Rate	Reduction in car				
					as driver	Car as passenger	Public Transport	Cycling	Walking
Package A	Central Wellington (I	Central Wellington	155	AM	-8	2	4	0	1
	Northern suburbs (T	Central Wellington	3,017	AM (Other)	-151	39	112	0	0
	Eastern suburbs (Se	Central Wellington	1,227	AM	-61	16	32	4	10
	Southern suburbs (I	Central Wellington	1,259	AM	-63	16	33	4	10
	Western suburbs (K	Central Wellington	1,476	AM	-74	19	38	4	12
	Porirua and Kapiti C	Central Wellington	2,987	AM (Other)	-149	39	111	0	0
	Hutt Valley and Wair	Central Wellington	4,000	AM (Other)	-200	52	148	0	0
Package B	Central Wellington (I	Central Wellington	155	AM	-8	2	4	0	1
	Northern suburbs (T	Central Wellington	3,017	AM (Other)	-151	39	112	0	0
	Eastern suburbs (Se	Central Wellington	1,227	AM	-61	16	32	4	10
	Southern suburbs (I	Central Wellington	1,259	AM	-63	16	33	4	10
	Western suburbs (K	Central Wellington	1,476	AM	-74	19	38	4	12
	Porirua and Kapiti C	Central Wellington	2,987	AH (Other)	-385	100	285	0	0
	Hutt Valley and Wair	Central Wellington	4,000	AH (Other)	-516	134	382	0	0
Package C	Central Wellington (I	Central Wellington	159	AH (Parking)	-11	3	6	1	1
	Northern suburbs (T	Central Wellington	3,085	AH (Parking/O	-216	56	160	0	0
	Eastern suburbs (Se	Central Wellington	1,255	AH (Parking)	-88	23	50	7	8
	Southern suburbs (I	Central Wellington	1,287	AH (Parking)	-90	23	51	7	8
	Western suburbs (K	Central Wellington	1,509	AH (Parking)	-106	27	60	8	10
	Porirua and Kapiti C	Central Wellington	3,054	AH (Other)	-394	102	292	0	0
	Hutt Valley and Wair	Central Wellington	4,090	AH (Other)	-528	137	390	0	0
Package D	Central Wellington (I	Central Wellington	169	AH (Parking)	-12	3	7	1	1
	Northern suburbs (T	Central Wellington	3,291	AH (Parking/O	-230	60	170	0	0
	Eastern suburbs (Se	Central Wellington	1,339	AH (Parking)	-94	24	53	7	8
	Southern suburbs (I	Central Wellington	1,373	AH (Parking)	-96	25	55	8	9
	Western suburbs (K	Central Wellington	1,610	AH (Parking)	-113	29	64	9	10
	Porirua and Kapiti C	Central Wellington	3,258	AH (Other)	-420	109	311	0	0
	Hutt Valley and Wair	Central Wellington	4,363	AH (Other)	-563	146	416	0	0
Package E	Central Wellington (I	Central Wellington	169	AH (Parking)	-12	3	7	1	1
	Northern suburbs (T	Central Wellington	3,291	AH (Parking/O	-230	60	170	0	0
	Eastern suburbs (Se	Central Wellington	1,339	AH (Parking)	-94	24	53	7	8
	Southern suburbs (I	Central Wellington	1,373	AH (Parking)	-96	25	55	8	9
	Western suburbs (K	Central Wellington	1,610	AH (Parking)	-113	29	64	9	10
	Porirua and Kapiti C	Central Wellington	3,258	AH (Other)	-420	109	311	0	0
	Hutt Valley and Wair	Central Wellington	4,363	AH (Other)	-563	146	416	0	0
Package C - B	Central Wellington (I	Central Wellington	159	AH (Parking)	-11	3	6	1	1
	Northern suburbs (T	Central Wellington	3,085	AH (Parking/O	-216	56	160	0	0
	Eastern suburbs (Se	Central Wellington	1,255	AH (Parking)	-88	23	50	7	8
	Southern suburbs (I	Central Wellington	1,287	AH (Parking)	-90	23	51	7	8
	Western suburbs (K	Central Wellington	1,509	AH (Parking)	-106	27	60	8	10
	Porirua and Kapiti C	Central Wellington	3,054	AH (Parking/O	-214	56	158	0	0
	Hutt Valley and Wair	Central Wellington	4,090	AH (Parking/O	-286	74	212	0	0

School Package TDM Scoring

Primary

Package	Area	Total Target Popul	Diversion Rate	Reduction in car				
				as driver	Car as passenger	Public Transport	Cycling	Walking
Package A	Central Wellington (I	0		0	0	0	0	0
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wair	0		0	0	0	0	0
Package B	Central Wellington (I	0		0	0	0	0	0
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wair	0		0	0	0	0	0
Package C	Central Wellington (I	0		0	0	0	0	0
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wair	0		0	0	0	0	0
Package D	Central Wellington (I	634	SP	0	-57	0	10	47
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wair	0		0	0	0	0	
Package E	Central Wellington (I	634	SP	0	-57	0	10	47
	Northern suburbs (T	2063	SP	0	-186	0	32	154
	Eastern suburbs (Se	1580	SP	0	-142	0	24	118
	Southern suburbs (I	678	SP	0	-61	0	10	51
	Western suburbs (K	781	SP	0	-70	0	12	58
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wair	0		0	0	0	0	

Reach **Target Age 20-69** 69% <https://forecast.idnz.co.nz/wellington/population-age-structure>

Community (Marketing, Communication, Incentives)

Package	Area	Total Target Popul	Diversion Rate	Reduction in				
				car as driver	Car as passenger	Public Transport	Cycling	Walking
Package A	Central Wellington	32,340	CL	-323	-65	163	97	128
	Northern suburbs (	0		0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-264	-53	133	79	105
	Southern suburbs (	21,792	CL	-218	-44	110	65	86
	Western suburbs (I	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	0
Package B	Central Wellington	32,340	CL	-323	-65	163	97	128
	Northern suburbs (	0		0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-264	-53	133	79	105
	Southern suburbs (	21,792	CL	-218	-44	110	65	86
	Western suburbs (I	0		0	0	0	0	0
	Porirua and Kapiti C	15,463	CL	-155	-31	78	46	61
	Hutt Valley and Wa	24,166	CL	-242	-48	122	72	96
Package C	Central Wellington	32,340	CL	-323	-65	163	97	128
	Northern suburbs (	0		0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-264	-53	133	79	105
	Southern suburbs (	21,792	CL	-218	-44	110	65	86
	Western suburbs (I	0		0	0	0	0	0
	Porirua and Kapiti C	15,463	CL	-155	-31	78	46	61
	Hutt Valley and Wa	24,166	CL	-242	-48	122	72	96
Package D	Central Wellington	32,340	CL	-323	-65	163	97	128
	Northern suburbs (	0		0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-264	-53	133	79	105
	Southern suburbs (	21,792	CL	-218	-44	110	65	86
	Western suburbs (I	0		0	0	0	0	0
	Porirua and Kapiti C	15,463	CL	-155	-31	78	46	61
	Hutt Valley and Wa	24,166	CL	-242	-48	122	72	96
Package E	Central Wellington	32,340	CL	-323	-65	163	97	128
	Northern suburbs (	0		0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-264	-53	133	79	105
	Southern suburbs (	21,792	CL	-218	-44	110	65	86
	Western suburbs (I	9,716	CS	-301	-49	136	87	126
	Porirua and Kapiti C	15,463	CL	-155	-31	78	46	61
	Hutt Valley and Wa	24,166	CL	-242	-48	122	72	96

Karori Travel Plan

Intermediate/ Secondary/Tertiary

Package	Area	Total Target Population	Reduction in					
			car as driver	Car as passenger	Public Transport	Cycling	Walking	
Package A	Central Wellington	1462	SS	0	-132	72	8	51
	Northern suburbs (	3884	SS	0	-350	192	21	136
	Eastern suburbs (S	2259	SS	0	-203	112	12	79
	Southern suburbs (	981	SS	0	-88	49	5	34
	Western suburbs (I	802	SS	0	-72	40	4	28
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	
Package B	Central Wellington	1462	SS	0	-132	72	8	51
	Northern suburbs (	3884	SS	0	-350	192	21	136
	Eastern suburbs (S	2259	SS	0	-203	112	12	79
	Southern suburbs (	981	SS	0	-88	49	5	34
	Western suburbs (I	802	SS	0	-72	40	4	28
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	
Package C	Central Wellington	1462	SS	0	-132	72	8	51
	Northern suburbs (	3884	SS	0	-350	192	21	136
	Eastern suburbs (S	2259	SS	0	-203	112	12	79
	Southern suburbs (	981	SS	0	-88	49	5	34
	Western suburbs (I	802	SS	0	-72	40	4	28
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	
Package D	Central Wellington	2916	SS	0	-262	144	16	102
	Northern suburbs (	6362	SS	0	-573	315	34	223
	Eastern suburbs (S	3194	SS	0	-287	158	17	112
	Southern suburbs (	1590	SS	0	-143	79	9	56
	Western suburbs (I	802	SS	0	-72	40	4	28
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	
Package E	Central Wellington	2916	SS	0	-262	144	16	102
	Northern suburbs (	6362	SS	0	-573	315	34	223
	Eastern suburbs (S	3194	SS	0	-287	158	17	112
	Southern suburbs (	1590	SS	0	-143	79	9	56
	Western suburbs (I	802	SS	0	-72	40	4	28
	Porirua and Kapiti C	0		0	0	0	0	0
	Hutt Valley and Wa	0		0	0	0	0	

