



Greater Wellington Regional Council

Hutt Valley Public Transport Review

Options & Recommendations Report

November 2014

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Options & Recommendations Report

Quality Assurance Statement

Prepared by:

Doug Weir

National Specialist – Public Transport



Reviewed by:

Jamie Whittaker

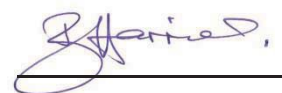
Senior Transportation Planner



Approved for Issue by:

Brett Harries

Managing Director



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PO Box 30-721, Lower Hutt 5040
New Zealand

P: +64 4 569 8497

www.tdg.co.nz

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1. Introduction

This report is the main output of the second and final stage of the Hutt Valley Public Transport Review that TDG has conducted for Greater Wellington Regional Council (GWRC) with the assistance of Ian Wallis Associates. It complements the Data Analysis Report that was produced for the first stage of the review.

This report summarises key issues and options, and provides recommendations for the Hutt Valley bus routes that have been defined as being integral to the public transport network in the 2014 Regional Public Transport Plan, with the exception of the Eastbourne routes, the Hutt Valley night routes, and the Hutt Valley school routes. Routes 110, 111, 112, 114, 115, 120, 121, 130, 145, 150, 154, 160 and 170 are therefore assessed, along with a potential future east-west bus link between the Hutt Valley and Porirua. These are arranged into geographical groupings from south to north to aid the reader. The Eastbourne (Routes 81, 83, 84 & 85), night and school routes fall outside the scope of this stage of the review and are not discussed other than in relation to the routes that are under consideration.

The options provide alternative approaches that address the identified issues, and have been assessed for their viability, although they are not intended to be exhaustive. Other options or combinations of options may also be viable, although many of these have been tested and discarded through the development of the options presented in the report.

Some of the options are expected to result in cost savings if implemented, while others are expected to result in cost increases. The actual cost saving/increase is dependent on operational considerations and the combination of options selected, and may vary in practice from that presented in this report. The final cost to the community and the degree of cost-neutrality is therefore dependent on the mix that is chosen by GWRC.

Recommendations are made for future action or further investigation, based on an assessment of the advantages and disadvantages of each option. The recommendations are intended to provide a guide as to where the most value can be gained.

The report is supported by appendices that contain information that is regarded as being commercially sensitive and are not attached to the public version of this document.

2. Naenae (Route 130)

2.1 Introduction

Route 130 is a core route that runs between Naenae and Petone, via Waterloo, Queensgate and Moera (see Figure 1), and provides high levels of service to several areas.

The previous stage of this review found that Route 130 is generally well-utilised, but determined that capacity, train connections, and the use of the Judd Crescent extension of the route, should be further investigated. These are therefore examined in this section, supported by additional information in Appendix A.

2.2 Route 130 Capacity

Capacity analysis confirms that the affected services are well-used but not overloaded, with patronage on all weekday trips being comfortably within vehicle capacity. No further action is recommended.

From the capacity analysis, we note that the weekday 6:00 northbound trip between Queensgate and Naenae carried only three passengers during March 2014. While this service is primarily used to position a vehicle for the 6:20 southbound trip from Naenae, it is essentially unused by passengers and we recommend that it is discontinued. The vehicle would still need to be positioned for the 6:20 trip, but could be moved directly to Naenae from the depot rather than following the more indirect bus route. The resulting saving would be in the order of 1150km and 37.5 hours per annum.

2.3 Route 130 Train Connections

2.3.1 Issue

Route 130 provides regular train connections at Waterloo Station, which are designed to facilitate bus-train travel between the Naenae-Fairfield area and Wellington. Passenger surveys conducted during the previous stage of this review indicated some dissatisfaction with the reliability of these connections. Train connections can also be made at Naenae Station and Petone Station and for northbound travel from Waterloo Station, but those connections are not noted in the timetables and have not been assessed in this section.

The current timetable notes the Naenae-Wellington connections that can be made within the 4-15 minute window that GWRC uses as a guide. These vary considerably, but are typically around six minutes in the southbound direction (towards Wellington) in the morning peak and nine minutes in other periods, and around eight minutes in the northbound direction (towards Waterloo and Naenae via the connecting bus) in the afternoon peak and six minutes in other time periods.



Figure 1: Route 130 Route Map

Train performance in terms of meeting the scheduled arrival/departure times at Waterloo Station is unavailable, but analysis of Real Time Information System data for Route 130 from March 2014 provides some indication of the bus performance against these connections, as shown in Table 1.

Train Connections for Weekday Route 130 Trips Departing Naenae Southbound	Train Connections for Weekday Route 130 Trips Departing Naenae Northbound
<ul style="list-style-type: none"> • Eleven southbound trips run more than three minutes behind their scheduled time at Waterloo Station - the 7:00, 7:20, 7:35, 8:20, 8:45, 9:00, 9:15, 11:45, 12:45, 14:30 and 17:30 departures from Naenae • All of the above trips warrant further investigation, particularly the 8:20 and 9:15 trips, which run more than six minutes late at Waterloo on average, but only the 7:00, 7:20, 7:35, 9:00, 14:30 and 17:30 trips have timetabled train connections, which they are likely to experience problems with if connecting trains are running to timetable • The 7:00 trip runs 3.39¹ minutes late on average, but has a timetabled six minute connection time at Waterloo, so the connection is less than the four minute threshold and very marginal at 2.61 minutes • The 7:20 trip runs 3.63 minutes late on average, but has a timetabled four minute connection time at Waterloo, so the connection is less than the four minute threshold and unviable at 0.37 minutes (22 seconds) • The 7:35 trip runs 4.27 minutes late on average, but has a timetabled eleven minute connection time at Waterloo, so the connection remains sufficient at 6.73 minutes • The 9:00 trip runs 3.31 minutes late on average, but has a timetabled nine minute connection time at Waterloo, so the connection remains sufficient at 5.69 minutes • The 14:30 trip runs 3.22 minutes late on average, but has a timetabled nine minute connection time at Waterloo, so the connection remains sufficient at 5.78 minutes • The 17:30 trip runs 3.35 minutes late on average, but has a timetabled nineteen minute connection time at Waterloo, which is outside the 4-15 minute connection window, so it is not a viable connection (even with the delay, which reduces the connection time to 15.65 minutes). 	<ul style="list-style-type: none"> • All northbound trips arrive at Waterloo less than one minute early, which is sufficient for connections from train to bus to be viable if the connecting trains are running to timetable • Thirty northbound trips run more than three minutes late at Waterloo on average, fifteen of which have train connections at that station – the 7:40, 8:40, 9:40, 10:40, 11:40, 12:40, 13:10, 13:40, 14:10, 15:10, 16:05, 16:20, 17:05, 18:10 and 19:10 northbound trips from Petone – which significantly adds to the connection times, moving all above nine minutes and two (the 16:05 and 17:05 trips) above fifteen minutes.

Table 1: Performance of Route 130 Train Connections

¹ Late running times are as shown as decimals in this report, reflecting the output of the Real Time Information system. These can be converted to seconds by multiplying the times by 60.

