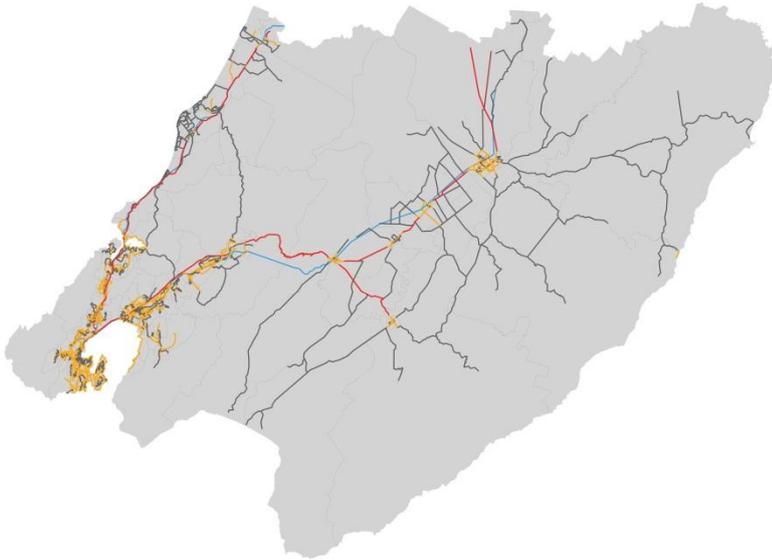


OPUS INTERNATIONAL CONSULTANTS AND ARUP

WELLINGTON TRANSPORT MODELS

Contract No C3079



TN23: Future Year Base Networks and Services Date: December 2012

ARUP



Wellington Transport Models

TN23: Future Year Base Networks and Services

prepared for

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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(Peer Reviewer) _____

Nick Sargent:
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1 Introduction

Opus International Consultants Limited (Opus) and Arup Australia (Arup) were commissioned by Greater Wellington Regional Council (GWRC) to rebase the existing 2006 Wellington Transport Strategy Model (WTSM) to a new base year of 2011. Opus updated the WTSM while Arup developed a Wellington Public Transport Model (WPTM) based on figures from WTSM and detailed public transport surveys. The whole process of model updates and development is complex and involves several steps which have each been individually reported in a series of technical notes.

The purpose of this note is to list and describe in detail the highway and public transport infrastructure improvements that have been included in the 2021, 2031 and 2041 Baseline Future Forecasts that have been produced as part of the WTSM / WPTM commission.

The note has been developed in conjunction with various stakeholders, such as Wellington City Council (WCC), other Territorial Authorities (TAs) within the Greater Wellington Region and NZTA, and also draws upon information in the Greater Wellington Regional Council “Regional Land Transport Programme 2012-2015”¹ (RLTP). The note will serve as a WTSM / WPTM project output and a reference document that can be drawn on by model users and stakeholders in the future.

This note documents the following:

- **Committed Infrastructure Reports.** The infrastructure projects that have been assumed as ‘committed’ (likely to take place over the course of the next 10 years). The list of projects, which can be seen in Table 2-1 below, has been taken from the RLTP i.e. lists ‘third priority, large, new projects commencing within the next 3 years’ (Table 4, Draft RLTP, pg 25) and lists ‘other significant activities expected to commence within the next 10 years’ (Table 5, Draft RLTP for Consultation, pg 25). Details for the highway projects are presented in Appendix A, including coding changes for key schemes implemented in the forecast years.

Each scheme has been categorised as follows:

- Not to be modelled;
- To be modelled, coding exists; and
- To be modelled, further information required; see also WCC clarifications below.
- **Wellington Regional Rail Plan.** The Wellington Regional Rail Plan (RRP) comprises a series of infrastructure and timetabling improvements over the course of the next 10 years, designed to improve the capacity, frequency and reliability of the Wellington rail network.

Three scenarios are to be modelled, based upon the RRP, and are specified below:

- SLS1 – the current status quo, broadly consistent with a 20 to 30 minute headway for all lines during the AM and PM peak periods;

¹ <http://www.gw.govt.nz/assets/Transport/Regional-transport/Draft-RLTP-2012-15-low-res.pdf>

- SLS2 – broadly consistent with a 20 minute headway for all lines during the AM and PM peak periods – 2021 Baseline forecast; and
- SLS3 – broadly consistent with a 15 minute headway for all lines during the AM and PM peak periods – 2031 Baseline forecast.

Whilst at present it is unclear when the SLS2 and SLS3 scenarios might be implemented, it is envisaged that the implementation will be broadly linked to increases in rail patronage, with SLS2 being introduced sometime in the next 10 years followed by SLS3 between 2021 and 2031, subject to projected patronage growth deeming this improvement is worthwhile.

For the purpose of the WTSM baseline future forecasting, SLS2 has been modelled in 2021 and SLS3 in 2031. The detailed service specifications for SLS2 and SLS3 are included in Appendix B.

- **The Wellington City Bus Review.** The “Wellington City Bus Review (WCBR)” forms part of the revised bus networks and constitutes the Baseline bus network for this Baseline Forecasting process. The WCBR comprises of two phases. The first phase includes Wellington City and Southern Suburbs. The second phase is for Northern Suburbs. Each phase consists of:
 - Bus services with high frequencies “frequent core network”;
 - Bus services with relatively low frequencies “secondary services”; and
 - Bus services only available on peak hours “peak-only services”.

The details for the WCBR are included in Appendix C. The WCBR networks are identical for all future years (2021, 2031 and 2041).

2 Schemes

Table 2-1 below summarises the list of infrastructure projects to be included in the Baseline WTSM and WPTM forecast model runs including the Regional Rail Plan in item 20. The WCBR is separately listed in Appendix C.

It is assumed that all included schemes will be completed and operational by 2031. Most schemes will be completed and operational in 2021 – the exceptions being Petone to Granada, both tunnel schemes (Mount Victoria and Terrace) and Transmission Gully (along with associated link roads).

The RoNs schemes are best viewed as a package of roading improvements, designed to improve capacity and reduce journey times along the key north-south corridor between the Airport, Wellington CBD, Porirua, Kapiti and the rest of the North Island. Therefore the full benefits from all the constituent RoNs schemes will not be fully realised until all schemes are fully operational. For cost and logistical reasons, all schemes cannot be progressed at the same time. Therefore, the construction schedule for all schemes has been carefully developed to avoid situations whereby an increase in demand generated by one or more RoNs scheme might result in downstream congestion due to a known bottleneck that will be resolved by another RoNs scheme.