Summary of Reach and Diversion

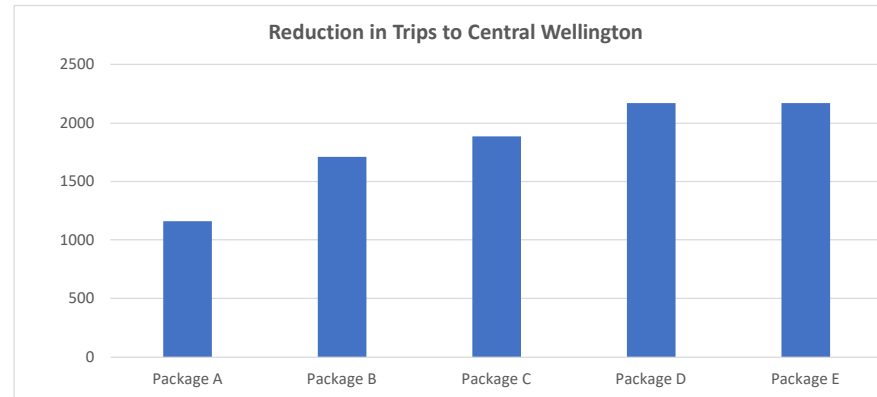
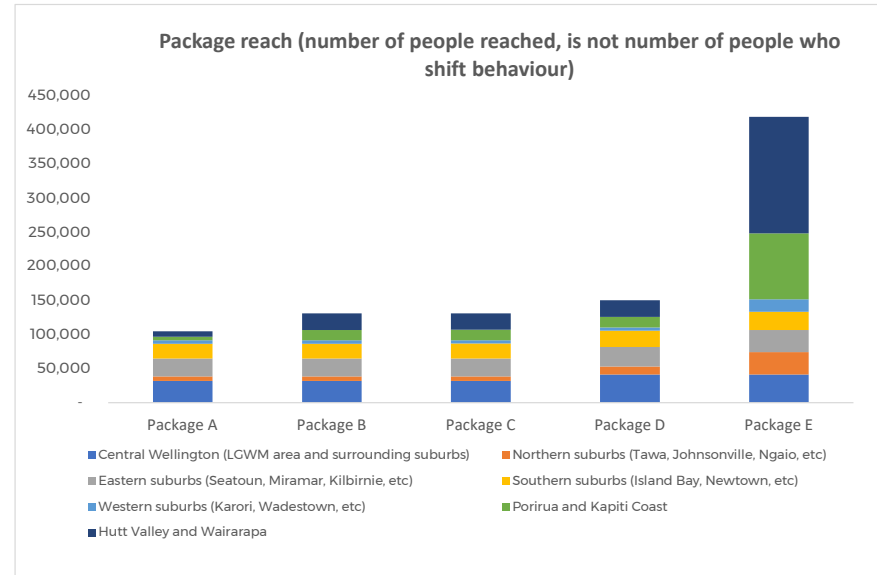
Estimated Package Reach

	Package A	Package B	Package C	Package D	Package E
Central Wellington (LGWM area and surrounding suburbs)	32,340	32,340	32,340	41,545	41,545
Northern suburbs (Tawa, Johnsonville, Ngaio, etc)	6,155	6,155	6,290	11,495	33,030
Eastern suburbs (Seatoun, Miramar, Kilbirnie, etc)	26,441	26,441	26,441	28,661	32,410
Southern suburbs (Island Bay, Newtown, etc)	21,792	21,792	21,792	24,094	26,657
Western suburbs (Karori, Wadestown, etc)	4,835	4,835	4,933	4,933	18,293
Porirua and Kapiti Coast	5,245	15,463	15,463	15,463	96,795
Hutt Valley and Wairarapa	8,197	24,166	24,166	24,166	171,115
	105,005	131,193	131,426	150,358	419,846

Estimated Package Diversion

Total Number of trips diverted to Central Wellington

	Reduction in SOV	Rideshare	Public Transport	Cycling	Walking
Package A	1161	184	685	101	191
Package B	1713	327	1094	101	191
Package C	1887	372	1218	112	184
Package D	2171	397	1357	131	285
Package E	2171	397	1357	131	285



Monetised Benefits and Costs Manual Method
WTSM Outputs

Sector 1 = CBD

Sector 2 = Eastern Suburbs

Sector 3 = Southern Suburbs

Sector 4 = Western Suburbs

Sector 5 = Northern Suburbs

Sector 6 = Rest of Region

AM - Person trips

	No TDM	Medium	High	% Change - Med	% Change - High
To / from / within 1	34043	33060	31869	-2.9%	-6.4%
To / from / within 2	15237	15195	15066	-0.3%	-1.1%
To / from / within 3	18555	18443	18298	-0.6%	-1.4%
To / from / within 4	8894	8959	8695	0.7%	-2.2%
To / from / within 5	21072	20968	20870	-0.5%	-1.0%
To / from / within 6	143052	142852	142682	-0.1%	-0.3%
Total	240852	239476	237480	-0.6%	-1.4%
	1376	1996			

AM - Change in VKT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	139894	138502	136414	-1.0%	-2.5%
Within 2	54247	53478	52998	-1.4%	-2.3%
Within 3	49370	49028	48207	-0.7%	-2.4%
Within 4	28243	28266	26805	0.1%	-5.1%
Within 5	212206	210615	208017	-0.8%	-2.0%
Within 6	1144192	1139270	1133572	-0.4%	-0.9%
Total	1628152	1619159	1606013	-0.6%	-1.4%

AM - Change in VHT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	5875	5558	5212	-5.4%	-11.3%
Within 2	1953	1910	1848	-2.2%	-5.4%
Within 3	1973	1944	1875	-1.5%	-5.0%
Within 4	1018	1011	899	-0.7%	-11.7%
Within 5	5246	4796	4372	-8.6%	-16.7%
Within 6	23172	22915	22597	-1.1%	-2.5%
Total	39237	38133	36803	-2.8%	-6.2%

IP - Person trips

	No TDM	Medium	High	% Change - Med	% Change - High
To / from / within 1	118277	117426	116488	-0.7%	-1.5%
To / from / within 2	53773	53824	53675	0.1%	-0.2%
To / from / within 3	60956	60919	60789	-0.1%	-0.3%
To / from / within 4	29965	30067	29837	0.3%	-0.4%
To / from / within 5	72080	72034	71982	-0.1%	-0.1%
To / from / within 6	522234	522025	521930	0.0%	-0.1%
Total	857284	856294	854701	-0.1%	-0.3%

ip - Change in VKT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	112760	112990	113047	0.2%	0.3%
Within 2	44643	44659	44658	0.0%	0.0%
Within 3	38635	38640	38516	0.0%	-0.3%
Within 4	21228	21300	21074	0.3%	-0.7%
Within 5	144053	144763	145227	0.5%	0.8%
Within 6	840603	840641	841088	0.0%	0.1%
Total	1201923	1202994	1203610	0.1%	0.1%

IP - Change in VHT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	4117	4150	4118	0.8%	0.0%
Within 2	1250	1251	1251	0.1%	0.1%
Within 3	1290	1291	1286	0.0%	-0.3%
Within 4	640	642	635	0.3%	-0.8%
Within 5	2336	2349	2357	0.6%	0.9%
Within 6	15027	15026	15036	0.0%	0.1%
Total	24660	24708	24682	0.2%	0.1%

PM - Person trips

	No TDM	Medium	High	% Change - Med	% Change - High
To / from / within 1	43599	42965	42171	-1.5%	-3.3%
To / from / within 2	22747	22751	22648	0.0%	-0.4%
To / from / within 3	26785	26750	26653	-0.1%	-0.5%
To / from / within 4	13505	13580	13396	0.6%	-0.8%
To / from / within 5	31755	31691	31625	-0.2%	-0.4%
To / from / within 6	221556	221380	221110	-0.1%	-0.2%
Total	359948	359117	357602	-0.2%	-0.7%

PM - Change in VKT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	166937	165086	162460	-1.1%	-2.7%
Within 2	57504	57368	57107	-0.2%	-0.7%
Within 3	55041	54827	54231	-0.4%	-1.5%
Within 4	30474	30506	29612	0.1%	-2.8%
Within 5	223384	222729	221014	-0.3%	-1.1%
Within 6	1218820	1216513	1211834	-0.2%	-0.6%
Total	1752160	1747030	1736258	-0.3%	-0.9%

PM - Change in VHT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	7585	7286	6923	-3.9%	-8.7%
Within 2	2004	2008	1994	0.2%	-0.5%
Within 3	2299	2285	2244	-0.6%	-2.4%
Within 4	1060	1059	1017	-0.1%	-4.0%
Within 5	6389	6295	6085	-1.5%	-4.8%
Within 6	24226	24252	24195	0.1%	-0.1%
Total	43563	43185	42459	-0.9%	-2.5%

Daily Person trips

	No TDM	Medium	High	% Change - Med	% Change - High
To / from / within 1	219574	216935	213826	-1.2%	-2.6%
To / from / within 2	102512	102535	102124	0.0%	-0.4%
To / from / within 3	118488	118295	117898	-0.2%	-0.5%
To / from / within 4	58357	58619	57895	0.5%	-0.8%
To / from / within 5	139322	139100	138874	-0.2%	-0.3%
To / from / within 6	991289	990662	990108	-0.1%	-0.1%
Total	1629541	1626146	1620724	-0.2%	-0.5%

Daily - Change in VKT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	870631	868539	864109	-0.2%	-0.7%
Within 2	334965	334140	333396	-0.2%	-0.5%
Within 3	297587	297057	295019	-0.2%	-0.9%
Within 4	164859	165273	161786	0.3%	-1.9%
Within 5	1155858	1157160	1155168	0.1%	-0.1%
Within 6	6566029	6558990	6550846	-0.1%	-0.2%
Total	9389927	9381158	9360323	-0.1%	-0.3%

Daily - Change in VHT

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	34047	33597	32723	-1.3%	-3.9%
Within 2	10207	10171	10095	-0.4%	-1.1%
Within 3	10722	10681	10549	-0.4%	-1.6%
Within 4	5276	5279	5089	0.1%	-3.5%
Within 5	23316	22836	22243	-2.1%	-4.6%
Within 6	122534	122296	121973	-0.2%	-0.5%
Total	206101	204858	202671	-0.6%	-1.7%

Monetised Benefits and Costs Manual Method
WTSM Calculation per person

AM - Change in Speed

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	24	25	26	4.6%	9.9%
Within 2	28	28	29	0.8%	3.2%
Within 3	25	25	26	0.8%	2.8%
Within 4	28	28	30	0.8%	7.5%
Within 5	40	44	48	8.6%	17.6%
Within 6	49	50	50	0.7%	1.6%
Total	41.5	42.5	43.6	2.3%	5.2%

Calculations

AM - VKT per person

	No TDM	Medium	High
Within 1	4.1	4.2	4.3
Within 2	3.6	3.5	3.5
Within 3	2.7	2.7	2.6
Within 4	3.2	3.2	3.1
Within 5	10.1	10.0	10.0
Within 6	8.0	8.0	7.9
Total	6.76	6.76	6.76

Calculations

AM - VHT per person

	No TDM	Medium	High
Within 1	0.173	0.168	0.164
Within 2	0.128	0.126	0.123
Within 3	0.106	0.105	0.102
Within 4	0.114	0.113	0.103
Within 5	0.249	0.229	0.209
Within 6	0.162	0.160	0.158
Total	0.16	0.16	0.15

Calculations

AM - VHT per person removed

	No TDM	Medium	High
Within 1		0.154	0.128
Within 2		0.913	0.352
Within 3		0.155	0.374
Within 4		-0.220	0.319
Within 5		4.105	4.136
Within 6		1.124	1.713
Total		0.643	0.511

IP - Change in Speed

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	27	27	27	-0.6%	0.3%
Within 2	36	36	36	0.0%	0.0%
Within 3	30	30	30	0.0%	0.0%
Within 4	33	33	33	0.0%	0.1%
Within 5	62	62	62	-0.1%	-0.1%
Within 6	56	56	56	0.0%	0.0%
Total	49	49	49	-0.1%	0.1%

IP - VKT per person

	No TDM	Medium	High
Within 1	0.95	0.96	0.97
Within 2	0.83	0.83	0.83
Within 3	0.63	0.63	0.63
Within 4	0.71	0.71	0.71
Within 5	2.00	2.01	2.02
Within 6	1.61	1.61	1.61
Total	1.40	1.40	1.41