Route 130 clearly has a reliability issue, which results in late running that affects the bus-train connections at Waterloo. The late running is spread throughout the day (although it does not affect every trip), which suggests that it may relate to the lack of sufficient layover at Petone. Further investigation is required to determine the cause of this issue and the appropriate options to address it.

2.3.2 Recommendations

- (i) Investigate the cause of the Route 130 reliability issue, which affects numerous bus-train connections on weekdays and makes some unviable.
- (ii) Investigate train performance at meeting scheduled arrival/departure times at Waterloo to determine whether these are being delivered to an acceptable standard and allow connections to take place as planned. Particular focus on the performance of northbound train services from Wellington will be required, where the success of bus connections is likely to be heavily influenced by the reliability of rail services at meeting scheduled arrival times at Waterloo.

2.4 Judd Crescent Extension

2.4.1 Issue

The Judd Crescent section of Route 130 in Naenae has been identified as being under-utilised and duplicates other services in the immediate vicinity.

The Naenae area is served by the following services:

- the standard 130 route, which runs to/from the Naenae terminus via Sladden Street, Hewer Crescent, Naenae Road, Rata Street, Hay Street and Waddington Drive to serve most of Naenae on a high frequency, seven days a week basis (shown as the solid line in Figure 2);
- a 4.3 km Judd Crescent extension of the standard route, which is used by four weekday trips that depart Naenae Station at 8:22, 9:47, 11:47 and 15:17 and travel south via Vogel Street and Seddon Street to loop through the Judd Crescent area before returning to Naenae Station (shown as a dashed line in Figure 2), then continuing to Petone via the standard route; and
- Route 121, which travels through Naenae via Naenae Road (shown as a fine grey line in Figure 2).

The Judd Crescent extension serves ten bus stops other than Naenae Station - four on Seddon Street, five on Judd Crescent and one on Naenae Road. Five of these bus stops are located in close proximity to other bus routes that have higher levels of service – the pair of bus stops on Seddon Street at Naenae Park, and the Seddon Street at Waddington Drive, Judd Crescent at Feist Street, and Naenae Road at Vogel Street bus stops. These were essentially unused in March 2014, with only the Judd Crescent at Feist Street bus stop and one of the Seddon Street at Naenae Park bus stops recording boardings (four each over the month) and one of the Seddon Street at Naenae Park bus stops recording alightings (two over the month).

The five remaining bus stops, which are located furthest from Naenae Station and other bus routes (the Seddon Street (near 95), Judd Crescent at Toomath Street, Judd Crescent at

Wilcox Grove, Judd Crescent at Ingram Street, and Judd Crescent at Frethey Grove bus stops) provide 500 metre access to a bus service to 263 households that are located further than 500 metres from the standard 130 route. Their usage is slightly higher than the other bus stops on the Judd Crescent extension, but even they had a combined total of only 0.56 boardings per trip during March 2014. This is less than half the number of boardings on the same trips at the two pairs of bus stops on Waddington Drive that serve the same area, on the standard route south of Naenae Station.

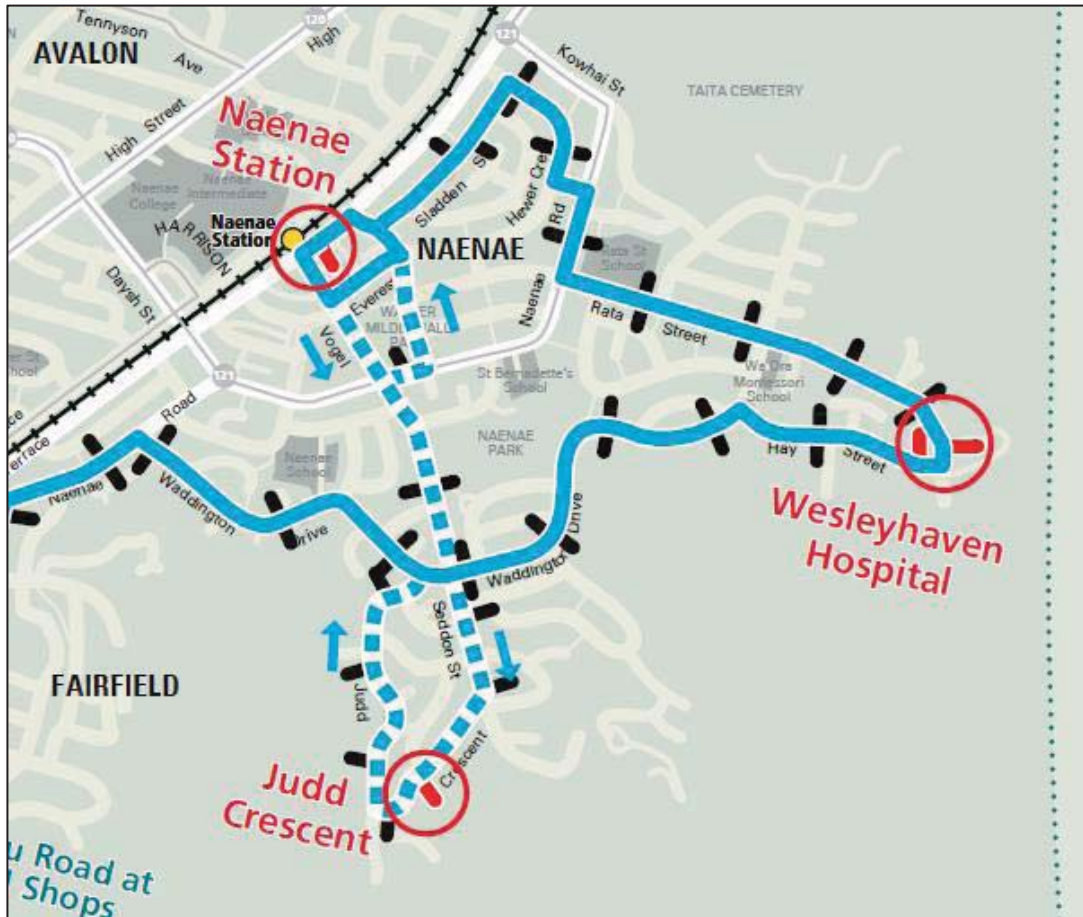


Figure 2: Route 130 in Naenae Showing the Judd Crescent Extension

Most of the Judd Crescent extension boardings are made in the morning, with the 8:22 trip accounting for 44% of total boardings, the 9:47 trip accounting for 25% of total boardings and the 11:47 trip accounting for 22% of total boardings. More than two thirds of the 8:22 trip boardings are made at the Judd Crescent at Wilcox Grove bus stop at the southern end of the loop, and all of those were children during March 2014.

Three quarters of the return journeys were made on the 11:47 trip, with the remainder using the 15:17 trip.

2.4.2 Options

Four options for the Judd Crescent extension are compared in Table 2.