Table 2-1: Significant and Third Priority schemes to be included in WTSM / WPTM Baseline Forecasts

Scheme ID	Name	Modelled Year	Status	Modelling Comments	References
1	Mt Victoria Safety Improvements	2021, 2031	NO	Safety scheme – cannot be modelled	
2	Adelaide Road Improvements	2021, 2031	YES	Coding already exists.	Appendix A
3	SH1 Ruahine Street Widening	2021, 2031	YES	Coding already exists.	Appendix A
4	Aotea Quay Improvements	2021, 2031	YES	Coding already exists.	Appendix A
5	Electronic Integrated Ticketing	2021, 2031	NO	Not to be modelled (see comment below)	
6	SH1 Inner City Bypass Intersection Optimisation	2021, 2031	YES	Coding already exists.	Appendix A
7	SH1 (RoNs) Basin Reserve	2021, 2031	YES	Coding already exists.	Appendix A
8	Johnsonville Triangle Roothing Improvements	2021, 2031	YES	Coding already exists.	Appendix A
9	Ngauranga to Petone Cycleway	2021, 2031	NO	Cycle scheme – mode shift will be minimal, can't model in WTSM	
10	SH2 Carterton to Masterton	2021, 2031	NO	Safety – cannot reasonably be modelled	
11	SH1 Mackays to Peka Peka	2021, 2031	YES	Coding already exists.	Appendix A
12	SH1 (RoNs) Ngauranga to Aotea Quay ATMS	2021, 2031	YES	Extra lane in each direction is required. ATMS component not to be modelled	Appendix A

Scheme ID	Name	Modelled Year	Status	Modelling Comments	References
13	SH2 Ngauranga to SH58 ATMS	2021, 2031	NO	Not to be modelled in WTSM – impact likely to be very small	
14	SH1 (RoNs) Transmission Gully	2031	YES	Coding already exists.	Appendix A
15	SH1 (RoNs) Mt Victoria Tunnel Duplication	2031	YES	Coding already exists.	Appendix A
16	SH1 / SH2 Grenada to Petone	2031	YES	Coding already exists.	Appendix A
17	SH1 (RoNs) Peka Peka to Otaki	2021, 2031	YES	Coding already exists.	Appendix A
18	SH1 (RoNs) Terrace Tunnel Duplication	2031	YES	Coding already exists.	Appendix A
19	SH2 / SH58 Intersection Improvements	2021, 2031	YES	Coding already exists.	Appendix A
20	Regional Rail Plan	2021, 2031	YES	Timetable and infrastructure enhancements.	Appendix B
21	Transmission Gully Link Roads	2031	YES	Coding already exists in TG, 2031 only	Appendix A
22	The Esplanade Upgrade Project	2021, 2031	NO	Small-scale scheme at bottom of Hutt Valley. Will not affect WTSM	
23	Bus Priority Phase 2	2021, 2031	YES	See Section 3	
24	SH1 Otaihanga to Waikanae Safety Improvements Stage 3	2021, 2031	YES	New roundabout at Otaihanga Road / SH1 to be modelled	
25	SH1 Mackays Crossing to Centennial Safety Improvements	2021, 2031	NO	Safety improvements – cannot be modelled	

The impact of electronic integrated ticketing has not been modelled as part of the baseline forecasting exercise for a number of reasons. Firstly, the precise nature of the proposed integrated ticketing scheme is uncertain. Secondly, the process for implementing integrated ticketing into the combined WTSM / WPTM model system has not been fully developed. Whilst a method is being developed to model integrated ticketing in the combined modelling system, the development was not at a sufficiently advanced stage for it to be incorporated into the baseline forecasts.

3 Wellington City Council (“WCC”) Schemes

Following a telephone conversation between Andrew Ford and Stephen Harte of WCC, it was agreed that the schemes outlined below could be included in the baseline forecasts:

Adelaide Road Improvements

The scheme involves the 4-laning of Adelaide Road between the Basin Reserve and John Street, with one lane in each direction being used for a dedicated 24hr bus lane and the other a general traffic lane.

Aotea Quay Improvements

The scheme involves lengthening a number of turning bays and converting the existing signalised intersection at the Tranzrail yard into a roundabout. The main purpose of this improvement is to allow traffic to access the Interislander terminal from the motorway (utilising the roundabout), rather than having to travel via Hutt Road as is currently the case.

Johnsonville Triangle

This scheme comprises a series of planned highway improvements around the Johnsonville Triangle. Moorefield Road and Broderick Road will be widened, increasing the effective capacity from 2 to 4 lanes. Two new signalised junctions will be provided along both Moorefield and Broderick Road to enhance access to / egress from the Johnsonville Mall.

Bus Priority Phase 2

Bus Priority Phase 1 involved the construction of bus lanes primarily within the CBD. Phase 2 extends these bus lanes out to the major suburbs, such as Brooklyn, Karori, Island Bay and Kilbirnie.

At present it is assumed that the Courtenay Place / Kent Terrace / Cambridge Terrace Bus Priority scheme Phase 1 will be included in the Baseline scenario as it is a well advanced scheme that is likely to have an impact upon public transport patronage / journey times and highway journey times.

When the Phase 2 schemes were implemented into the Wellington SATURN Model, they resulted in a significant increase in delays and partial gridlock at key points in the network. Given that the Phase 2 investigations are at an early stage, combined with the fact that any interventions that might result in severe delays for existing road users would be politically unacceptable, the only scheme implemented in the baseline forecasts is full bus priority along the PT spine (Courtenay Place to Wellington Station). Existing capacity for other highway users (cars and HCVs) is maintained along the whole alignment. This method captures the possible benefits from enhanced bus priority along the PT spine whilst not affecting existing highway capacity.

4 Travel Demand Management (TDM)

Present assumption: WTSM assumes the following regarding TDM measures in Wellington:

- 5% of home-based work car trips to the CBD are removed from that segment of the matrix; and
- It is assumed that of this car demand, 80% will switch modes to public transport with the remainder walking / cycling to work or changing their working patterns (i.e. commuting in the Inter peak, working from home).

However, some concern has been expressed that the figure of 5% is perhaps a little too high.

Revised assumption: Based on a review of existing GWRC data and international research, the assumptions have been revised as follows for the Baseline forecasts:

- 3% of home-based work car trips to the CBD are removed from that segment of the matrix; and
- It is assumed that of these trips, 90% will switch to public transport with the remainder walking / cycling to work or changing their working patterns (i.e. commuting in the Inter peak, working from home).

5 Priority Classes

The schemes that are documented in this note and included in the Baseline forecasts are all 'third priority' schemes. This means that they are categorised as 'high cost, new projects costing in excess of \$5m that are deemed of regional and national importance'.

Many first and second priority schemes that are scheduled to take place within the next 10 years have been omitted from Table 2-1. The schemes generally cost a maximum of \$5m, and are primarily related to the following areas of work:

- Maintaining the current highway network (re-surfacing, pavement works, bridge strengthening);
- Minor capital works;
- Improving network resilience (seismic strengthening);
- Improving road safety; and
- Improving walking / cycling infrastructure provision.

Given that WTSM is a strategic model, the effects of small scale schemes and general maintenance cannot be captured by the modelling system. Therefore, a decision was taken to only consider modelling 'third priority and other significant schemes' where the impacts on the network would result in demonstrable changes in highway and / or public transport volumes.

6 Other Assumptions

This note covers the infrastructure assumptions that feed into the Baseline forecasting. Other important documents that relate to inputs to the baseline forecasting document are as follows:

- Land Use Assumptions are documented in TN 29
- Forecast Model Parameters are documented in TN 15

Appendix A – Highway Improvement Schemes

This appendix documents the highway and road schemes that will be included in Baseline forecasting.

Table A below shows the Baseline project schemes for years 2021, 2031, and 2041 (although 2041 is not being specifically modelled for the baseline forecasting).