IP - VHT per person

	No TDM	Medium	High
Within 1	0.03	0.04	0.04
Within 2	0.02	0.02	0.02
Within 3	0.02	0.02	0.02
Within 4	0.02	0.02	0.02
Within 5	0.03	0.03	0.03
Within 6	0.03	0.03	0.03
Total	0.03	0.03	0.03

PM - Change in Speed

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	22	23	23	2.9%	6.6%
Within 2	29	29	29	-0.4%	-0.2%
Within 3	24	24	24	0.2%	0.9%
Within 4	29	29	29	0.2%	1.3%
Within 5	35	35	36	1.2%	3.9%
Within 6	50	50	50	-0.3%	-0.4%
Total	40	40	41	0.6%	1.7%

PM - VKT per person

	No TDM	Medium	High
Within 1	3.83	3.84	3.85
Within 2	2.53	2.52	2.52
Within 3	2.05	2.05	2.03
Within 4	2.26	2.25	2.21
Within 5	7.03	7.03	6.99
Within 6	5.50	5.50	5.48
Total	4.87	4.86	4.86

PM - VHT per person

	No TDM	Medium	High
Within 1	0.17	0.17	0.16
Within 2	0.09	0.09	0.09
Within 3	0.09	0.09	0.08
Within 4	0.08	0.08	0.08
Within 5	0.20	0.20	0.19
Within 6	0.11	0.11	0.11
Total	0.12	0.12	0.12

Daily - Change in Speed

	No TDM	Medium	High	% Change - Med	% Change - High
Within 1	26	26	26	1.1%	3.3%
Within 2	33	33	33	0.1%	0.6%
Within 3	28	28	28	0.2%	0.8%
Within 4	31	31	32	0.2%	1.7%
Within 5	50	51	52	2.2%	4.8%
Within 6	54	54	54	0.1%	0.2%
Total	40	40	41	0.6%	1.7%

Daily - VKT per person

	No TDM	Medium	High
Within 1	3.97	4.00	4.04
Within 2	3.27	3.26	3.26
Within 3	2.51	2.51	2.50
Within 4	2.83	2.82	2.79
Within 5	8.30	8.32	8.32
Within 6	6.62	6.62	6.62
Total	5.76	5.77	5.78

Daily - VHT per person

	No TDM	Medium	High
Within 1	0.16	0.15	0.15
Within 2	0.10	0.10	0.10
Within 3	0.09	0.09	0.09
Within 4	0.09	0.09	0.09
Within 5	0.17	0.16	0.16
Within 6	0.12	0.12	0.12
Total	0.13	0.13	0.13

Daily - VHT per person removed

	No TDM	Medium	High
Within 1		0.016	0.128
Within 2		-1.641	0.084
Within 3		0.122	0.244
Within 4		-0.078	0.174
Within 5		1.990	2.464
Within 6		0.257	0.460
Total		0.240	0.278

Summary

Per Person
 Diversion 2% 4% 8%

From	To	No TDM		Medium		High	
		VKT	VHT	VKT	VHT	VKT	VHT
Zone 1	Zone 1	4.11	0.173	4.19	0.168	4.28	0.164
Zone 2	Zone 1	7.67	0.301	7.71	0.294	7.80	0.286
Zone 3	Zone 1	6.77	0.279	6.85	0.274	6.91	0.266
Zone 4	Zone 1	7.29	0.287	7.34	0.281	7.36	0.267
Zone 5	Zone 1	14.18	0.422	14.23	0.397	14.25	0.373
Zone 6	Zone 1	22.18	0.584	22.21	0.557	22.19	0.531

0% - 4%	0% - 8%
Δ VHT	Δ VHT
-0.004	-0.009
-0.007	-0.015
-0.005	-0.013
-0.006	-0.020
-0.025	-0.049
-0.026	-0.052

2.0
2.1
2.4
3.3
2.0
2.0

Average One-Way Trip Length (km) - Workplace Central Wellington

	Car as Driver	Car as Passenger	Public Transport	Cycling	Walking	Travel Time Savings
Central Wellington (LGWM area)	4.1	4.1	4.1	4.1	1.4	\$ 0.50
Northern suburbs (Tawa, Johnsonville)	14.2	14.2	14.2	14.2	1.4	\$ 1.73
Eastern suburbs (Seatoun, Miramar)	7.7	7.7	7.7	7.7	1.4	\$ 0.94
Southern suburbs (Island Bay, Miramar)	6.8	6.8	6.8	6.8	1.4	\$ 0.83
Western suburbs (Karori, Wadsworth)	7.3	7.3	7.3	7.3	1.4	\$ 0.89
Porirua and Kapiti Coast	22.2	22.2	22.2	22.2	1.4	\$ 2.71
Hutt Valley and Wairarapa	22.2	22.2	22.2	22.2	1.4	\$ 2.71

Average One-Way Trip Length (km) - Education

	Car as Driver	Car as Passenger	Public Transport	Cycling	Walking	Travel Time Savings
Central Wellington (LGWM area)	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Northern suburbs (Tawa, Johnsonville)	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Eastern suburbs (Seatoun, Miramar)	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Southern suburbs (Island Bay, Miramar)	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Western suburbs (Karori, Wadsworth)	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Porirua and Kapiti Coast	1.9	1.9	1.9	1.9	1.9	\$ 0.23
Hutt Valley and Wairarapa	1.9	1.9	1.9	1.9	1.9	\$ 0.23

<https://www.nzta.govt.nz/assets/resources/research/reports/399/docs/399.pdf>

Average One-Way Trip Length (km) - Education

	Car as Driver	Car as Passenger	Public Transport	Cycling	Walking
Central Wellington (LGWM area)	1.9	1.9	1.9	1.9	1.9
Northern suburbs (Tawa, Johnsonville)	1.9	1.9	1.9	1.9	1.9
Eastern suburbs (Seatoun, Miramar)	1.9	1.9	1.9	1.9	1.9
Southern suburbs (Island Bay, Miramar)	1.9	1.9	1.9	1.9	1.9
Western suburbs (Karori, Wadsworth)	1.9	1.9	1.9	1.9	1.9
Porirua and Kapiti Coast	1.9	1.9	1.9	1.9	1.9
Hutt Valley and Wairarapa	1.9	1.9	1.9	1.9	1.9

Average One-Way Trip Length (km) - Community

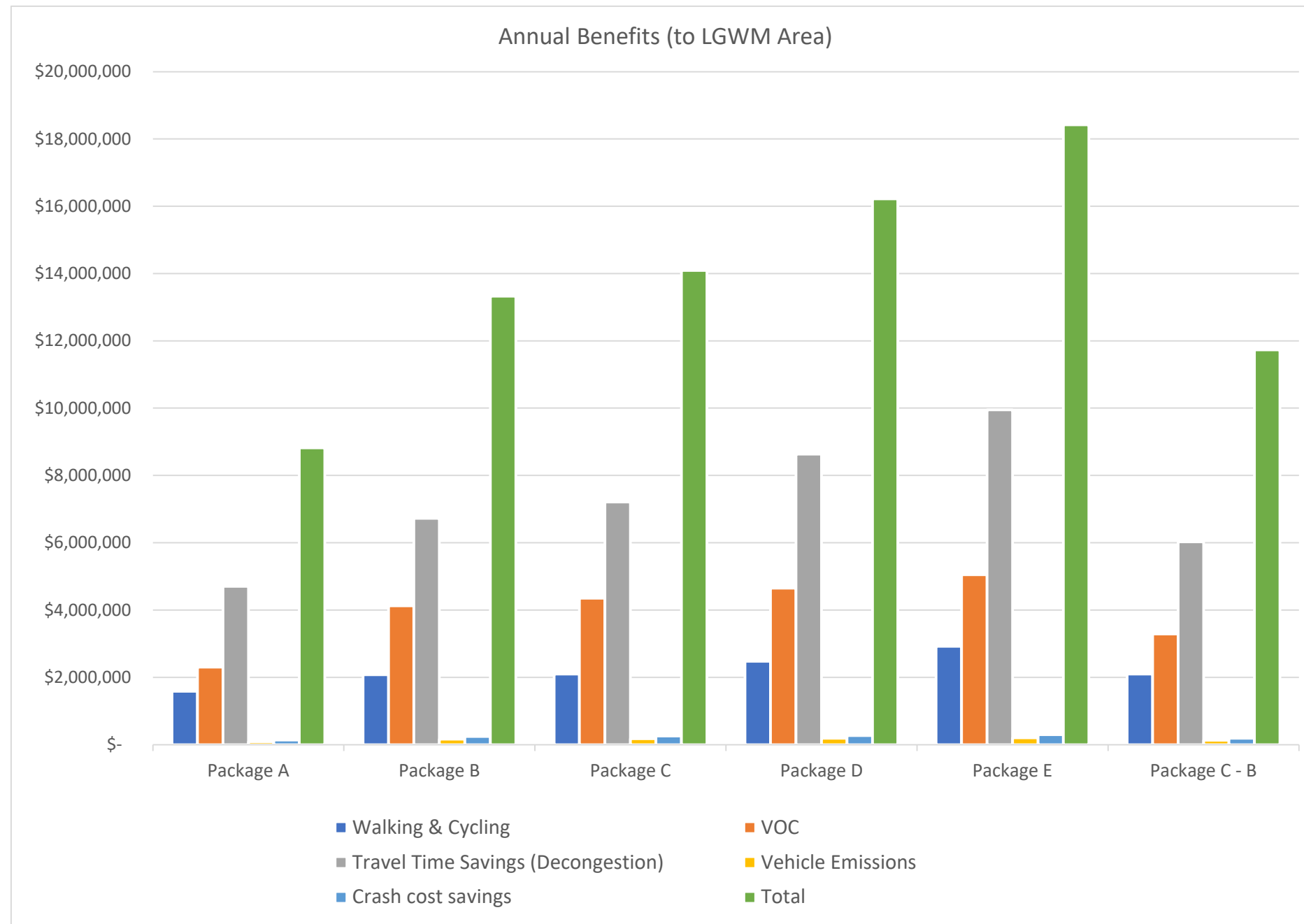
	Car as Driver	Car as Passenger	Public Transport	Cycling	Walking	Travel Time Savings
Central Wellington (LGWM area)	9.3	10.2	8	6.5	1.8	
Northern suburbs (Tawa, Johnsonville)	9.3	10.2	8	6.5	1.8	\$ 1.14
Eastern suburbs (Seatoun, Miramar)	9.3	10.2	8	6.5	1.8	\$ 1.14
Southern suburbs (Island Bay, Miramar)	9.3	10.2	8	6.5	1.8	\$ 1.14
Western suburbs (Karori, Wadsworth)	9.3	10.2	8	6.5	1.8	\$ 1.14
Porirua and Kapiti Coast	9.3	10.2	8	6.5	1.8	\$ 1.14
Hutt Valley and Wairarapa	9.3	10.2	8	6.5	1.8	\$ 1.14
	9.3	10.2	8	6.5	1.8	\$ 1.14