Option	Advantages	Disadvantages
Status quo	<ul style="list-style-type: none"> 263 households continue to have 500 metre access to a bus service that provides basic accessibility. 	<ul style="list-style-type: none"> Poor utilisation of resources, given service cost and low patronage levels.
Discontinue the Judd Crescent extension trips that depart Naenae at 8:22 and 15:17, but retain the 9:47 and 11:47 trips.	<ul style="list-style-type: none"> Would save approximately 2150 km per annum May save 67 hours per annum, depending on whether the current trips are made during the Naenae layover period Would preserve a basic off-peak accessibility service at the times that account for a significant share of current boardings and alightings. 	<ul style="list-style-type: none"> Cost per boarding would reduce, but would still be high Patronage is likely to continue to be low 263 households lose 500 metre access to peak bus services.
Discontinue all Judd Crescent extension trips, but divert two morning and two afternoon trips off the standard route from Waddington Drive via Seddon Street and Judd Crescent	<ul style="list-style-type: none"> Would save approximately 1300 km per annum May save 33 hours per annum, depending on whether the current trips are made during the Naenae layover period Would preserve service to the Judd Crescent area Judd Crescent area patronage may improve, since this option would provide a more direct route to activity centres to the south 	<ul style="list-style-type: none"> Cost per boarding would reduce, but would still be high if patronage didn't improve Would require the southbound trips to depart Naenae earlier and the northbound trips to arrive at Naenae later, which would affect the current clock face timetable Existing standard Route 130 passengers would be adversely affected by a longer travel time, which might reduce patronage on diverted services
Discontinue all Judd Crescent extension trips	<ul style="list-style-type: none"> Would save approximately 4300 km per annum May save 67 hours per annum, depending on whether the vehicle would lay over for the same period or not Would provide a consistent timetable across all Route 130 services, which would be easier to understand. 	<ul style="list-style-type: none"> 263 households lose 500 metre access to a bus service – those residents would have to walk up to 700 metres further to catch services

Table 2: Judd Crescent Extension Options

2.4.3 Recommendations

- (i) Discontinue all Judd Crescent extension trips, but prior to doing that, investigate the option of diverting two morning and two afternoon trips off the standard route from Waddington Drive via Seddon Street and Judd Crescent to determine if that is viable.
- (ii) Current services cannot be justified by existing use, which is very low, but diverting the standard trips would preserve (and potentially enhance) service to 263 households that would otherwise lose 500 metre access to a bus service, although it may affect patronage on the standard route.

3. Western Hills (Routes 145, 150, 154)

3.1 Introduction

Routes 145, 150 and 154 link the Western Hills suburbs of Lower Hutt with other parts of the Hutt Valley. The routes have different catchments and functions:

- Route 145 is a targeted route that runs between Belmont and Queensgate (see Figure 3), at weekday school and commuter peak times only;
- Route 150 is a local route that runs between Kelson and Petone, via Avalon, Epuni, Waterloo, Queensgate, Normandale and Maungaraki (see Figure 4), on relatively low frequencies, seven days a week; and
- Route 154 is a targeted route that runs between Korokoro and Queensgate, via Petone and Alicetown (see Figure 5), at weekday school and commuter peak times only.

The previous stage of this review found that Route 150 performs well, but determined that the low patronage of Routes 145 and 154 should be further investigated. These are therefore examined in this section, supported by additional information in Appendix B.

3.2 Route 145 Services

3.2.1 Issue

Route 145 has been identified as being poorly utilised, with an average of 5.0 boardings per trip across all trips in March 2014. The trips with the highest boardings are those servicing the schools, in particular the 15:42 return trip from Queensgate, with an average of 20.0 boardings per trip, and the 7:11 return trip from Queensgate, with an average of 8.8 boardings per trip.

The route also serves a commuter market, and in the morning, the 6:37, 7:11, 7:36 and 8:27 return trips from Queensgate are reasonably well patronised. However, a lower service level than present is likely to be sufficient to cater to demand, as the 6:12 and 6:46 trips from Belmont, and the 7:55 return trip from Queensgate have an average of 1.4, 1.7 and 1.9 boardings per trip respectively, and none of these has a maximum number of boardings above 6 on any one trip.

Demand is more spread out in the afternoon, with the exception of the 15:42 return trip from Queensgate, which picks up from schools prior to this time and has very high loadings as noted above. The remaining afternoon trips average 3.5 boardings per trip and a lower service level than present is likely to be sufficient to cater to demand.

The current timetable requires two peak vehicles, but given the low boarding levels on some trips this could be reduced to one, to respond to existing demand more efficiently. An alternative timetable that achieves this is shown in Table 3.