Table A Baseline Highway Schemes – 2021, 2031 and 2041

		2021	2031	2041	Description
1	Basin reserve Improvements	Y	Y	Y	Grade Separation of Basin Reserve is scheduled to be complete by 2016. This scheme should go in parallel with the scheme of Mount Victoria Tunnel duplication and the improvement of Ruahine Street.
2	Mount Victoria Tunnel duplication and improvement of Ruahine Street	N	Y	Y	Two separate but closely linked schemes, involving the duplication of Mount Victoria Tunnel to 2 lanes each way and increasing the number of lanes along Ruahine Street to 2 lanes in each direction.
3	Ngauranga – Aotea Capacity improvement (Nga-Aotea 4L each way all day)	Y	Y	Y	Use of the existing shoulder on the urban motorway as a “fourth lane”. When = all day What = change from 3L to 4L each way See Item 12 of Table 1.
4	Grenada - Grenada to Petone Link	N	Y	Y	This scheme is scheduled to complete by 2023. Where = between Grenada North and Petone roundabout; a new 4-lane link between SH1 and SH2.
5	Lincolnshire Farms	N	Y	Y	The scheme of “Lincolnshire Farm” is included in the “Grenada to Petone Link” scheme and is scheduled to complete by 2023. The scheme consists of a series of link roads associated with a proposed new development and is documented and described in more detail below.
6	SH2/SH58 Grade separation	Y	Y	Y	This scheme is scheduled to complete by 2021.
7	MacKays Crossing to Peka Peka (M2PP)	Y	Y	Y	This scheme is scheduled to complete by 2019. A new 4-lane expressway with a design speed of 100 km/hr and a capacity at 1400 veh/hr per lane.

		2021	2031	2041	Description
8	Peka Peka to Otaki (PP20)	Y	Y	Y	This scheme is scheduled to complete by 2019. A new 4-lane expressway with a design speed of 100 km/hr and a capacity at 1400 veh/hr per lane.
9	Linden to MacKays (Transmission Gully)	N	Y	Y	This scheme is scheduled to complete by 2023. A new 4-lane expressway between Linden and MacKay's Crossing with speed varying between 85 and 100 km/hr.
10	Adelaide Road Improvement	Y	Y	Y	4 Lanes between the Basin Reserve and John Street with one lane being a 24h bus lane and the other a general traffic lane.
11	Johnsonville Triangle	Y	Y	Y	4 Laning of Moorefield Road and Broderick Road, signalised accesses to Mall.
12	Aotea Quay Improvements	Y	Y	Y	Roundabout at Tranzrail yard access.
13	Terrace Tunnel Duplication	N	Y	Y	2-laning southbound direction.
14	SH1 Otaihanga Round-about	Y	Y	Y	New Roundabout at SH1 /Otaihanga Road.
15	ICB Improvements	Y	Y	Y	Road improvement around the Inner City Bypass and Basin Reserve.

Assumptions for the highway schemes including road type, lanes, speed, vehicle capacity, and interchanges are stated below.

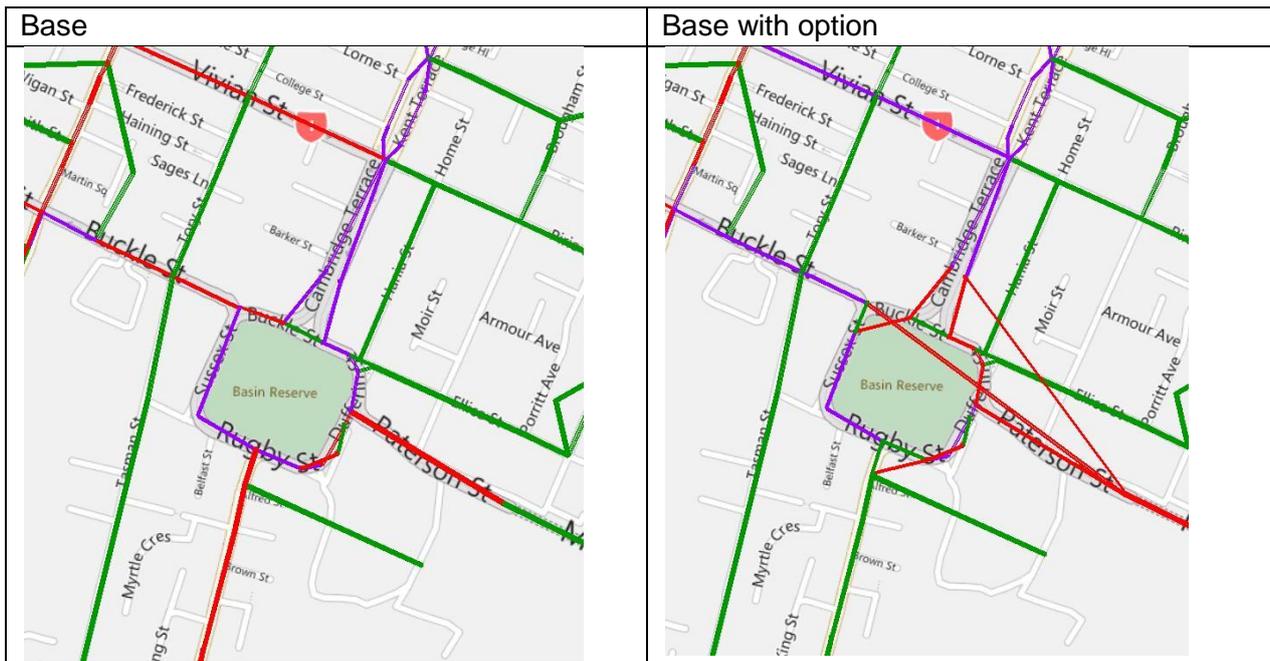
Basin Reserve Improvements

Two flyovers will be built over Kent and Cambridge Terraces. An eastbound link will be connected between Kent Terrace and Mount Victoria Tunnel and a westbound link will be built between Mount Victoria Tunnel and Cambridge Terrace.

Both links will be type 9 (urban arterial – medium speed) with a free flow speed of 55 km/hr and a lane capacity of 1450 veh/hr with the curve parameter of 0.8.

The link type around the Basin will remain the same (type=8). In the plots below (and subsequent plots in this Appendix), the carriageway width is represented as follows:

- Green = one lane;
- Red = two lanes; and
- Purple = three + lanes.