<https://www.nzta.govt.nz/assets/resources/research/reports/399/docs/399.pdf>

**Monetised Benefits and Costs Manual Method
Summary (Annual Benefits to LGWM Area)**

	Walking & Cycling	VOC	Travel Time Savings (Decongestion)	Vehicle Emissions	Crash cost savings	Total	Secondary School Benefits
Package A	\$ 1,584,565	\$ 2,305,861	\$ 4,702,147	\$ 92,234	\$ 134,631	\$ 8,819,439	\$ 2,447,207
Package B	\$ 2,077,955	\$ 4,124,515	\$ 6,722,369	\$ 164,981	\$ 239,476	\$ 13,329,295	\$ 2,447,207
Package C	\$ 2,097,999	\$ 4,353,924	\$ 7,213,476	\$ 174,157	\$ 252,701	\$ 14,092,257	\$ 2,447,207
Package D	\$ 2,479,160	\$ 4,649,170	\$ 8,633,231	\$ 185,967	\$ 270,828	\$ 16,218,356	\$ 3,874,669
Package E	\$ 2,921,662	\$ 5,052,330	\$ 9,947,148	\$ 202,093	\$ 294,993	\$ 18,418,226	\$ 3,874,669
Package C - B	\$ 2,097,999	\$ 3,286,209	\$ 6,025,662	\$ 131,448	\$ 191,148	\$ 11,732,466	\$ 2,447,207

excluding Parking Levy Benefits



Annual Benefits to LGWM Area

New user Health and environment benefits for walking					New user Health and environment benefits for cycling				
Benefit	\$ 4.40	<u>OR (whatever is smaller)</u>			Benefit	\$ 2.20	<u>OR (whatever is smaller)</u>		
Duration	460 trips (230 days)				Duration	460			
	Workplace	School - Primary	School - Secondary	Community (Marketing)		Workplace	School - Primary	School - Secondary	Community (Marketing)
Package A	\$ 93,336	\$ -	\$ 1,267,189	\$ 1,162,438	Package A	\$ 30,880	\$ -	\$ 126,737	\$ 604,301
Package B	\$ 93,336	\$ -	\$ 1,267,189	\$ 1,734,179	Package B	\$ 30,880	\$ -	\$ 126,737	\$ 901,523
Package C	\$ 75,160	\$ -	\$ 1,267,189	\$ 1,734,179	Package C	\$ 58,944	\$ -	\$ 126,737	\$ 901,523
Package D	\$ 80,177	\$ 182,232	\$ 2,006,343	\$ 1,734,179	Package D	\$ 62,878	\$ 24,264	\$ 200,663	\$ 901,523
Package E	\$ 80,177	\$ 1,648,017	\$ 2,006,343	\$ 2,192,928	Package E	\$ 62,878	\$ 219,436	\$ 200,663	\$ 560,067
Package C-B					Package C-B	\$ 58,944			\$ 1,057,943

Vehicle Operating Costs				
Update Factor	1.1			
Benefit	-\$ 0.25 cent/km	assume 41.5km/h from WTSM outputs and 0% gradient		
Reduced VKT				
Trip Factor Workplace	460	~230 days		
Trip Factor School	386	~193 days		
Trip Factor Community	460	~230 days		
	Workplace (km)	School - Primary (km)	School - Secondary	Community (km)
Package A	- 5,229,363	-	-	619,660 - 3,446,930
Package B	- 10,865,809	-	-	619,660 - 5,142,288
Package C	- 11,790,657	-	-	619,660 - 5,142,288
Package D	- 12,577,607	- 41,872	-	981,109 - 5,142,288
Package E	- 12,577,607	- 378,670	-	981,109 - 6,430,805
Package C-B	- 7,486,222			
VOC				
	Workplace	School - Primary	School - Secondary	Community Total
Package A	\$ 1,297,144	\$ -	\$ 153,707	\$ 855,011 \$ 2,305,861
Package B	\$ 2,695,264	\$ -	\$ 153,707	\$ 1,275,545 \$ 4,124,515
Package C	\$ 2,924,672	\$ -	\$ 153,707	\$ 1,275,545 \$ 4,353,924
Package D	\$ 3,119,875	\$ 10,386	\$ 243,364	\$ 1,275,545 \$ 4,649,170
Package E	\$ 3,119,875	\$ 93,929	\$ 243,364	\$ 1,595,161 \$ 5,052,330
Package C-B	\$ 1,856,957			\$ 3,286,209

Step: Multiple reduction in car by average one-way travel length by number of trips per year

Step: Multiple VKT reduced by cost per km

Impact on Greenhouse Gases (% of VOC)					
Greenhouse Gases					
Percent of VOC	4%				
	Workplace	School - Primary	School - Seconda	Community	Total
Package A	\$ 51,886	\$ -	\$ 6,148	\$ 34,200	\$ 92,234
Package B	\$ 107,811	\$ -	\$ 6,148	\$ 51,022	\$ 164,981
Package C	\$ 116,987	\$ -	\$ 6,148	\$ 51,022	\$ 174,157
Package D	\$ 124,795	\$ 415	\$ 9,735	\$ 51,022	\$ 185,967
Package E	\$ 124,795	\$ 3,757	\$ 9,735	\$ 63,806	\$ 202,093
Package C-B	\$ 74,278				\$ 131,448

Step: Take 4% of VOC as greenhouse gas reduction

Travel Time Savings (Decongestion Benefits)						
Update Factor	1.54				1.54	
Network Time Saving per vehicle removed	0.51 hours	Taken from WTSM output - this is the network travel time saving per vehicle removed.				0.51
Network Time Saving per vehicle removed (Daily)	0.24 hours	Taken from WTSM output - this is the network travel time saving per vehicle removed.				0.24
Commuting to/from work	\$ 7.80	Table 15 MBCM				7.8
Other non-work travel purpose	\$ 6.90	Table 15 MBCM				6.9
Trip Factor Workplace	460	~230 days				
Trip Factor School	386	~193 days				
	Workplace	School - Primary	School - Seconda	Community	Total	
Package A	\$ 1,989,639	\$ -	\$ 1,767,420	\$ 945,088	\$ 4,702,147	
Package B	\$ 3,545,024	\$ -	\$ 1,767,420	\$ 1,409,925	\$ 6,722,369	
Package C	\$ 4,036,131	\$ -	\$ 1,767,420	\$ 1,409,925	\$ 7,213,476	
Package D	\$ 4,305,516	\$ 119,429	\$ 2,798,361	\$ 1,409,925	\$ 8,633,231	
Package E	\$ 4,305,516	\$ 1,080,057	\$ 2,798,361	\$ 1,763,214	\$ 9,947,148	
Package C-B	\$ 2,848,316				\$ 6,025,662	

Note: Workplace and school use AM peak, community uses the daily.

Accident Cost Savings (Mid-block Only)

Update Factor **1.09**
Urban mid-block = $b_0 * Q^{b_1} * L$ assume $b_1 = 1.0$ for the purpose of this calculation, this reduce the equation to exposure.
 b_0 0.0000299 Assume travel is predominately on Primary and Secondary Collectors

Rural mid-block (Motor) = $b_0 * L * AADT * 365 / 10^8$
 b_0 8 National Strategic (High Volume)

Cost per injury crash \$ 275,000 50km/h
 Cost per injury crash \$ 585,000 100 km/h

Assume travel on **20%** Rural mid-block (**80%** Urban Mid-block)

Exposure (AADT reduced * L)

	Workplace (km*	School - Primary (km)	School - Secondary	Community
Package A	- 11,368.18	- -	1,605.34	- 7,493
Package B	- 23,621.32	- -	1,605.34	- 11,178.89
Package C	- 25,631.86	- -	1,605.34	- 11,178.89
Package D	- 27,342.62	- 108.48	- 2,541.73	- 11,178.89
Package E	- 27,342.62	- 981.01	- 2,541.73	- 13,980.01
Package C-B	- 16,274.40			

Benefits

	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ 74,780	\$ -	\$ 10,560	\$ 49,291	\$ 134,631
Package B	\$ 155,381	\$ -	\$ 10,560	\$ 73,535	\$ 239,476
Package C	\$ 168,607	\$ -	\$ 10,560	\$ 73,535	\$ 252,701
Package D	\$ 179,860	\$ 714	\$ 16,720	\$ 73,535	\$ 270,828
Package E	\$ 179,860	\$ 6,453	\$ 16,720	\$ 91,961	\$ 294,993
Package C-B	\$ 107,053				\$ 191,148

Vehicle Operating Costs						
Update Factor	1.1					
Benefit	-\$ 0.25	cent/km	assume 41.5km/h from WTSM outputs and 0% gradient			
Reduced VKT						
Trip Factor Workp	460	~230 days				
Trip Factor Schoo	386	~193 days				
Trip Factor Comm	460	~230 days				
		Workplace (km)	School - Primary (km)	School - Secondar Community		
Package A	-	-	-	-		
Package B	-	-	-	-		
Package C	-	-	-	-		
Package D	-	-	-	-		
Package E	-	1,147,668	1,217,023	9,536,112		
Package C-B	-	-	-	-		
VOC						
		Workplace	School - Primary	School - Secondar Community	Total	
Package A	\$	-	\$	-	\$	-
Package B	\$	-	\$	-	\$	-
Package C	\$	-	\$	-	\$	-
Package D	\$	-	\$	-	\$	-
Package E	\$	-	\$ 284,679	\$ 301,883	\$ 2,365,432	\$ 2,951,994
Package C-B	\$	-	\$	-	\$	-

Impact on Greenhouse Gases (% of VOC)						
Greenhouse Gases						
Percent of VOC	4%					
		Workplace	School - Primary	School - Seconda Community	Total	
Package A	\$	-	\$	-	\$	-
Package B	\$	-	\$	-	\$	-
Package C	\$	-	\$	-	\$	-
Package D	\$	-	\$	-	\$	-
Package E	\$	-	\$ 11,387	\$ 12,075	\$ 94,617	\$ 118,080
Package C-B	\$	-	\$	-	\$	-

Travel Time Savings (Decongestion Benefits)						
Update Factor	1.54					
Network Time Saving per vehicle removed (Peak)	0.51	hours	This has been used for the school and workplace			
Network Time Saving per vehicle removed (Daily)	0.24	hours	This has been used for the community			
Commuting to/from	\$ 7.80	Table 15 MBCM				
Other non-work t	\$ 6.90	Table 15 MBCM				
Trip Factor Workp	460	~230 days				
Trip Factor Schoo	386	~193 days				
		Workplace	School - Primary	School - Seconda Community	Total	
Package A	\$	-	\$	-	\$	-
Package B	\$	-	\$	-	\$	-
Package C	\$	-	\$	-	\$	-
Package D	\$	-	\$	-	\$	-
Package E	\$	-	\$ 3,273,428	\$ 3,471,245	\$ 2,614,634	\$ 9,359,307
Package C-B	\$	-	\$	-	\$	-