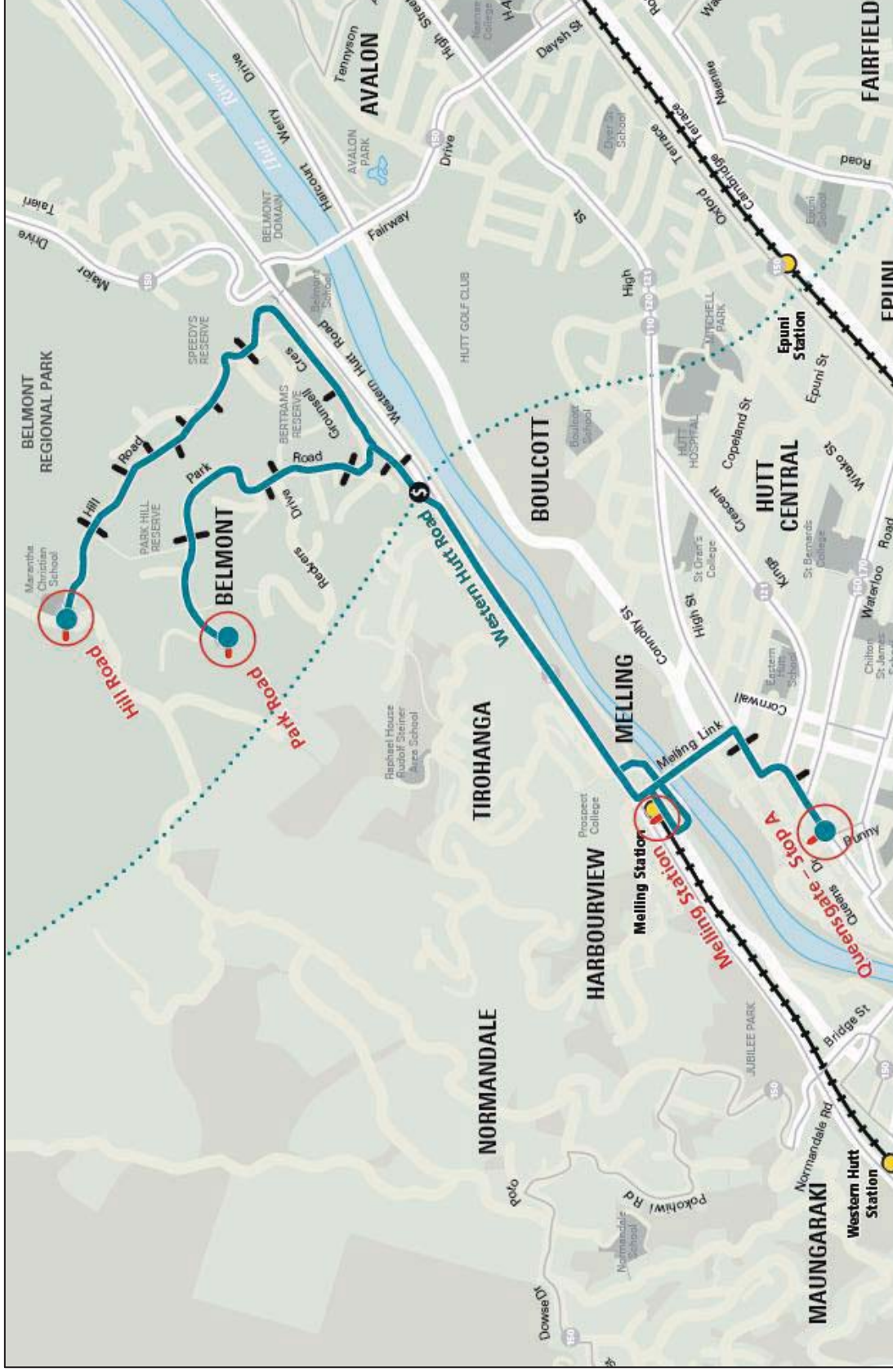


Figure 3: Route 145 Route Map

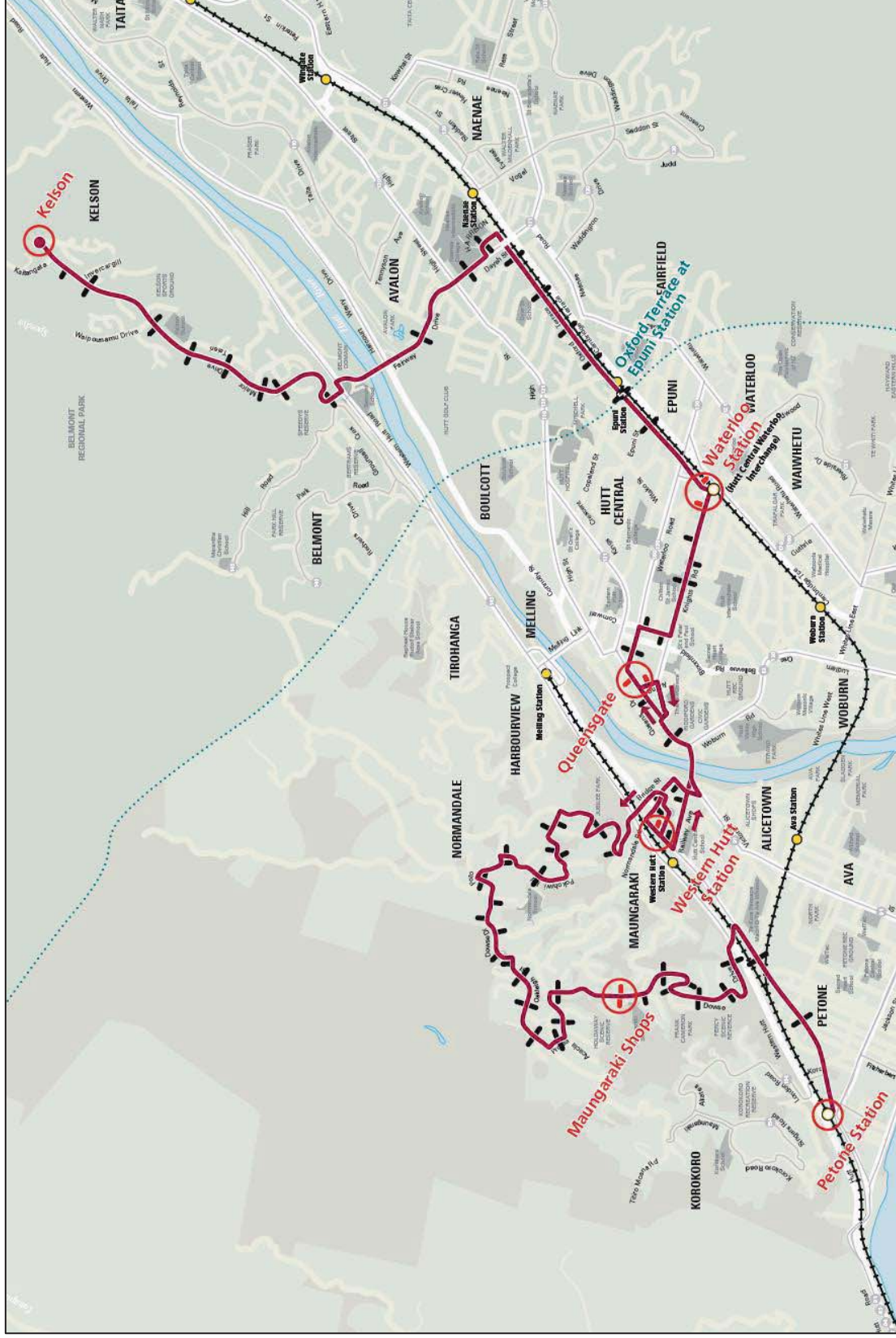


Figure 4: Route 150 Route Map



Figure 5: Route 154 Route Map

	Morning				Afternoon				
Schools	-	-	-	-	15:10	-	-	-	-
Queensgate	-	6:37	7:31	8:15	15:42	16:28	17:12	17:56	18:40
Train arrive	-	6:30	7:29	8:09	15:43	16:21	17:17	17:55	18:25
Melling Station	-	6:43	7:37	8:21	15:48	16:34	17:18	18:02	18:46
Park Road	-	-	-	-	15:54	-	-	-	-
Hill Road	6:12	6:56	7:50	8:34	16:06	16:47	17:31	18:15	18:59
Park Road	6:20	7:04	7:58	8:42	-	16:55	17:39	18:23	-
Melling Station	6:30	7:14	8:08	8:52	16:14	17:05	17:49	18:33	-
Train depart	6:35	7:16	8:14	9:01	16:25	-	18:00	-	-
Queensgate	6:37	7:21	8:15 S	8:59	16:21	17:12	17:56	18:40	-

S - Connects Route 120 school service 11 minutes earlier than present

Table 3: Suggested Route 145 Timetable That Uses One Peak Vehicle

3.2.2 Options

Two options for Route 145 are compared in Table 4.

Option	Advantages	Disadvantages
Status quo.	<ul style="list-style-type: none"> Continues to provide service as at present. 	<ul style="list-style-type: none"> Poor utilisation of resources, as the second peak vehicle is not fully utilised.
Revise the Route 145 timetable to remove the requirement for a second peak vehicle and match service levels to demand.	<ul style="list-style-type: none"> Would retain service that is sufficient to meet demand, including school and train connections Would reduce the peak vehicle requirement by one Would save approximately 17,750 km and 1500 hours per annum. 	<ul style="list-style-type: none"> Some trips would be discontinued and other trip times would change, requiring some passengers to change their journey times.