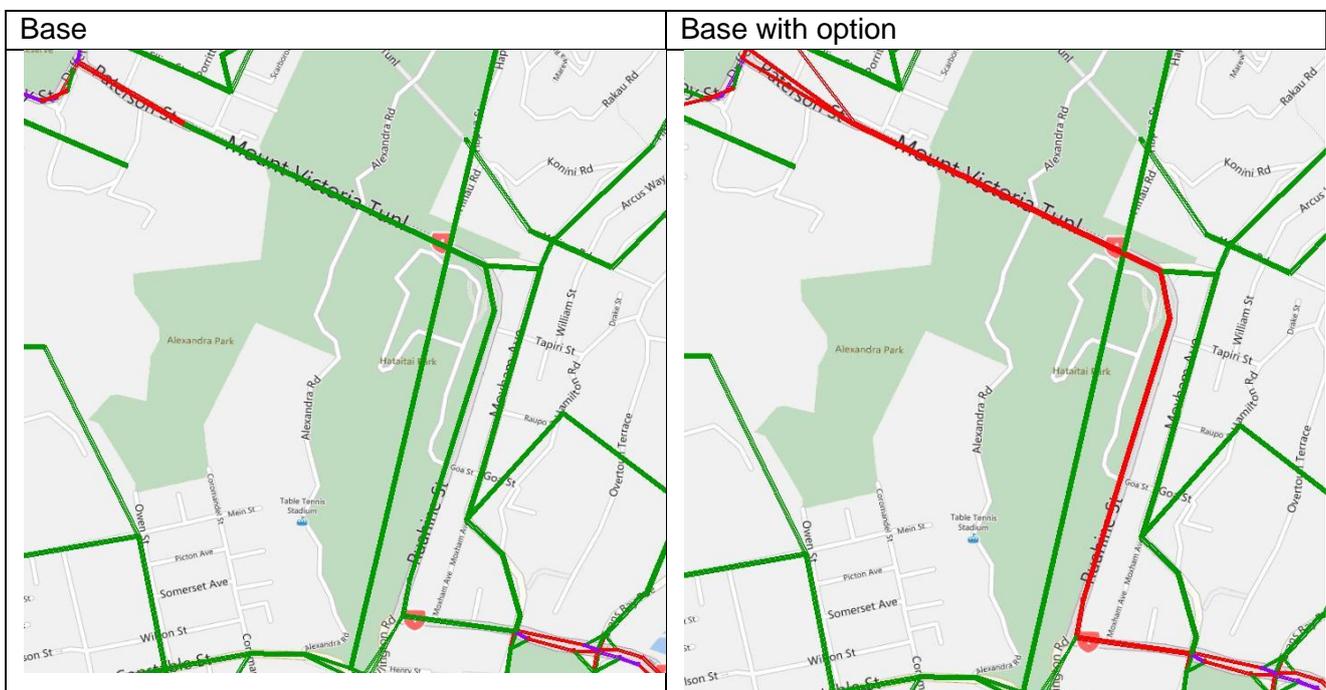
Related bus lane coding around the Basin Reserve is discussed in Section 3.

Mount Victoria Tunnel Duplication and Ruahine Street Improvements

The Basin Reserve improvements are complimented by the Mount Victoria Tunnel duplication and Ruahine Street improvements. These three projects will serve to alleviate congestion and improve travel times on the busy stretch of SH1 between Wellington Airport, Wellington CBD and the Terrace Tunnel.

The two projects involve duplicating Mount Victoria Tunnel (from one lane each way to two lanes each way) and increasing the number of lanes on Ruahine Street between Taurima Street and Wellington Road from one lane each way to two lanes each way with localised intersection approach widening and new signals at Wellington Road / Ruahine Street.

The link type will be type 9 (urban arterial – medium speed) with free flow speed of 55 km/hr and link capacity of 1450 veh/hr and the curve parameter at 0.8.



Ngauranga to Aotea Capacity Improvement

This project will increase capacity on the existing State Highway 1 between the SH1 / SH2 interchange and Aotea Quay off / on ramps from three lanes each way to four lanes each way.

For modelling purposes the link type, speed limit and lane capacity remain the same as is in the current model. There is potential that these assumptions could be revisited once more detailed design information becomes available from work currently being undertaken by Beca.

Grenada - Gracefield Western

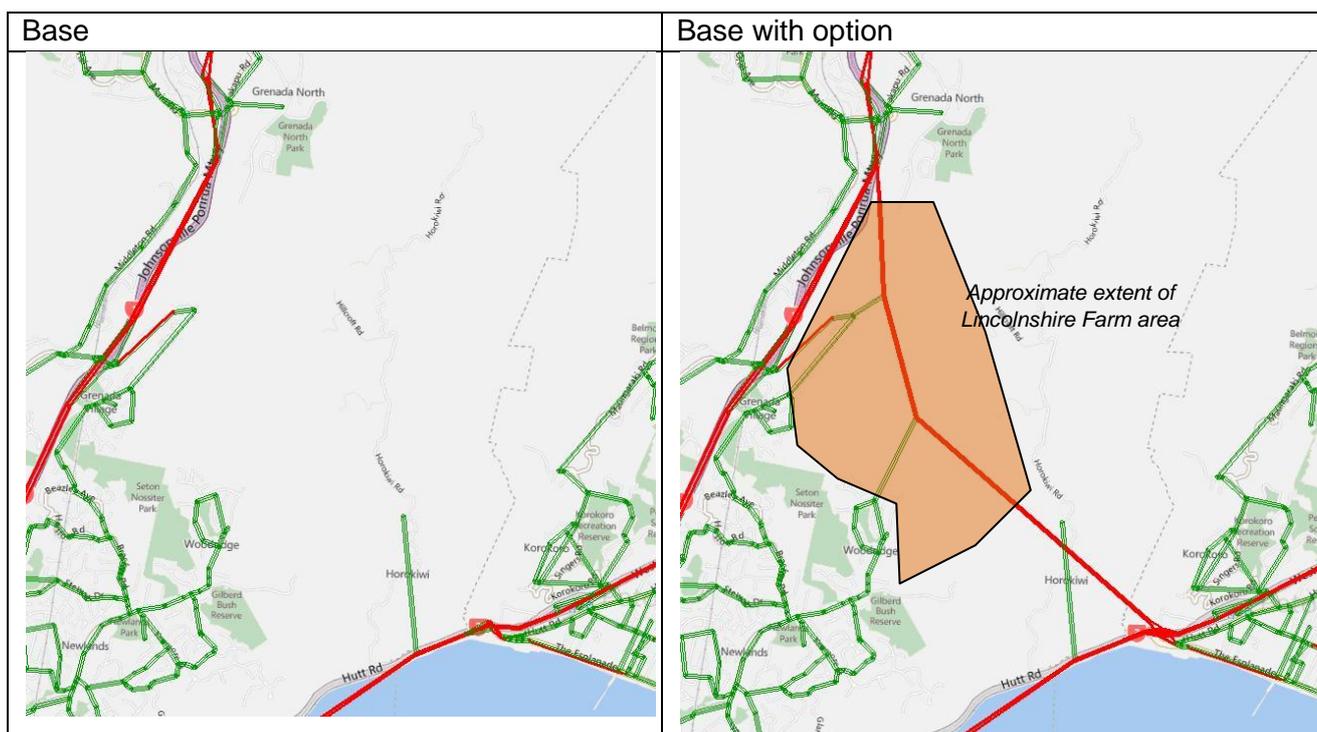
It is also known as the Grenada – Petone link (a link between Petone and Grenada North) with two lanes each way with full grade separation at both ends.

The link type will be type 14 (rural – restricted speed) with free flow speed of 70 km/hr and a lane capacity of 1400 veh/hr and the curve parameter at 1.4.

Lincolnshire Farm

Lincolnshire Farm is an area towards the northern end of the proposed Grenada to Petone (see shaded area below). The Lincolnshire Farm network will connect with the Grenada to Petone Link as it is not considered practical for this new development to proceed without linkages to the Grenada to Petone Link.