Accident Cost Savings (Mid-block Only)						
Update Factor	1.09					
Urban mid-block	=b0*Q^b1*L	assume b1 = 1.0 for the purpose of this calculation, this reduce the equation to exposure.				
b0	0.0000299	Assume travel is predominately on Primary and Secondary Collectors				
Rural mid-block	=b0*L*AADT*365/10^8					
b0	8	National Strategic (High Volume)				
Cost per injury cr:	\$ 275,000	50km/h				
Cost per injury cr:	\$ 585,000	100 km/h				
Assume	20%	Rural mid-block (Motorway)	80%	Urban Mid-block		
Exposure (AADT reduced * L)						
		Workplace (l	School - Primary	School - Secondary Community	Total	
Package A	-	-	-	-	-	
Package B	-	-	-	-	-	
Package C	-	-	-	-	-	
Package D	-	-	-	-	-	
Package E	-	2,973.23	3,152.91	20,730.68		
Package C-B	-	-	-	-	-	
Benefits						
		Workplace	School - Primary	School - Secondar Community	Total	
Package A	\$	-	\$	-	\$	-
Package B	\$	-	\$	-	\$	-
Package C	\$	-	\$	-	\$	-
Package D	\$	-	\$	-	\$	-
Package E	\$	-	\$ 19,558	\$ 20,740	\$ 136,367	\$ 176,664
Package C-B	\$	-	\$	-	\$	-

Monetised Benefits and Costs Manual Method
Annual Benefits to LGWM during periods of disruption

Step 1: Workplace Target Population (refer to Target Population Tab for inputs)
Part A: Select diversion rates (this calculation uses MBCM Table 5, Table 6, Table 7)

EEM Diversion Rates						
Workplace	Score	Reduction in car as Car as passenger	Public Transpo	Cycling	Walking	
Standard						
Low	SL	0%	0%	0%	0%	0%
Medium	SM	-6%	26%	26%	12%	36%
Alternative (with pt)	Score	Reduction in car as Car as passenger	Public Transpo	Cycling	Walking	
Low	AL	0%	0%	0%	0%	0%
Medium	AM	-6%	26%	52%	6%	16%
Medium (Other)	AM (Other)	-6%	26%	74%	0%	0%
High (Parking)	AH (Parking)	-8%	26%	57%	8%	9%
High (Parking Other)	AH (Parking/Other)	-8%	26%	74%	0%	0%
High (Other)	AH (Other)	-14%	26%	74%	0%	0%
High	AH	-14%	26%	57%	8%	9%
School						
School type		Reduction in car as Car as passenger	Public Transpo	Cycling	Walking	
Primary	SP	0%	-10%	0%	17%	83%
Secondary/intermedi	SS	0%	-10%	55%	6%	39%
Community						
Low	CL	-2%	-0.2%	42%	25%	33%
Standard	CS	-4%	-0.5%	39%	25%	36%

We have created
We have created
We have created
We have created

Part C: Calculate total population and trip data, and total employment that c
Part D: Calculate package target audience = total population x private vehicle mode share (x percentage of target audience with a workplace travel plan)
Diversion rate have been assigned based on MBCM rates and those achieved in the critical review (see Diversion Review Tab for more information)

Target Age 20-69 69% <https://forecast.idnz.co.nz/wellington/population-age-structure>

Workplace Package TDM Scoring

Package	Area From	Area To	Total Target Popul	Diversion Rate	Reduction in car				
					as driver	Car as passenger	Public Transport	Cycling	Walking
Package A	Central Wellington (I	Central Wellington	155	SM	-9	2	2	1	3
	Northern suburbs (T	Central Wellington	3,017	AM (Other)	-181	47	134	0	0
	Eastern suburbs (Se	Central Wellington	1,227	SM	-74	19	19	9	27
	Southern suburbs (I	Central Wellington	1,259	SM	-76	20	20	9	27
	Western suburbs (K	Central Wellington	1,476	SM	-89	23	23	11	32
	Porirua and Kapiti C	Central Wellington	2,987	AM (Other)	-179	47	133	0	0
Package B	Hutt Valley and Wair	Central Wellington	4,000	AM (Other)	-240	62	178	0	0
	Central Wellington (I	Central Wellington	155	SM	-9	2	2	1	3
	Northern suburbs (T	Central Wellington	3,017	AM (Other)	-181	47	134	0	0
	Eastern suburbs (Se	Central Wellington	1,227	SM	-74	19	19	9	27
	Southern suburbs (I	Central Wellington	1,259	SM	-76	20	20	9	27
	Western suburbs (K	Central Wellington	1,476	SM	-89	23	23	11	32
Package C	Porirua and Kapiti C	Central Wellington	2,987	AH (Other)	-415	108	307	0	0
	Hutt Valley and Wair	Central Wellington	4,000	AH (Other)	-556	145	411	0	0
	Central Wellington (I	Central Wellington	159	AH (Parking)	-13	3	7	1	1
	Northern suburbs (T	Central Wellington	3,085	AH (Parking/O	-247	64	183	0	0
	Eastern suburbs (Se	Central Wellington	1,255	AH (Parking)	-100	26	57	8	9
	Southern suburbs (I	Central Wellington	1,287	AH (Parking)	-103	27	59	8	9
Package D	Western suburbs (K	Central Wellington	1,509	AH (Parking)	-121	31	69	10	11
	Porirua and Kapiti C	Central Wellington	3,054	AH (Other)	-425	110	314	0	0
	Hutt Valley and Wair	Central Wellington	4,090	AH (Other)	-568	148	421	0	0
	Central Wellington (I	Central Wellington	169	AH (Parking)	-14	4	8	1	1
	Northern suburbs (T	Central Wellington	3,291	AH (Parking/O	-263	68	195	0	0
	Eastern suburbs (Se	Central Wellington	1,339	AH (Parking)	-107	28	61	9	10
Package E	Southern suburbs (I	Central Wellington	1,373	AH (Parking)	-110	29	63	9	10
	Western suburbs (K	Central Wellington	1,610	AH (Parking)	-129	33	73	10	12
	Porirua and Kapiti C	Central Wellington	3,258	AH (Other)	-453	118	335	0	0
	Hutt Valley and Wair	Central Wellington	4,363	AH (Other)	-606	158	449	0	0
	Central Wellington (I	Central Wellington	169	AH (Parking)	-14	4	8	1	1
	Northern suburbs (T	Central Wellington	3,291	AH (Parking/O	-263	68	195	0	0
Package C - B	Eastern suburbs (Se	Central Wellington	1,339	AH (Parking)	-107	28	61	9	10
	Southern suburbs (I	Central Wellington	1,373	AH (Parking)	-110	29	63	9	10
	Western suburbs (K	Central Wellington	1,610	AH (Parking)	-129	33	73	10	12
	Porirua and Kapiti C	Central Wellington	3,258	AH (Other)	-453	118	335	0	0
	Hutt Valley and Wair	Central Wellington	4,363	AH (Other)	-606	158	449	0	0
	Central Wellington (I	Central Wellington	159	AH (Parking)	-13	3	7	1	1
Northern suburbs (T	Central Wellington	3,085	AH (Parking/O	-247	64	183	0	0	
Eastern suburbs (Se	Central Wellington	1,255	AH (Parking)	-100	26	57	8	9	
Southern suburbs (I	Central Wellington	1,287	AH (Parking)	-103	27	59	8	9	
Western suburbs (K	Central Wellington	1,509	AH (Parking)	-121	31	69	10	11	
Porirua and Kapiti C	Central Wellington	3,054	AH (Parking/O	-244	64	181	0	0	
Hutt Valley and Wair	Central Wellington	4,090	AH (Parking/O	-327	85	242	0	0	

Community (Marketing, Communication, Incentives)

Package	Area	Total Target Popul	Diversion Rate	Reduction in car				
				as driver	Car as passenger	Public Transport	Cycling	Walking
Package A	Central Wellington	32,340	CL	-647	-65	299	178	235
	Northern suburbs (I	0	CL	0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-529	-53	244	145	192
	Southern suburbs (I	21,792	CL	-436	-44	201	120	158
	Western suburbs (I	0	CL	0	0	0	0	0
	Porirua and Kapiti C	0	CL	0	0	0	0	0
Package B	Hutt Valley and Wa	0	CL	0	0	0	0	0
	Central Wellington	32,340	CL	-647	-65	299	178	235
	Northern suburbs (I	0	CL	0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-529	-53	244	145	192
	Southern suburbs (I	21,792	CL	-436	-44	201	120	158
	Western suburbs (I	0	CL	0	0	0	0	0
Package C	Porirua and Kapiti C	15,463	CL	-309	-31	143	85	112
	Hutt Valley and Wa	24,166	CL	-483	-48	223	133	175
	Central Wellington	32,340	CL	-647	-65	299	178	235
	Northern suburbs (I	0	CL	0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-529	-53	244	145	192
	Southern suburbs (I	21,792	CL	-436	-44	201	120	158
Package D	Western suburbs (I	0	CL	0	0	0	0	0
	Porirua and Kapiti C	15,463	CL	-309	-31	143	85	112
	Hutt Valley and Wa	24,166	CL	-483	-48	223	133	175
	Central Wellington	32,340	CL	-647	-65	299	178	235
	Northern suburbs (I	0	CL	0	0	0	0	0
	Eastern suburbs (S	26,441	CL	-529	-53	244	145	192
Package E	Southern suburbs (I	21,792	CL	-436	-44	201	120	158
	Western suburbs (I	14,000	CL	0	0	0	0	0
	Porirua and Kapiti C	15,463	CL	-309	-31	143	85	112
	Hutt Valley and Wa	24,166	CL	-483	-48	223	133	175
	Central Wellington	32,340	CL	-647	-65	299	178	235
	Northern suburbs (I	0	CL	0	0	0	0	0

School Package TDM Scoring

Primary

Package	Area	Total Target Popul:	Diversion Rate	Reduction in car as driver				
				Car as passenger	Public Transport	Cycling	Walking	
Package A	Central Wellington (I	634	SP	0	-63	0	11	53
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
Hutt Valley and Wair	0		0	0	0	0	0	
Package B	Central Wellington (I	634	SP	0	-63	0	11	53
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
Hutt Valley and Wair	0		0	0	0	0	0	
Package C	Central Wellington (I	634	SP	0	-63	0	11	53
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
Hutt Valley and Wair	0		0	0	0	0	0	
Package D	Central Wellington (I	634	SP	0	-63	0	11	53
	Northern suburbs (T	0		0	0	0	0	0
	Eastern suburbs (Se	0		0	0	0	0	0
	Southern suburbs (I	0		0	0	0	0	0
	Western suburbs (K	0		0	0	0	0	0
	Porirua and Kapiti C	0		0	0	0	0	0
Hutt Valley and Wair	0		0	0	0	0	0	
Package E	Central Wellington (I	634	SP	0	-63	0	11	53
	Northern suburbs (T	2063	SP	0	-206	0	35	171
	Eastern suburbs (Se	1580	SP	0	-158	0	27	131
	Southern suburbs (I	678	SP	0	-68	0	12	56
	Western suburbs (K	781	SP	0	-78	0	13	65
	Porirua and Kapiti C	0	SP	0	0	0	0	0
Hutt Valley and Wair	0	SP	0	0	0	0	0	