Table 4: Route 145 Options

3.2.3 Recommendation

- (i) Revise the Route 145 timetable to remove the requirement for the second peak vehicle and match service levels to demand. This is expected to provide cost savings that can be redirected as required, but would be less convenient for passengers.

3.3 Route 154 Services

3.3.1 Issue

Route 154 has been identified as being poorly utilised and has few non-school passengers.

This bus route primarily serves as a school bus service, with children making up 71% of all passengers in March 2014, and the highest patronage levels being aligned with school start and finish times. In the case of the 7:35 trip from Korokoro (which continues beyond Queensgate to a number of schools on school days), the Hutt Valley High School and Hutt Intermediate bus stops account for 90% of the passengers. On that trip, only 24% of boardings are made in the Korokoro area, with another 40% being made at Alicetown Shops, which is also served by other bus routes.

The 14:40 trip to Korokoro is the only trip on this route that operates between 9am and 3pm, when SuperGold card holders can travel for free, however only 20% of its boardings are made by seniors. Insufficient information is available to allow the destination of these trips to be determined, but only 50% of non-senior trips are made to the Korokoro area, which indicates that a large proportion of SuperGold Card-related boardings are likely to be for travel in the Petone, Alicetown and central Lower Hutt areas, which are serviced by a number of other routes.

The 17:15 return trip from Queensgate and the 18:12 trip from Queensgate to Korokoro averaged only 0.1 and 1.0 boardings per trip respectively during March 2014, and at most 3 and 4 boardings per trip, which is very low.

Overall, only half of all Route 154 passengers travel to/from Korokoro, with the remainder of trips being made on the valley floor where they could be catered for by other routes.

3.3.2 Options

Four options for Route 154 are compared in **Error! Reference source not found..**

Option	Advantages	Disadvantages
Status quo.	<ul style="list-style-type: none"> Continues to provide service as at present. 	<ul style="list-style-type: none"> Poor utilisation of resources, given service cost and low patronage levels.
Discontinue the 17:15 return trip from Queensgate and the 18:12 trip from Queensgate to Korokoro	<ul style="list-style-type: none"> Would retain service for 98% of existing passengers Would save approximately 3320 km and 470 hours annually. 	<ul style="list-style-type: none"> The few passengers using these trips would have to find alternative transport options
Discontinue the route and provide a replacement school bus service that serves the same areas (i.e. one return trip per day).	<ul style="list-style-type: none"> Would retain service for the main user group, which comprise 58% of all existing passengers Would save approximately 10,300 km and 1050 hours annually and would only need to run on school days. 	<ul style="list-style-type: none"> Adults would have to find alternative transport options The number of affected individuals is unknown, but approximately four return trips are made by adults or seniors to/from Korokoro per day on this route.
Operate the Korokoro to Petone Station section of the route only.	<ul style="list-style-type: none"> Would allow a lower-cost version of the route to be retained, with connections to destinations. 	<ul style="list-style-type: none"> An additional school bus service is likely to still be required to cater for school journeys and demand.

Table 5: Route 154 Options

3.3.3 Recommendations

- (i) Discontinue the 17:15 return trip from Queensgate and the 18:12 trip from Queensgate to Korokoro. This would retain service for most existing passenger, but would eliminate the two trips that have very low levels of use.
- (ii) Further investigate the options of replacing the route with a school bus service, or changing it to a Korokoro to Petone Station only route, with connections to other destinations.

4. Wainuiomata (Routes 160, 170)

4.1 Introduction

Routes 160 and 170 are local routes that run between Wainuiomata and Queensgate via Waterloo (see Figure 6). The two routes depart at approximately the same time and follow the same path through Lower Hutt, but split at Wainuiomata where:

- Route 160 serves Wainuiomata north; and
- Route 170 serves Wainuiomata south.

The previous stage of this review found both routes perform well through most time periods, but determined that morning peak train connections and capacity, the option of combining low patronage evening services, and the use of the Hutt Hospital extension should be further investigated. These are therefore examined in this section, supported by additional information in Appendix C.

4.2 Morning Peak Train Connections and Capacity

4.2.1 Issue

Routes 160 and 170 provide regular train connections at Waterloo Station, which are designed to facilitate bus-train travel between Wainuiomata and Wellington. Passenger surveys conducted during the previous stage of this review indicated some dissatisfaction with the reliability of these connections. Train connections can also be made for northbound travel from Waterloo, but those connections are not noted in the timetables and have not been assessed in this section.

The current timetable notes the Wainuiomata-Wellington train connections that can be made within the 4-15 minute window that GWRC uses as a guide. These vary, but are generally around six minutes in the peak direction (towards Wellington) in the morning peak. The 7:58 Route 160 trip from Wainuiomata connects to the 8:28 train with a four minute connection window (which requires a 25 minute wait if missed), but is preceded by another bus only eight minutes before this time, so there is limited opportunity to change this trip.

Capacity analysis confirms that the affected services are well-used, but not overloaded, with patronage on all trips being comfortably within vehicle capacity. However, passengers on some morning trips are likely to be required to stand for some distance over Wainuiomata Hill – notably the 7:20, 7:50, 8:51 and particularly the 8:21 Route 160 trips from Wainuiomata – and the maximum peak load on some trips is some 50% higher than the average peak load, which may cause capacity issues on some days.

The peak loading appears to be a function of the train timetable, since the 7:50 trip connects to the last express train to Wellington, and the 8:21 trip connects to the last of the peak trains, with train frequency reducing to the thirty minute off-peak frequency after that time.



Figure 6: Route 160 & 170 route map

4.2.2 Options

There are limited options to change the bus service to address peak loadings, given the link to the train timetable. The main alternatives are to provide a larger bus on some trips or extend the peak period later to spread peak demand.

4.2.3 Recommendation

- (i) Review the train timetable, with a view to potentially extending the peak period frequency by another half hour to spread peak demand.

4.3 Combining Evening Services

4.3.1 Issue

Both Route 160 and Route 170 run into the evening to provide service to all parts of Wainuiomata. However, demand is relatively low and could be met by a single vehicle, rather than the two required at present. Analysis of boarding data indicates that all evening trips could be replaced by a combined route, from the end of the evening peak (around 18:30) to the end of service. A combined route could also potentially replace all weekend trips, although this may lead to high loadings on some trips, requiring additional capacity at those times.

A combined evening route would follow the standard path between Queensgate and the Wainuiomata Road-Parkway intersection in Wainuiomata, and a variation that combines the path of both routes within Wainuiomata.

If the routes are combined it should be possible to maintain a connection with every train during the evening and weekend periods (every second train Sundays), and provide a 'guaranteed' train connection for all outbound trips, particularly with late night trips, at no additional cost.

4.3.2 Options

Two options for Wainuiomata evening services are compared in Table 6.