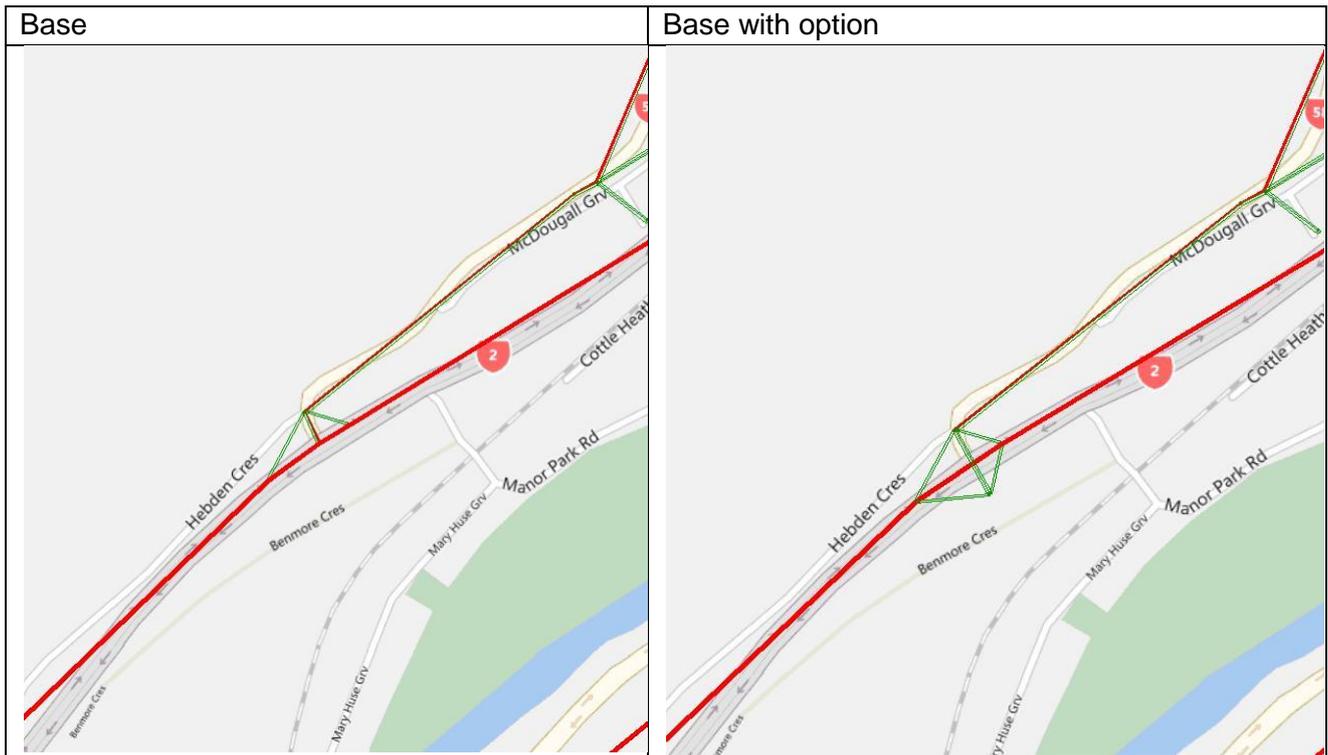
The link connecting “Lincolnshire Farm” and “Grenada to Petone Link” is one lane each way. The link type will be 8 (urban arterial – low speed) with free flow speed of 52 km/hr and a lane capacity of 1350 veh/hr and the curve parameter is 1.0.



State Highway 2 and State Highway 58 Grade Separation

A grade separated intersection is proposed for the intersection of SH2 / SH58. The on / off ramps will each be one lane whilst SH2 will have 2 lanes in both directions.

Link type for the on-ramp will be 12 with a free flow speed of 70 km/hr and a lane capacity of 1800 veh/hr and the curve parameter at 0.6. The Link type for the off-ramp is 13 with a free flow speed of 70 km/hr and a lane capacity of 1800 veh/hr and the curve parameter is 0.6.



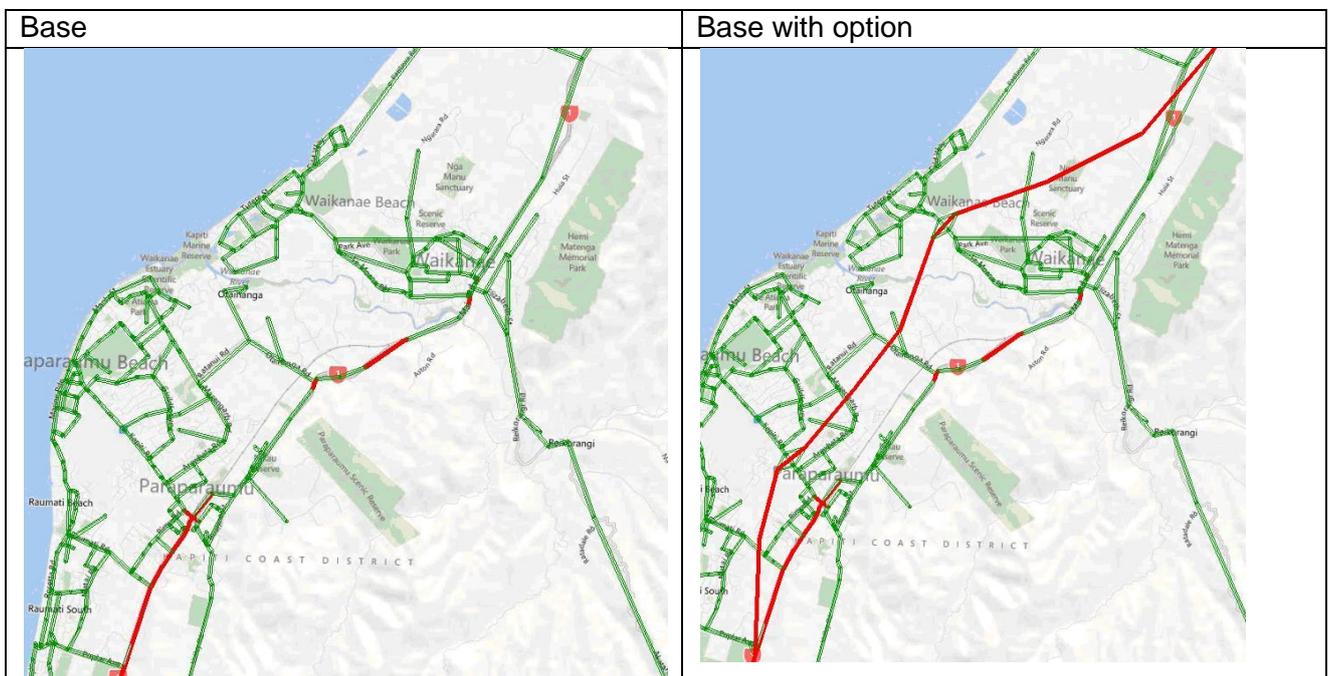
MacKay's Crossing to Peka Peka (M2PP)

M2PP is a new link connecting MacKay's Crossing and Peka Peka to relieve the traffic on SH1.