Intermediate/ Secondary/Tertiary

Package	Area	Total Target Population	Reduction in car as driver					
			Car as passenger	Public Transport	Cycling	Walking		
Package A	Central Wellington (I	4442	SS	0	-444	244	27	173
	Northern suburbs (	11019	SS	0	-1102	606	66	430
	Eastern suburbs (S	5511	SS	0	-551	303	33	215
	Southern suburbs (I	2789	SS	0	-279	153	17	109
	Western suburbs (I	1655	SS	0	-166	91	10	65
	Porirua and Kapiti C	0	SS	0	0	0	0	0
Hutt Valley and Wa	0	SS	0	0	0	0	0	
Package B	Central Wellington (I	4442	SS	0	-444	244	27	173
	Northern suburbs (	11019	SS	0	-1102	606	66	430
	Eastern suburbs (S	5511	SS	0	-551	303	33	215
	Southern suburbs (I	2789	SS	0	-279	153	17	109
	Western suburbs (I	1655	SS	0	-166	91	10	65
	Porirua and Kapiti C	0	SS	0	0	0	0	0
Hutt Valley and Wa	0	SS	0	0	0	0	0	
Package C	Central Wellington (I	4442	SS	0	-444	244	27	173
	Northern suburbs (	11019	SS	0	-1102	606	66	430
	Eastern suburbs (S	5511	SS	0	-551	303	33	215
	Southern suburbs (	2789	SS	0	-279	153	17	109
	Western suburbs (I	1655	SS	0	-166	91	10	65
	Porirua and Kapiti C	0	SS	0	0	0	0	0
Hutt Valley and Wa	0	SS	0	0	0	0	0	
Package D	Central Wellington (I	4442	SS	0	-444	244	27	173
	Northern suburbs (	11019	SS	0	-1102	606	66	430
	Eastern suburbs (S	5511	SS	0	-551	303	33	215
	Southern suburbs (	2789	SS	0	-279	153	17	109
	Western suburbs (I	1655	SS	0	-166	91	10	65
	Porirua and Kapiti C	0	SS	0	0	0	0	0
Hutt Valley and Wa	0	SS	0	0	0	0	0	
Package E	Central Wellington (I	4442	SS	0	-444	244	27	173
	Northern suburbs (	11019	SS	0	-1102	606	66	430
	Eastern suburbs (S	5511	SS	0	-551	303	33	215
	Southern suburbs (	2789	SS	0	-279	153	17	109
	Western suburbs (I	1655	SS	0	-166	91	10	65
	Porirua and Kapiti C	0	SS	0	0	0	0	0
Hutt Valley and Wa	0	SS	0	0	0	0	0	

Summary (Annual Benefits)

	Walking & Cycling	VOC	Travel Time Savings (Decongestion)	Vehicle Emissi	Crash cost saving	Total
Package A (D)	\$ 3,643,167	\$ 3,740,501	\$ 9,727,033	\$ 149,620	\$ 220,876	\$ 17,481,198
Package B (D)	\$ 4,547,715	\$ 5,979,688	\$ 12,212,093	\$ 239,188	\$ 349,965	\$ 23,328,649
Package C (D)	\$ 4,467,688	\$ 6,214,948	\$ 12,712,174	\$ 248,598	\$ 363,528	\$ 24,006,936
Package D (D)	\$ 4,474,714	\$ 6,427,857	\$ 13,008,718	\$ 257,114	\$ 375,802	\$ 24,544,204
Package E	\$ 4,344,494	\$ 6,520,682	\$ 14,076,083	\$ 260,827	\$ 382,179	\$ 25,584,265
Package C - B	\$ 4,467,688	\$ 5,147,233	\$ 11,524,360	\$ 205,889	\$ 301,974	\$ 21,647,145

Secondary School Benefits
\$ 7,361,464
\$ 7,361,464
\$ 7,361,464
\$ 7,361,464
\$ 7,361,464

New user Health and environment benefits for walking

Benefit	\$ 4.40	OR (whatever is smaller)				\$ 1,250			
Duration	460 trips (230 days)					1			
	Workplace	School - Primary	School - Secon	Community (Marketing)	Workplace	School - Primary	School - Secon	Community (Market Total)	
Package A	\$ 252,008	\$ 202,479	\$ 3,811,841	\$ 2,131,137	\$ 111,170	\$ 65,815	\$ 1,239,027	\$ 731,204	\$ 2,147,215
Package B	\$ 252,008	\$ 202,479	\$ 3,811,841	\$ 3,179,327	\$ 111,170	\$ 65,815	\$ 1,239,027	\$ 1,090,843	\$ 2,506,855
Package C	\$ 85,897	\$ 202,479	\$ 3,811,841	\$ 3,179,327	\$ 37,892	\$ 65,815	\$ 1,239,027	\$ 1,090,843	\$ 2,433,577
Package D	\$ 91,630	\$ 202,479	\$ 3,811,841	\$ 3,179,327	\$ 40,421	\$ 65,815	\$ 1,239,027	\$ 1,090,843	\$ 2,436,107
Package E	\$ 91,630	\$ 1,831,130	\$ 3,811,841	\$ 3,179,327	\$ 40,421	\$ 595,203	\$ 1,239,027	\$ 1,090,843	\$ 2,965,494
Package C-B					\$ 37,892				\$ 2,433,577

New user Health and environment benefits for cycling

Benefit	\$ 2.20	OR (whatever is smaller)				\$ 2,500.00			
Duration	460					1			
	Workplace	School - Primary	School - Secon	Community (Marketing)	Workplace	School - Primary	School - Secon	Community (Market Total)	
Package A	\$ 214,377	\$ 20,736	\$ 293,219	\$ 2,915,065	\$ 74,113	\$ 26,960	\$ 381,239	\$ 1,107,884	\$ 1,495,952
Package B	\$ 214,377	\$ 20,736	\$ 293,219	\$ 4,348,828	\$ 74,113	\$ 26,960	\$ 381,239	\$ 1,652,792	\$ 2,040,860
Package C	\$ 194,855	\$ 20,736	\$ 293,219	\$ 4,348,828	\$ 67,364	\$ 26,960	\$ 381,239	\$ 1,652,792	\$ 2,034,111
Package D	\$ 207,860	\$ 20,736	\$ 293,219	\$ 4,348,828	\$ 71,860	\$ 26,960	\$ 381,239	\$ 1,652,792	\$ 2,038,607
Package E	\$ 207,860	\$ 187,525	\$ 293,219	\$ 4,348,828	\$ 71,860	\$ 243,818	\$ 381,239	\$ 826,396	\$ 1,379,000
Package C-B					\$ 67,364				\$ 2,034,111

Vehicle Operating Costs					
Update Factor	1.1				
Benefit	-\$ 0.25	cent/km	assume 41.5km/h from WTSM outputs and 0% gradient		
Reduced VKT					
Trip Factor Workplace	460	~230 days			
Trip Factor School	386	~193 days			
Trip Factor Community	460	~230 days			
	Workplace (km)	School - Primary	School - Secondary	Community	
Package A	- 6,275,236	- 46,524	- 1,864,005	- 6,893,860	
Package B	- 11,911,682	- 46,524	- 1,864,005	- 10,284,576	
Package C	- 12,860,117	- 46,524	- 1,864,005	- 10,284,576	
Package D	- 13,718,447	- 46,524	- 1,864,005	- 10,284,576	
Package E	- 13,718,447	- 420,744	- 1,864,005	- 10,284,576	
Package C-B	- 8,555,682				
VOC					
	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ 1,556,572	\$ 11,540	\$ 462,366	\$ 1,710,022	\$ 3,740,501
Package B	\$ 2,954,693	\$ 11,540	\$ 462,366	\$ 2,551,089	\$ 5,979,688
Package C	\$ 3,189,952	\$ 11,540	\$ 462,366	\$ 2,551,089	\$ 6,214,948
Package D	\$ 3,402,861	\$ 11,540	\$ 462,366	\$ 2,551,089	\$ 6,427,857
Package E	\$ 3,402,861	\$ 104,366	\$ 462,366	\$ 2,551,089	\$ 6,520,682
Package C-B	\$ 2,122,237				\$ 5,147,233

Impact on Greenhouse Gases (% of VOC)					
Greenhouse Gases					
Percent of VOC	4%				
	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ 62,263	\$ 462	\$ 18,495	\$ 68,401	\$ 149,620
Package B	\$ 118,188	\$ 462	\$ 18,495	\$ 102,044	\$ 239,188
Package C	\$ 127,598	\$ 462	\$ 18,495	\$ 102,044	\$ 248,598
Package D	\$ 136,114	\$ 462	\$ 18,495	\$ 102,044	\$ 257,114
Package E	\$ 136,114	\$ 4,175	\$ 18,495	\$ 102,044	\$ 260,827
Package C-B	\$ 84,889				\$ 205,889

Travel Time Savings (Decongestion Benefits)					
Update Factor	1.54				
Network Time Saving per vehicle removed (Peak)	0.51	hours	This has been used for the school and workplace		
Network Time Saving per vehicle removed (Daily)	0.24	hours	This has been used for the community		
Commuting to/from	\$ 7.80	Table 15 MBCM			
Other non-work travel	\$ 6.90	Table 15 MBCM			
Trip Factor Workplace	460	~230 days			
Trip Factor School	386	~193 days			
	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ 2,387,567	\$ 132,699	\$ 5,316,593	\$ 1,890,175	\$ 9,727,033
Package B	\$ 3,942,952	\$ 132,699	\$ 5,316,593	\$ 2,819,850	\$ 12,212,093
Package C	\$ 4,443,033	\$ 132,699	\$ 5,316,593	\$ 2,819,850	\$ 12,712,174
Package D	\$ 4,739,577	\$ 132,699	\$ 5,316,593	\$ 2,819,850	\$ 13,008,718
Package E	\$ 4,739,577	\$ 1,200,063	\$ 5,316,593	\$ 2,819,850	\$ 14,076,083
Package C-B	\$ 3,255,219				\$ 11,524,360