Option	Advantages	Disadvantages
Status quo	<ul style="list-style-type: none"> Simple for passengers to understand, as the same routes run throughout the day and weekend. 	<ul style="list-style-type: none"> Running two vehicles at similar times with significant spare capacity when demand is lower represents poor utilisation of resources.
Combine both routes during evening (and potentially weekend)	<ul style="list-style-type: none"> Would enable a 'guaranteed' connection to be for all outbound trips (i.e. the bus can wait for the train for up to 20 minutes) Would increase the loading per trip and reduce vehicle kilometres travelled. 	<ul style="list-style-type: none"> Not as simple as the status quo as the bus would take a different route at different times of the day Some passengers would have a longer bus trip to reach their destination as the bus would have to loop through both the north and

Option	Advantages	Disadvantages
		south of Wainuiomata <ul style="list-style-type: none"> Two vehicles would still be required due to the travel time of the combined route, and there would therefore be no reduction in vehicle operating hours.

Table 6: Wainuiomata Evening Service Options

Three options have been identified for a combined route, and are shown in Figure 7 and compared in Table 7. There are a number of other variations to these options that could also be considered if the option of combining evening services is selected.

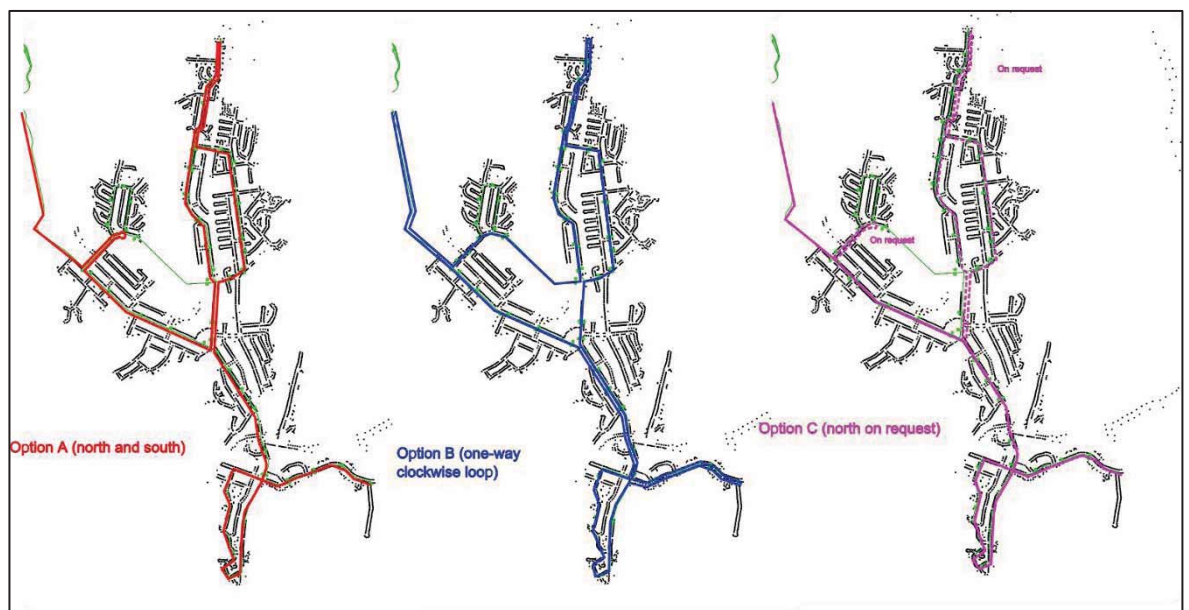


Figure 7: Combined Route 160/170 Route Options in Wainuiomata

Option	Advantages	Disadvantages
Option A (north and south)	<ul style="list-style-type: none"> Maintains existing coverage and aligns closely with regular Route 160 and 170 routes Allows the bus to layover at end of the route, so that the return trip can connect with train Easy to understand. 	<ul style="list-style-type: none"> Requires the bus to turn at the Mohaka Street roundabout, or operate around the Parkway loop Results in a long travel time for passengers travelling to Wainuiomata south.
Option B (one-way clockwise loop)	<ul style="list-style-type: none"> The bus does not need to turn The route is relatively easy to understand 	<ul style="list-style-type: none"> Bus stops on one side of the road are not serviced, which may be confusing for passengers There is no opportunity for the bus to layover, to connect the inbound trip with the train Results in a long travel time

Option	Advantages	Disadvantages
Option C (north on request)	<ul style="list-style-type: none"> Provides a more direct service for passengers travelling to Wainuiomata south when there are no passengers to Wainuiomata north Allows the bus to layover at end of the route, so that the return trip can connect with the train. 	<p>for passengers travelling to Wainuiomata south.</p> <ul style="list-style-type: none"> Not as easy to understand as the other options Passengers from Wainuiomata north would have no inbound bus service.

Table 7: Comparison of Wainuiomata Evening Route Options

Option A is recommended, because it closely matches the existing operating pattern and allows layover time for the bus to connect inbound trips with the train. Options B and C are not recommended, because the former would not provide reliable train connections for inbound services and the latter would not provide inbound services for Wainuiomata north passengers. The costs of operating each of the three options are approximately the same.

4.3.3 Recommendation

- (i) Consider operating a combined Wainuiomata bus route during evening and weekend periods. This is expected to provide minor cost savings, while also enabling 'guaranteed' train connections for Wainuiomata bus services, but the resulting variation in services by time of day and week is likely to be more difficult for passengers to understand.

4.4 Hutt Hospital Services

4.4.1 Issue

In the morning, the 7:20 and 7:50 Route 160 trips and the 7:18 and 7:38 Route 170 trips from Wainuiomata continue beyond Queensgate to Hutt Hospital. In the afternoon, a return pair of Route 160 trips commence at Hutt Hospital, departing there at 16:57 and 17:17, and providing a connection to Route 170 at Queensgate. The Queensgate-Hutt Hospital section of these trips has been identified as being underutilised.

During March 2014, approximately 2.7 passengers per trip used Route 160 and 1.6 passengers per trip used Route 170 to travel north of Queensgate in the morning. Approximately 29% of Route 160 and 22% of Route 170 passengers travelled to Hutt Hospital, with 31% and 50% travelling to the Ropata Medical Centre bus stop (near St Oran's College) respectively, and 23% and 21% travelling to High Street at Melling Road bus stop respectively. Three quarters of Route 160 passengers used the 7:20 trip, although only one third of Hutt Hospital-bound passengers used that trip, with the majority favouring the later trip. Two thirds of Route 170 passengers used the 7:38 trip, including the majority of Hutt Hospital-bound passengers.

In the same month, boardings across the six bus stops north of Queensgate served by the two afternoon trips averaged 1.5 boardings per trip. Approximately 43% of those boardings

were made at Hutt Hospital, with the balance evenly spread over the other bus stops between there and Queensgate. Three quarters of passengers used the 16:57 trip.

4.4.2 Options

Three options for Hutt Hospital services are compared in Table 8.