The new link starts at Poplar Avenue, and connects with local roads with an interchange at Kapiti Road and Te Moana Road; and joins back to SH1 at Peka Peka Road.

The link is type 15 (rural – unrestricted speed) with a free flow speed of 100 km/hr and a lane capacity of 1400 veh/hr - two lanes each way and the curve parameter is 1.4.

There are two full interchanges (one at Kapiti Road and the other one at Te Moana Road) and two half-interchanges at either end (Poplar Avenue and Peka Peka Road).



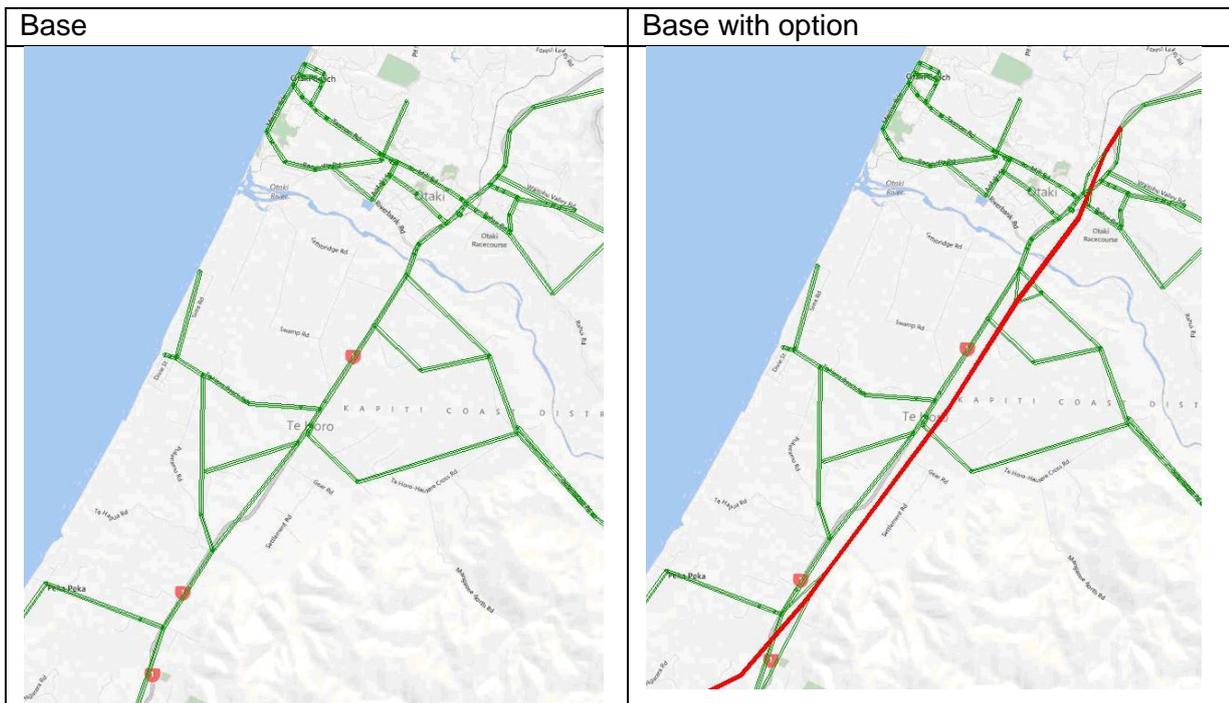
Peka Peka to Otaki (PP20)

PP20 is a new link connecting Peka Peka and Otaki to relieve the traffic on SH1.

It is an extension of the M2PP scheme joining Peka Peka Road and Otaki. PP20 connects Gear Road at south Otaki and merges with SH1 at Mill Road.

The link is type 15 (rural – unrestricted speed) with a free flow speed of 100 km/hr and a lane capacity of 1400 veh/hr - two lanes each way and the curve parameter is 1.4.

There is a half-interchange connecting South Otaki at Gear Road.

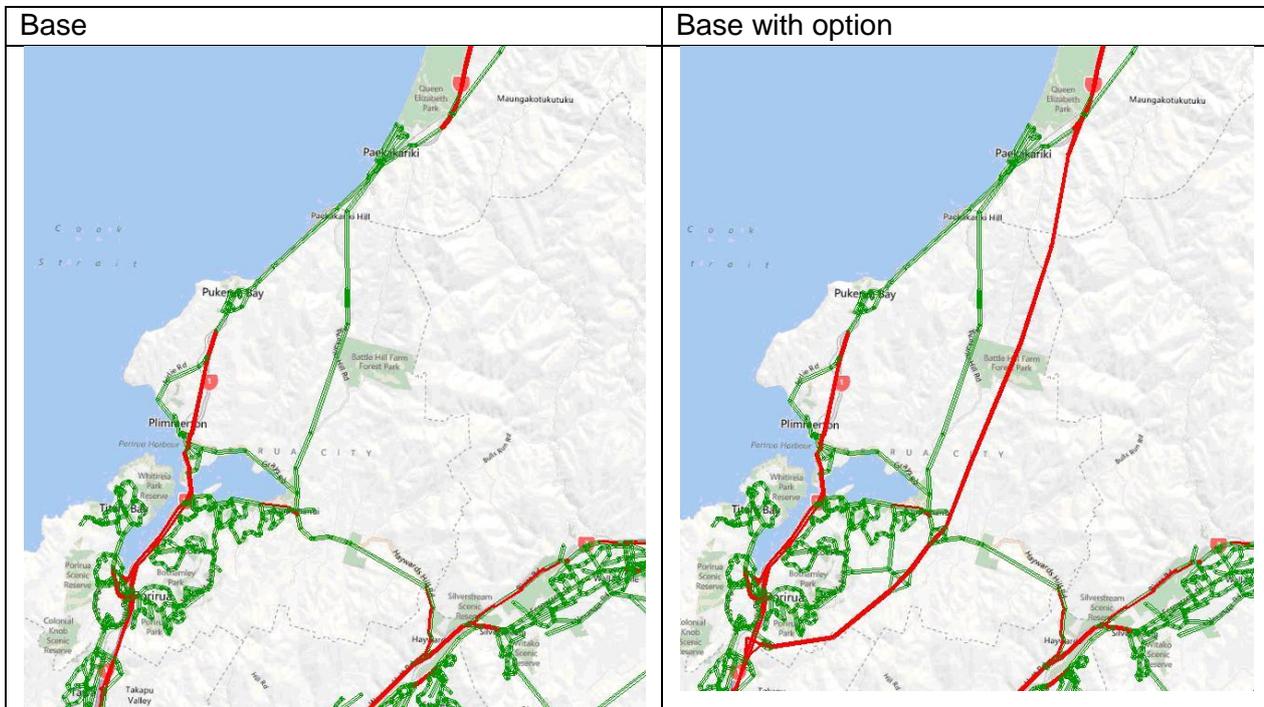


Transmission Gully (TG)

Transmission Gully is part of the RoNs connecting Levin and Wellington airport. This is a link between Paekakariki and Porirua with two lanes each way.