Accident Cost Savings (Mid-block Only)					
Update Factor	1.09				
Urban mid-block	$=b_0*Q*b_1*L$		assume $b_1 = 1.0$ for the purpose of this calculation, this reduce the equation to exposure.		
b_0	0.0000299		Assume travel is predominately on Primary and Secondary Collectors		
Rural mid-block	$=b_0*L*AADT*365/10^8$				
b_0	8		National Strategic (High Volume)		
Cost per injury cr	\$ 275,000		50km/h		
Cost per injury cr	\$ 585,000		100 km/h		
Assume	20%	Rural mid-block	80%	Urban Mid-block	
Exposure (AADT reduced * L)					
	Workplace (kn)	School - Primary (kn)	School - Secondary	Community	Total
Package A	- 13,641.82	- 120.53	- 4,829.03	- 14,986.65	
Package B	- 25,894.96	- 120.53	- 4,829.03	- 22,357.77	
Package C	- 27,956.78	- 120.53	- 4,829.03	- 22,357.77	
Package D	- 29,822.71	- 120.53	- 4,829.03	- 22,357.77	
Package E	- 29,822.71	- 1,090.01	- 4,829.03	- 22,357.77	
Package C-B	- 18,599.31				
Benefits					
	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ 89,736	\$ 793	\$ 31,765	\$ 98,582	\$ 220,876
Package B	\$ 170,337	\$ 793	\$ 31,765	\$ 147,070	\$ 349,965
Package C	\$ 183,900	\$ 793	\$ 31,765	\$ 147,070	\$ 363,528
Package D	\$ 196,174	\$ 793	\$ 31,765	\$ 147,070	\$ 375,802
Package E	\$ 196,174	\$ 7,170	\$ 31,765	\$ 147,070	\$ 382,179
Package C-B	\$ 122,346				\$ 301,974

Vehicle Operating Costs

Update Factor **1.1**
 Benefit -\$ **0.25** cent/km assume 41.5km/h from WTSM outputs and 0% gradient

Reduced VKT

Trip Factor Workplace **460** ~230 days
 Trip Factor School **386** ~193 days
 Trip Factor Community **460** ~230 days

	Workplace (km)	School - Primary (k)	School - Secondary	Community
Package A	-	-	-	-
Package B	-	-	-	-
Package C	14,954,253	-	-	-
Package D	-	-	-	-
Package E	-	-	-	-
Package C-B	-	-	-	-

VOC

	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ -	\$ -	\$ -	\$ -	\$ -
Package B	\$ -	\$ -	\$ -	\$ -	\$ -
Package C	\$ 3,709,402	\$ -	\$ -	\$ -	\$ 3,709,402
Package D	\$ -	\$ -	\$ -	\$ -	\$ -
Package E	\$ -	\$ -	\$ -	\$ -	\$ -
Package C-B	\$ -	\$ -	\$ -	\$ -	\$ -

Impact on Greenhouse Gases (% of VOC)

Greenhouse Gases

Percent of VOC **4%**

	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ -	\$ -	\$ -	\$ -	\$ -
Package B	\$ -	\$ -	\$ -	\$ -	\$ -
Package C	\$ 148,376	\$ -	\$ -	\$ -	\$ 148,376
Package D	\$ -	\$ -	\$ -	\$ -	\$ -
Package E	\$ -	\$ -	\$ -	\$ -	\$ -
Package C-B	\$ -	\$ -	\$ -	\$ -	\$ -

Travel Time Savings (Decongestion Benefits)

Update Factor **1.54**
 Network Time Saving per vehicle removed (Peak) **0.51 hours** This has been used for the school and workplace
 Network Time Saving per vehicle removed (Daily) **0.24 hours** This has been used for the community
 Commuting to/from \$ **7.80** Table 15 MBCM
 Other non-work trav \$ **6.90** Table 15 MBCM
 Trip Factor Workplace **460** ~230 days
 Trip Factor School **386** ~193 days

	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ -	\$ -	\$ -	\$ -	\$ -
Package B	\$ -	\$ -	\$ -	\$ -	\$ -
Package C	\$ 5,689,711	\$ -	\$ -	\$ -	\$ 5,689,711
Package D	\$ -	\$ -	\$ -	\$ -	\$ -
Package E	\$ -	\$ -	\$ -	\$ -	\$ -
Package C-B	\$ -	\$ -	\$ -	\$ -	\$ -

Accident Cost Savings (Mid-block Only)

Update Factor **1.09**
Urban mid-block = $b_0 * Q^{b_1} * L$ assume $b_1 = 1.0$ for the purpose of this calculation, this reduce the equation to exposure.
 b_0 **0.0000299** Assume travel is predominately on Primary and Secondary Collectors

Rural mid-block = $b_0 * L * AADT^{365/10^8}$
 b_0 **8** National Strategic (High Volume)

Cost per injury cr: \$ **275,000** 50km/h
 Cost per injury cr: \$ **585,000** 100 km/h

Assume **20%** Rural mid-block **80%** Urban Mid-block

Exposure (AADT reduced * L)

	Workplace (km)	School - Primary (km)	School - Secondary	Community
Package A	-	-	-	-
Package B	-	-	-	-
Package C	32,509.24	-	-	-
Package D	-	-	-	-
Package E	-	-	-	-
Package C-B	-	-	-	-

Benefits

	Workplace	School - Primary	School - Secondary	Community	Total
Package A	\$ -	\$ -	\$ -	\$ -	\$ -
Package B	\$ -	\$ -	\$ -	\$ -	\$ -
Package C	\$ 213,846	\$ -	\$ -	\$ -	\$ 213,846
Package D	\$ -	\$ -	\$ -	\$ -	\$ -
Package E	\$ -	\$ -	\$ -	\$ -	\$ -
Package C-B	\$ -	\$ -	\$ -	\$ -	\$ -

Monetised Benefits and Costs Manual Method
Average Annual Benefit Summary Table (Stage 1 - excluding time)

Step 3: Benefits

	Walking & Cycle VOC	Travel Time Savin	Vehicle Emission	Crash cost savin	Total	
Package A	\$ 1,584,565	\$ 2,305,861	\$ 4,702,147	\$ 92,234	\$ 134,831	\$ 8,819,439
Package B	\$ 2,077,955	\$ 4,124,515	\$ 6,722,369	\$ 164,981	\$ 239,476	\$ 13,329,295
Package C	\$ 2,097,999	\$ 4,353,924	\$ 7,213,476	\$ 174,157	\$ 252,701	\$ 14,092,257
Package D	\$ 2,479,160	\$ 4,649,170	\$ 8,633,231	\$ 185,967	\$ 270,828	\$ 16,218,356
Package E	\$ 2,921,662	\$ 5,052,330	\$ 9,947,148	\$ 202,093	\$ 294,993	\$ 18,418,226
Package C - B	\$ 2,097,999	\$ 3,286,209	\$ 6,025,662	\$ 131,448	\$ 191,148	\$ 11,732,466
Package E (Wider)	\$ 5,074,794	\$ 2,951,994	\$ 9,359,307	\$ 118,080	\$ 176,664	\$ 17,680,840
Package C (Parking Levy)	\$ 183,975	\$ 3,709,402	\$ 5,689,711	\$ 148,376	\$ 213,846	\$ 9,945,310

Secondary School Benefits
\$ 2,447,207
\$ 2,447,207
\$ 2,447,207
\$ 3,874,669
\$ 3,874,669
\$ 2,447,207
\$ 4,806,358
\$ -

Step 3: Capital and Operational Costs

Package	Cost											Average
	Total	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
Package A	49,258,000	3,430,000	3,446,000	5,873,750	5,676,500	5,874,250	5,002,000	4,934,750	4,937,500	5,140,250	4,943,000	4,925,800
Package B	53,678,000	5,030,000	3,631,000	6,058,750	6,026,500	6,224,250	5,352,000	5,284,750	5,287,500	5,490,250	5,293,000	5,367,800
Package C	56,513,000	5,355,000	4,056,000	6,818,750	6,221,500	6,419,250	5,547,000	5,469,750	5,472,500	5,675,250	5,478,000	5,651,300
Package D	66,813,000	6,442,500	5,243,500	8,231,250	7,134,000	7,331,750	6,584,500	6,407,250	6,410,000	6,612,750	6,415,500	6,681,300
Package E	81,741,000	8,177,500	6,872,500	9,936,000	8,789,500	8,593,000	7,971,500	7,795,000	7,798,500	8,002,000	7,805,500	8,174,100
Package C - B	52,093,000	-	-	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Fares	-	-	-	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000

442,000
NPV: \$ 11,970,771

Step 4: Calculate BCR and sensitivity tests

Step 1 Calculation

Sensitivity Tests

Growth:	0.778%	Note: enter growth rate	0.778%
Package Price	100%		
Diversion Rate	0%	Factor increases the diversion rates in forecast	
Reach	100%	Note: this adjusts the target population	
Discount Factor	4%		
Decongestion Benefits	1	Note: change col R for no. of year of current, disruption and future state.	
Benefit Factors	Manual	Note: will spread the cost factor over the 10 years	

Value Costs

Year (from 1 July of)	Year	Discount factor (x%)	Growth Rate (from 2018 being 1)	Benefit Factors	Cost Factor	Enduring Secondary School Benefits	Package A		Package B		Package C		Package D		Package E			Package C - B	
							Cost	Benefits	Cost	Benefits	Cost	Benefits	Cost	Benefits	Cost	Benefits	Wider Benefits	Cost	Benefits
2020	0	1.000	1.016																
2021	1	0.962	1.023																
2022	2	0.925	1.031	0.25	1.0	0	\$ 4,925,800	\$ 8,917,327	\$ 5,367,800	\$ 13,427,184	\$ 5,651,300	\$ 14,190,146	\$ 6,681,300	\$ 16,373,343	\$ 8,174,100	\$ 18,573,213	\$ 17,873,094	\$ 5,209,300	\$ 11,830,354
2023	3	0.889	1.039	0.75	1.0	0.08	\$ 4,925,800	\$ 9,015,215	\$ 5,367,800	\$ 13,525,072	\$ 5,651,300	\$ 14,288,034	\$ 6,681,300	\$ 16,528,330	\$ 8,174,100	\$ 18,728,200	\$ 18,065,348	\$ 5,209,300	\$ 11,928,242
2024	4	0.855	1.047	1.00	1.0	0.12	\$ 4,925,800	\$ 9,113,103	\$ 5,367,800	\$ 13,622,960	\$ 5,651,300	\$ 14,385,922	\$ 6,681,300	\$ 16,683,317	\$ 8,174,100	\$ 18,883,186	\$ 18,257,603	\$ 5,209,300	\$ 12,026,131
2025	5	0.822	1.054	1.00	1.0	0.16	\$ 4,925,800	\$ 9,210,992	\$ 5,367,800	\$ 13,720,849	\$ 5,651,300	\$ 14,483,810	\$ 6,681,300	\$ 16,838,303	\$ 8,174,100	\$ 19,038,173	\$ 18,449,857	\$ 5,209,300	\$ 12,124,019
2026	6	0.790	1.062	1.00	1.0	0.20	\$ 4,925,800	\$ 9,308,880	\$ 5,367,800	\$ 13,818,737	\$ 5,651,300	\$ 14,581,699	\$ 6,681,300	\$ 16,993,290	\$ 8,174,100	\$ 19,193,160	\$ 18,642,111	\$ 5,209,300	\$ 12,221,907
2027	7	0.760	1.070	1.00	1.0	0.24	\$ 4,925,800	\$ 9,406,768	\$ 5,367,800	\$ 13,916,625	\$ 5,651,300	\$ 14,679,587	\$ 6,681,300	\$ 17,148,277	\$ 8,174,100	\$ 19,348,147	\$ 18,834,366	\$ 5,209,300	\$ 12,319,795
2028	8	0.731	1.078	1.00	1.0	0.28	\$ 4,925,800	\$ 9,504,657	\$ 5,367,800	\$ 14,014,513	\$ 5,651,300	\$ 14,777,475	\$ 6,681,300	\$ 17,303,264	\$ 8,174,100	\$ 19,503,133	\$ 19,026,620	\$ 5,209,300	\$ 12,417,684
2029	9	0.703	1.086	1.00	1.0	0.32	\$ 4,925,800	\$ 9,602,545	\$ 5,367,800	\$ 14,112,402	\$ 5,651,300	\$ 14,875,363	\$ 6,681,300	\$ 17,458,250	\$ 8,174,100	\$ 19,658,120	\$ 19,218,874	\$ 5,209,300	\$ 12,515,572
2030	10	0.676	1.093	1.00	1.0	0.36	\$ 4,925,800	\$ 9,700,433	\$ 5,367,800	\$ 14,210,290	\$ 5,651,300	\$ 14,973,252	\$ 6,681,300	\$ 17,613,237	\$ 8,174,100	\$ 19,813,107	\$ 19,411,129	\$ 5,209,300	\$ 12,613,460
2031	11	0.650	1.101	1.00	1.0	0.40	\$ 4,925,800	\$ 9,798,321	\$ 5,367,800	\$ 14,308,178	\$ 5,651,300	\$ 15,071,140	\$ 6,681,300	\$ 17,768,224	\$ 8,174,100	\$ 19,968,094	\$ 19,603,383	\$ 5,209,300	\$ 12,711,348
Total					10.000		\$ 49,258,000	\$ 93,578,241	\$ 53,678,000	\$ 138,676,809	\$ 56,513,000	\$ 146,306,428	\$ 66,813,000	\$ 170,707,834	\$ 81,741,000	\$ 192,706,533	\$ 187,382,385	\$ 52,093,000	\$ 122,708,512