Option	Advantages	Disadvantages
Status quo.	<ul style="list-style-type: none"> Provides an option for passengers from Wainuiomata and the south-eastern Lower Hutt suburbs that wish to travel a short distance beyond the Lower Hutt CBD without connecting to another service. 	<ul style="list-style-type: none"> Poor utilisation of resources given service cost and low patronage levels (although the cost of providing these trips is relatively low).
Discontinue the Queensgate-Hutt Hospital section of the 7:50 and 17:17 Route 160 trips and the 7:18 Route 170 trip. Retain the two most used morning trips– the 7:20 Route 160 and 7:38 Route 170 trips to Hutt Hospital – and the most used afternoon trip – the 16:57 trip from Hutt Hospital.	<ul style="list-style-type: none"> Would save approximately 1900 km per annum (there is no corresponding saving in hours since the vehicles that run to Hutt Hospital would otherwise lay over) 	<ul style="list-style-type: none"> Less convenient for passengers who currently use the Queensgate-Hutt Hospital section of the 7:50 and 17:17 Route 160 trips and the 7:18 Route 170 trip, who would have to change their travel to one of the remaining trips or connect to another service at Queensgate.
Discontinue Queensgate-Hutt Hospital section of all Route 160 trips.	<ul style="list-style-type: none"> Would save approximately 3800 km per annum (there is no corresponding saving in hours since the vehicles that run to Hutt Hospital would otherwise lay over) Would eliminate a route variation, making the timetable easier to understand. 	<ul style="list-style-type: none"> Less convenient for passengers that currently use the Queensgate-Hutt Hospital section of these trips, who would have to connect to another service at Queensgate.

Table 8: Route 160 Hutt Hospital Service Options

4.4.3 Recommendations

- (i) Discontinue the Queensgate-Hutt Hospital section of the 7:50 and 17:17 Route 160 trips and the 7:18 Route 170 trip. Retain the two most used morning trips – the 7:20 Route 160 and 7:38 Route 170 trips to Hutt Hospital – and the most used afternoon trip – the 16:57 trip from Hutt Hospital.
- (ii) This is expected to provide cost savings, while retaining a link for passengers wanting to travel a short distance beyond the Lower Hutt CBD without connecting to another service. The majority of Route 160 and 170 passengers that travel north of Queensgate would be unaffected, since most use the 7:20, 7:38 and 16:57 trips that would be retained.

5. Stokes Valley (Routes 120, 121)

5.1 Introduction

Routes 120 and 121 link Stokes Valley with other parts of the Hutt Valley. The routes have different catchments and functions:

- Route 120 is a core route that runs between Stokes Valley and Queensgate, via Taita (High Street) and Hutt Hospital (see Figure 8), and provides high levels of service along a key corridor; and
- Route 121 is a local route that runs between Valley Heights and Gracefield, via Taita (Eastern Hutt Road), Naenae, Hutt Hospital, Queensgate and Waterloo (see Figure 9), at relatively low frequencies on weekdays only.

The previous stage of this review found that both routes perform well through most weekday periods, but determined that Route 120 capacity and train connections, and the option of switching Routes 110 and 120 south of Queensgate should be further investigated. These are therefore examined in this section, supported by additional information in Appendix D.

5.2 Route 120 Capacity

Capacity analysis confirms that the affected services are well-used but not overloaded, with patronage on all weekday trips being comfortably within vehicle capacity. No further action is recommended.

5.3 Route 120 Train Connections

5.3.1 Issue

Route 120 provides regular train connections at Taita Station, which are designed to facilitate bus-train travel between Stokes Valley and Wellington. Passenger surveys conducted during the previous stage of this review indicated some dissatisfaction with the reliability of these connections. Train connections can also be made for bus-train travel between Stokes Valley and Upper Hutt, and Upper Hutt and Hutt Hospital/Queensgate, but those connections are not noted in the timetables and have not been assessed in this section.

The Route 120 timetable was revised in 2009, when the southern terminus of the route was cut back to Queensgate from Petone. Bus-train connections were checked and adjusted as required when rail timetables were changed in 2011.

The current timetable notes the Stokes Valley-Wellington connections that can be made within the 4-15 minute window that GWRC uses as a guide. These vary considerably, but are typically seven minutes in the southbound direction (towards Wellington) and five minutes in the northbound direction (towards Taita and Stokes Valley via the connecting bus).