The link type between MacKay's Crossing and Porirua is 11 (motorway) with speed varying between 60 km/hr and 100 km/hr and a lane capacity of 1800 veh/hr and the curve parameter is between 0.2 and 0.8. The lower speed sections (60 km/hr to 80 km/hr) are designed to model the impact that severe gradients (up to 10%) along the Transmission Gully alignment will have upon travel times, vehicle operating costs and route choice.

There are two full-interchanges (one at junction between SH58 and TG and the other is at James Cook Drive) and two half-interchanges at either end of the link (one at MacKay's Crossing and the other at Linden).



Appendix B – Regional Rail Plan Specification

This appendix documents a series of infrastructure and timetabling improvements over the course of the next ten years, designed to improve the capacity, frequency and reliability of the Wellington rail network. The assumptions documented below are correct as of June 2012 and have been incorporated into the baseline forecasts. It is possible, however, that minor changes to these assumptions might occur as a result of modelling and public consultation exercises that are currently ongoing.

The Option 1 service specification outlines the changes to the service assumptions for the WTSM / WPTM baseline forecasting which will be implemented by 2021 to reflect proposed rail infrastructure and rolling stock investment over the next 10 years.

Option 1 (2021) – SLS2 Service Specification

EMME Line ID	Rail Line	Direction	Service Variant	Stopping Pattern	Stops at Kaiwharawhara (K) / Nguaranga(N)	Headway	Run-time	Rolling Stock
AM Peak								
901a_SS2	JVL	Inbound	Johnsonville – W	All		17	21	60/40
902a_SS2	JVL	Outbound	W - Johnsonville	All		15	21	60/40
903a_SS2	KPL	Inbound	Waikanae – W	All to Plimmerton, Porirua		20	54	60/40
904a_SS2	KPL	Inbound	Plimmerton - W	Mana, Paremata, Porirua	K	20	25	60/40
905a_SS2	KPL	Inbound	Porirua - W	All	K	20	21	60/40
906a_SS2	KPL	Outbound	W – Plimmerton	Non-Stop		20	23	60/40
907a_SS2	KPL	Outbound	W – Porirua	Non-Stop		20	17	60/40
908a_SS2	KPL	Outbound	W - Waikanae	All	K	20	60	60/40
909a_SS2	HVL	Inbound	Upper Hutt – W	All to Taita, Waterloo, Wellington		20	38	60/40
910a_SS2	HVL	Inbound	Taita - W	All		20	26	60/40
911a_SS2	HVL	Outbound	W – Upper Hutt	All	KN	30	45	60/40
912a_SS2	HVL	Outbound	W - Taita	Non-Stop		40	25	60/40
913a_SS2	MEL	Inbound	Melling – W	All	KN	20	18	60/40
914a_SS2	MEL	Outbound	W - Melling	All		20	18	60/40
Inter-peak								
901i_SS2	JVL	Inbound	Johnsonville – W	All		60	21	100
902i_SS2	JVL	Outbound	W - Johnsonville	All		60	21	100
903i_SS2	KPL	Inbound	Waikanae – W	All	K	30	60	100
908i_SS2	KPL	Outbound	W - Waikanae	All	K	30	60	100
909i_SS2	HVL	Inbound	Upper Hutt – W	All	KN	30	45	100
911i_SS2	HVL	Outbound	W – Upper Hutt	All	KN	30	45	100
913i_SS2	MEL	Inbound	Melling – W	All	KN	60	18	100
914i_SS2	MEL	Outbound	W - Melling	All	KN	60	18	100
PM Peak								
901p_SS2	JVL	Inbound	Johnsonville – W	All		20	24	60/40
902p_SS2	JVL	Outbound	W - Johnsonville	All		20	21	60/40
903p_SS2	KPL	Inbound	Waikanae – W	All	K	20	60	60/40
904p_SS2	KPL	Inbound	Plimmerton – W	Non-Stop		20	25	60/40
905p_SS2	KPL	Inbound	Porirua - W	Non-Stop		20	21	60/40
907p_SS2	KPL	Outbound	W – Porirua	All	K	20	21	60/40
908a_p_SS2	KPL	Outbound	W - Plimmerton	Porirua, Paremata, Mana		20	25	60/40
908p_SS2	KPL	Outbound	W - Waikanae	Porirua, Plimmerton, All to Waikanae		20	53	60/40
909p_SS2	HVL	Inbound	Upper Hutt – W	All		20	45	60/40
910p_SS2	HVL	Inbound	Taita - W	Non-Stop	KN	20	20	60/40
911p_SS2	HVL	Outbound	W – Upper Hutt	Waterloo, Taita, All to Upper Hutt		20	39	60/40
912p_SS2	HVL	Outbound	W - Taita	All		20	27	60/40

EMME Line ID	Rail Line	Direction	Service Variant	Stopping Pattern	Stops at Kaiwharawhara (K) / Nguaranga(N)	Headway	Run-time	Rolling Stock
913_p_SS2	MEL	Inbound	Melling – W	All		20	18	60/40
914_p_SS2	MEL	Outbound	W - Melling	All	KN	20	18	60/40

The Option 2 service specification outlines the changes to the service assumptions for the WTSM / WPTM baseline forecasting which will be implemented by 2031 to reflect further proposed rail infrastructure and rolling stock investment between 2021 and 2031, building on the enhancements delivered by Option 1.