Parking Levy		
Cost	Benefits	Revenue
\$ 1,896,233		\$ 14,850,412
\$ 1,221,500		\$ 24,110,863
\$ 2,159,867	\$ 9,945,310	\$ 28,490,709
\$ 1,328,785	\$ 9,945,310	\$ 28,426,659
\$ 1,328,785	\$ 9,945,310	\$ 28,362,610
\$ 1,328,785	\$ 9,945,310	\$ 28,298,561
\$ 11,921,525	\$ 49,726,551	\$ 152,539,814

Present Value Costs

Year (from 1 July of)	Year	Discount factor (x%)	Growth Rate (from 2018 being 1)	Benefit Factors	Cost Factor	Enduring Secondary School Benefits	Package A		Package B		Package C		Package D		Package E			Package C - B	
							Cost	Benefits	Cost	Benefits	Cost	Benefits	Cost	Benefits	Cost	Benefits	Wider Benefits	Cost	Benefits
-1		1.040																	
0		1.000																	
1		0.962					\$ 4,554,179	\$ 2,125,267	\$ 4,962,833	\$ 3,200,101	\$ 5,224,945	\$ 3,381,938	\$ 6,177,237	\$ 3,902,260	\$ 7,557,415	\$ 4,426,555	\$ 4,259,695	\$ 4,816,291	\$ 2,819,529
2		0.925					\$ 4,379,018	\$ 2,044,626	\$ 4,771,955	\$ 3,068,497	\$ 5,023,985	\$ 3,098,983	\$ 5,939,651	\$ 3,744,783	\$ 7,266,745	\$ 4,292,581	\$ 4,153,439	\$ 4,631,049	\$ 2,862,411
3		0.889					\$ 4,210,594	\$ 1,953,449	\$ 4,588,418	\$ 2,988,395	\$ 4,830,755	\$ 2,911,013	\$ 5,711,203	\$ 3,642,481	\$ 6,987,255	\$ 4,094,694	\$ 3,934,987	\$ 4,452,931	\$ 2,759,720
4		0.855					\$ 4,048,649	\$ 1,862,950	\$ 4,411,940	\$ 2,911,537	\$ 4,644,957	\$ 2,822,778	\$ 5,491,542	\$ 3,493,361	\$ 6,718,514	\$ 3,999,937	\$ 3,899,057	\$ 4,281,665	\$ 2,607,602
5		0.822					\$ 3,892,931	\$ 1,771,708	\$ 4,242,250	\$ 2,822,687	\$ 4,466,304	\$ 2,731,185	\$ 5,280,328	\$ 3,386,691	\$ 6,460,110	\$ 3,892,459	\$ 3,809,860	\$ 4,116,985	\$ 2,506,165
6		0.790					\$ 3,743,203	\$ 1,687,757	\$ 4,079,087	\$ 2,731,776	\$ 4,294,524	\$ 2,641,149	\$ 5,077,239	\$ 3,293,471	\$ 6,211,644	\$ 3,802,211	\$ 3,714,450	\$ 3,958,640	\$ 2,401,374
7		0.760					\$ 3,599,234	\$ 1,602,123	\$ 3,922,199	\$ 2,641,733	\$ 4,129,350	\$ 2,546,582	\$ 4,881,960	\$ 3,198,695	\$ 5,972,735	\$ 3,699,140	\$ 3,623,875	\$ 3,806,384	\$ 2,297,195
8		0.731					\$ 3,460,802	\$ 1,517,831	\$ 3,771,345	\$ 2,546,485	\$ 3,970,528	\$ 2,451,394	\$ 4,694,193	\$ 3,093,354	\$ 5,743,014	\$ 3,593,188	\$ 3,548,176	\$ 3,659,985	\$ 2,180,926
9		0.703					\$ 3,327,694	\$ 1,433,903	\$ 3,626,293	\$ 2,451,959	\$ 3,817,816	\$ 2,358,496	\$ 4,513,647	\$ 2,999,433	\$ 5,522,129	\$ 3,484,294	\$ 3,437,386	\$ 3,519,216	\$ 2,094,101
10		0.676					\$ 3,199,706	\$ 1,358,355	\$ 3,486,821	\$ 2,358,079	\$ 3,670,977	\$ 2,267,795	\$ 4,340,045	\$ 2,908,914	\$ 5,309,739	\$ 3,428,394	\$ 3,342,531	\$ 3,383,862	\$ 2,040,851
Total							\$ 38,416,010	\$ 68,951,969	\$ 41,863,141	\$ 102,095,249	\$ 44,074,140	\$ 107,702,313	\$ 52,107,046	\$ 125,740,442	\$ 63,749,301	\$ 141,907,453	\$ 138,063,457	\$ 40,627,009	\$ 90,360,026

Parking Levy		
Cost	Benefits	Revenue
\$ -	\$ -	\$ -
\$ -	\$ -	\$ -
\$ 1,620,908	\$ -	\$ -
\$ 1,003,984	\$ -	\$ -
\$ 1,706,974	\$ -	\$ 12,466,767
\$ 1,009,767	\$ 8,086,652	\$ 19,604,833
\$ 970,930	\$ 7,832,147	\$ 22,437,051
\$ 933,587	\$ 7,585,258	\$ 21,680,926
\$ 897,680	\$ 7,345,773	\$ 20,949,101
\$ 863,153	\$ 7,113,490	\$ 20,240,851
\$ 9,006,983	\$ 37,963,321	\$ 117,379,529

BCR excluding PT Fare incentives:	BCR 2.6	BCR 3.4	BCR 3.4	BCR 3.1	BCR 2.7	BCR 3.2
Incremental BCR:		BCR A/B 9.6	BCR B/C 2.5	BCR C/D 2.2	BCR (including Wider Benefits) 5.4	BCR D/E 1.4
		\$ 33,143,279	\$ 5,607,064	\$ 18,038,129	\$ 16,167,010	\$ 9.7

BCR (Parking Levy + Package C)	9.3
\$ 41,110,352	\$ 263,045,162

Case Study	Initiative	Diversion Rate	Unit
Seattle Children's Hospital TDM Campaign	Travel Plan	6%	SOV Trips
Santa Monica TDM	Mandated employee commute reduction plan	4%	SOV Trips
Commuter Connections, Washington, USA	Targeting commute to workplaces	14%	Vehicle Trips
Austin TDM Programme, Austin, TX USA	Regulatory and soft measures	3.7%	Vehicle Trips
The Mayor's Commute Challenge, USA	Personalised Journey Planning	7.1-9.3%	SOV Trips
Seattle King County Inmotion TDM programme, USA	Residential Campaigns	12-25%	SOV Trips
Sydney Travel Choices, Australia	Commuter Trips	13%	Vehicles No. Entering CBD
Sustainable Travel Towns, UK	PT, Walking and Cycling Infrastructure and soft measures.	7-10%	Car driver trips per resident
TfL	Policy and Regulation (Cordon Charging)	15% in cordon 18% to cordon	Traffic
CAPCOA	Cordon Pricing Scheme	16 - 22%	Vehicles
CAPCOA	Bike Measures	2 - 5%	Commuter Vehicle Trips
38 Cities across the US	Bike Share Programme	20%	Rate of Cycling
San Francisco, USA	Package of bike measures	1 - 4%	VMT
San Francisco, USA	Carshare	7	vehicle miles reduce per person
Oregon, USA	Carshare	0.05 - 0.2%	reduction VMT
CAPCOA	Carshare, Transit and Employer Based	22 - 44%	reduction in SOV mode share
CAPCOA	Guaranteed Ride Home Scheme	4.2 - 21.0%	reduction VMT (Commuter)
US Federal Highway Administration	Parking Management	3 - 29%	reduction VMT

Self reported

San Francisco, USA	Parking Management	0.1 - 4.2%	reduction VMT
Netherlands	Parking Management	5-15% 20-25% with soft measures	Reduction in Car use
Hawke's Bay DHB	Work Place Travel Plans	18% 10%	Reduction Drive-alone rate Reduction Car driver mode share
Seattle Children's Hospital	Work Place Travel Plans		
UK	Personal Journey Planning	4% - 13%	Driver trips
Stuttgart, Germany	Personal Journey Planning	18 to 47%	Increase in PT use
Australia	Personal Journey Planning	4 - 15%	Reduction in Car use
Arlington County, USA	Marketing, education and outreach	8%	Reduction in SOV Trips
Portland, USA	Marketing, education and outreach	9 - 13%	reduction in SOV Trips
Portland, USA	Marketing, education and outreach	10.40%	reduction in SOV Trips
San Francisco, USA	Marketing, education and outreach	4%	reduction in VMT
King County, USA	Marketing, education and outreach	8-33%	reduction in SOV Trips

engagment?