Option 2 (2031) – SLS2 Service Specification

EMME Line ID	Rail Line	Direction	Service Variant	Stopping Pattern	Stops at Kaiwharawhara (K) / Nguaranga(N)	Headway	Run-time	Rolling Stock
AM Peak								
901a_SS2	JVL	Inbound	Johnsonville – W	All		15	21	60/40
902a_SS2	JVL	Outbound	W - Johnsonville	All		15	21	60/40
903a_SS2	KPL	Inbound	Waikanae – W	All to Plimmerton, Porirua		15	54	60/40
904a_SS2	KPL	Inbound	Plimmerton - W	Mana, Paremata, Porirua	K	15	25	60/40
905a_SS2	KPL	Inbound	Porirua - W	All	K	15	21	60/40
906a_SS2	KPL	Outbound	W – Plimmerton	Non-Stop		15	23	60/40
907a_SS2	KPL	Outbound	W – Porirua	Non-Stop		15	17	60/40
908a_SS2	KPL	Outbound	W - Waikanae	All	K	15	60	60/40
909a_SS2	HVL	Inbound	Upper Hutt – W	All to Taita, Waterloo, Wellington		15	38	60/40
910a_SS2	HVL	Inbound	Taita - W	All		15	26	60/40
911a_SS2	HVL	Outbound	W – Upper Hutt	All	KN	20	45	60/40
912a_SS2	HVL	Outbound	W - Taita	Non-Stop		30	25	60/40
913a_SS2	MEL	Inbound	Melling – W	All	KN	15	18	60/40
914a_SS2	MEL	Outbound	W - Melling	All		15	18	60/40
Inter-peak								
901i_SS2	JVL	Inbound	Johnsonville – W	All		60	21	100
902i_SS2	JVL	Outbound	W - Johnsonville	All		60	21	100
903i_SS2	KPL	Inbound	Waikanae – W	All	K	30	60	100
908i_SS2	KPL	Outbound	W - Waikanae	All	K	30	60	100
909i_SS2	HVL	Inbound	Upper Hutt – W	All	KN	30	45	100
911i_SS2	HVL	Outbound	W – Upper Hutt	All	KN	30	45	100
913i_SS2	MEL	Inbound	Melling – W	All	KN	60	18	100
914i_SS2	MEL	Outbound	W - Melling	All	KN	60	18	100
PM Peak								
901p_SS2	JVL	Inbound	Johnsonville – W	All		15	24	60/40
902_p_SS2	JVL	Outbound	W - Johnsonville	All		15	21	60/40
903_p_SS2	KPL	Inbound	Waikanae – W	All	K	15	60	60/40
904_p_SS2	KPL	Inbound	Plimmerton – W	Non-Stop		15	25	60/40
905_p_SS2	KPL	Inbound	Porirua - W	Non-Stop		15	21	60/40
907_p_SS2	KPL	Outbound	W – Porirua	All	K	15	21	60/40
908a_p_SS2	KPL	Outbound	W - Plimmerton	Porirua, Paremata, Mana		15	25	60/40
908_p_SS2	KPL	Outbound	W - Waikanae	Porirua, Plimmerton, All to Waikanae		15	53	60/40
909_p_SS2	HVL	Inbound	Upper Hutt – W	All		15	45	60/40
910_p_SS2	HVL	Inbound	Taita - W	Non-Stop	KN	15	20	60/40
911_p_SS2	HVL	Outbound	W – Upper Hutt	Waterloo, Taita, All to Upper Hutt		15	39	60/40
912_p_SS2	HVL	Outbound	W - Taita	All		15	27	60/40
913_p_SS2	MEL	Inbound	Melling – W	All		15	18	60/40
914_p_SS2	MEL	Outbound	W - Melling	All	KN	15	18	60/40

Appendix C – Wellington City Bus Review Service Specification

This appendix documents the recommendations of the Wellington City Bus Review (WCBR) in stages.

Stage I: Wellington City and Southern Suburban Core Network Frequencies

Route	Description	Service Span	Midday (minutes)	Peak Hour (minutes)	Midday Saturday (minutes)	Midday Sunday, Holiday (minutes)
A1	Station - CBD - Newtown - Island Bay (branch of A)	7-days 6AM-12AM	15	10	15	15
A2	Station - CBD - Newtown - Zoo (branch of A)	7-days 6AM-12AM	15	15	15	15
B	Karori - CBD - Kilbirnie - Mirimar Nth	7-days 6AM-12AM	10	6	15	15
Bs	Karori - Courtenay Pl	M/F 6-9AM, 4-7PM	-	10	-	-
C	Station - Terrace - Newtown - Kilbirnie - Seatoun	7-days 6AM-12AM	10	10	15	15
D1	Brooklyn - Kingston (non-core branch of D)	7-days 6AM-12AM	30	30	30	30
D2	Brooklyn - Kowhai Park (non-core branch of D)	7-days 6AM-12AM	30	30	30	30
F	Lower Hutt – Airport	7-days 530AM-830PM	15	15	15	15

Secondary Network Frequencies

Route	Description	Service Span	Midday Weekday (minutes)	Peak Hour (minutes)	Midday Saturday (minutes)	Midday Sunday, Holidays (minutes)
12	Courtenay Pl-CBD-Khandallah-Broadmedowns-Johnsonville	M/F 6AM-11PM Sat/Sun 7AM-11PM	60	30	60	60
14	Northland - CBD - Oriental Pde - Hataitai		30	15	30	30
15	Lyal Bay - Oriental Pde - CBD - Khandallah	M/F 6AM-11PM Sat/Sun 7AM-12PM	30	15	30	30
16s	Station - Terrace - Kelburn - Zealandia	M/F 8-10AM	--	20	--	--
16	Station - Terrace - Kelburn - Zealandia - Wrights Hill - Karori (see 16-17)	M/F 6AM-8PM	30	30	--	--
17	Station - Terrace - Kelburn - Zealandia - Northland - Crofton Downs (see 16-17)	M/F 6AM-12AM Sat/Sun 7AM-12AM	30	30	30	30
19	Kelburn - Highbury - Aro St - Courtenay Pl - Mt. Vic. Summit	M/F 6AM-8PM Sat/Sun 7AM-8PM	30	20	30	30
24	Miramar - Maupuia - Nevay Rd. Loop	M/F 6AM-8PM Sat/Sun 7AM-8PM	60	20	60	60
25	Miramar - Strathmore	M/F 6AM-12AM Sat/Sun 7AM-12AM	30	15	30	30
29	Brooklyn-Owhiro Bay-Zoo Loop	M/F 6AM-12AM Sat/Sun 7AM-8PM	30	30	60	60

Peak only services

Route	Description	Service Span (M/F for all)	Peak AM Hour (7 AM) (minutes)	Peak PM Hour (5 PM) (minutes)
27	Karori South	7-8AM / 4-6PM	20	60
28	Miramar South-Breaker Bay	7-9AM / 4-7PM	20	20
30	Station-Moa Point OR Breaker Bay	7-9AM / 4-7PM	30	15
31	Station-Miramar	7-9AM / 4-7PM	12	15
32	Station-Houghton Bay	7-9AM / 4-6PM	12	20
34	Station-Owhiro Bay	7-8AM / 4-7PM	12	15
36	Station-Lyall Bay	7-9AM / 4-6PM	20	12
45	Station-Khandallah	7-9AM / 4-7PM	20	20

Stage II: Northern Suburb Frequent Core network

Route	Description	Service Span	Midday Weekday (minutes)	Peak Hour (minutes)	Midday Saturday (minutes)	Midday Sunday, Holidays (minutes)
H	Johnsonville – Newlands – CBD – Courtenay	7-days 6AM-12AM	15	15	15	15
--	Johnsonville Rail Line (included for comparison)	M/Th 6AM-11PM Fri 6AM-1AM Sat 6AM-1AM Sun 6AM-11PM	30	17	30 to 60	30 to 60

Secondary Network Frequencies

Route	Description	Service Span	Midday Weekday (minutes)	Peak Hour (minutes)	Midday Saturday (minutes)	Midday Sunday, Holidays (minutes)
51	Johnsonville - Churton Park - Grenada Vlg. - Newlands	M/F 6AM-12AM Sat/Sun 7AM-12AM	30	30	30	30
52	Johnsonville - Woodridge - Baylands	M/F 6AM-12AM Sat/Sun 7AM-12AM	30	30	30	60
53	Johnsonville West	M/F 6AM-8AM Sat 7AM-9PM Sun 7AM-8PM	30	30	60	60

Peak only Services

Route	Description	Service Span (M/F for all)	Peak AM Hour (7 AM) (minutes)	Peak PM Hour (5 PM) (minutes)
Link	Newlands South	7-9AM / 4-7PM	30	30
61	CBD - Johnsonville - Churton Pk express	7-9AM / 4-6PM	12	15
62	CBD - Newlands - Granada Vlg express		15	15
67	CBD - Newlands - Woodbridge express		15	20
68	CBD - Newlands - Baylands express		20	20