Figure 8: Route 120 Route Map

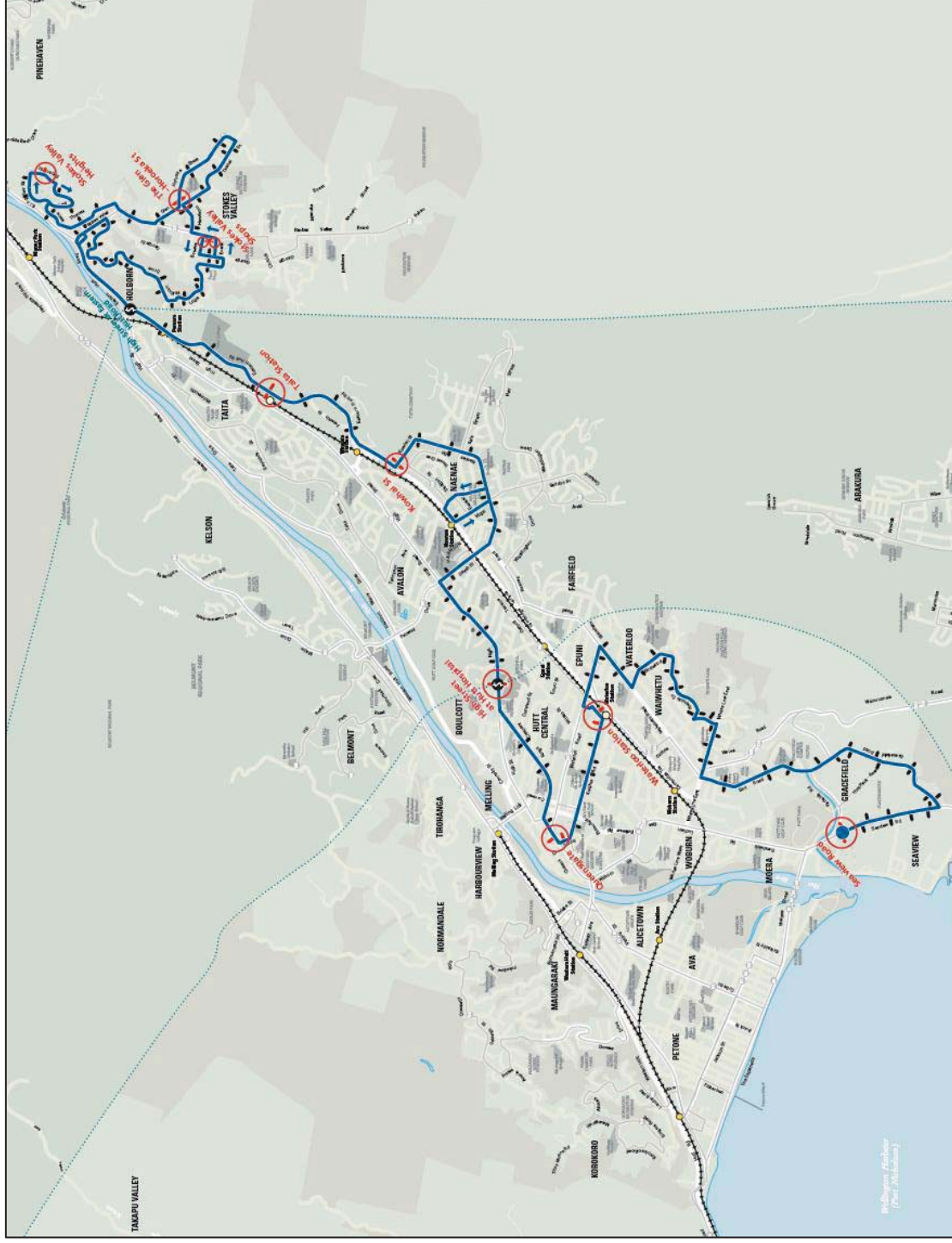


Figure 9: Route 121 Route Map

Train performance at meeting the scheduled arrival/departure times at Taita is unavailable, but analysis of Real Time Information System data for Route 120 from March 2014 provides some indication of the bus performance against these connections, as shown in Table 9.

Train connections for weekday Route 120 trips departing Stokes Valley southbound	Train connections for weekday Route 120 trips departing Queensgate northbound
<ul style="list-style-type: none"> The 7:55 trip runs 3.40 minutes late on average, but has a timetabled nine minute connection time at Taita, so the connection remains sufficient at 5.60 minutes All other southbound trips arrive at Taita within three minutes of their scheduled time, which is sufficient for connections to be viable² if the connecting trains are running to timetable. 	<ul style="list-style-type: none"> The 15:20 trip runs 2.40 minutes early on average, but is timetabled to arrive at Taita six minutes after the train, so the connection is less than the four minute threshold and marginal at 3.60 minutes The 15:38 trip³ runs 2.76 minutes early on average, but is timetabled to arrive at Taita fourteen minutes after the train, so the connection remains sufficient at 11.24 minutes The 23:25 trip runs 1.14 minutes early on average, but is timetabled to arrive at Taita five minutes after the train, so the connection is less than the four minute threshold and marginal at 3.86 minutes All other northbound trips arrive at Taita less than one minute early, which is sufficient for connections from train to bus to be viable if the connecting trains are running to timetable Five northbound trips that have train connections run between three and five minutes late on average – the 8:55, 11:25, 12:25, 13:25 and 13:55 trips – which significantly adds to connection times, although these remain within the 15 minute threshold.

Table 9: Performance of Route 120 Train Connections

The performance of Route 120 at meeting bus-train connections at Taita is therefore generally within acceptable limits, but warrants some further investigation.

5.3.2 Recommendations

- (i) Investigate train performance at meeting scheduled arrival/departure times at Taita⁴ to determine whether these are being delivered to an acceptable standard and allow connections to take place as planned. Particular focus on the performance of northbound train services from Wellington will be required, where the success of bus connections is likely to be heavily influenced by the reliability of rail services at meeting scheduled arrival times at Taita.
- (ii) Assess the causes of early-running Route 120 trips, and address these to ensure that no services depart Taita more than one minute ahead of their scheduled time.

² Based on the 4-15 minute connection window that Greater Wellington uses as a guide.

³ This service commences at Sacred Heart College at 15:30 and departs Queensgate at 15:38.

⁴ And other key Hutt Valley stations where planned bus train connections are made - Upper Hutt, Trentham, Silverstream, Waterloo and Petone Stations.

Particular focus should go on the trips identified above, the 15:20, 15:38³ and 23:25 northbound trips from Queensgate. Assess the causes of late-running Route 120 trips, particularly those noted in Table 9, and reduce these as much as possible to minimise connection times.

- (iii) Finally, it is noted that some train times in the current Route 120 timetable do not match those in the current train timetable⁵. Given the role that the bus timetables have in showing the availability and duration of bus-train connections, it is recommended that train times be checked across all timetables to ensure that they are aligned.

5.4 Switching Routes 110 and 120 South of Queensgate

5.4.1 Issue

The southern terminus of Route 120 is currently located at Queensgate. Between 2003, when the route was introduced, and 2009 when the route was shortened to reduce the overlap with Routes 83, 91 and 110 and match service levels to demand south of Queensgate, it was located at Petone Station. As a consequence of that change, most Stokes Valley passengers and some Taita and Avalon passengers were required to connect to another service at Queensgate to travel between those points and locations south of there.

GWRC has received some feedback from Stokes Valley residents, suggesting that a better arrangement would be to switch Route 110 and 120 south of Queensgate, so that Route 110 terminates at that location and Route 120 continues to Petone. It has also been suggested that this alternative might provide a solution to the reliability issues that Route 110 has been experiencing (see Section 6.2).

5.4.2 Options

The two options are compared in Table 10.

⁵ Specific examples that we have noted are the southbound trains that the train timetable specifies as departing Taita at 16:19 and 16:38, which the bus timetable specifies as departing one minute later at 16:20 and 16:39 respectively.

Option	Advantages	Disadvantages
Status quo (Route 110 runs to Petone and Route 120 terminates at Queensgate)	<ul style="list-style-type: none"> The higher-patronage route (110) that serves a greater range of origins and destinations north of Queensgate – including Stokes Valley entrance and large sections of Taita and Avalon – is the route that continues south of there to allow a greater number of journeys to take place without a connection Established routes and travel patterns are maintained. 	<ul style="list-style-type: none"> Some Stokes Valley, Taita and Avalon passengers must continue to connect to another service to travel between there and locations south of Queensgate Route 110 reliability issues must be addressed separately.
Switch Routes 110 and 120 south of Queensgate, so that the 110 terminates at that location and the 120 continues to Petone.	<ul style="list-style-type: none"> Some Stokes Valley, Taita and Avalon passengers would gain connection-free travel between there and locations south of Queensgate Major timetable changes would provide an opportunity to reconfigure Route 110 timetables in a way that potentially does not require an additional peak vehicle. 	<ul style="list-style-type: none"> All Upper Hutt⁶ and some Taita and Avalon passengers that are currently able to travel between those points and destinations south of Queensgate without a connection would be required to connect to another service Approximately 21% of all Route 110 passengers – equating to 5% of all Hutt Valley bus passengers – currently make such journeys, can't use Route 120 as an alternative, and would be adversely affected The number of passengers that would benefit from switching the routes is unclear, but is likely to be lower than the number adversely affected, since the number of Route 120 passengers travelling to/from Queensgate (the key connection point) is lower than the number of Route 110 passengers travelling between points not served by Route 120 and points south of Queensgate Would require major timetable changes to both routes to implement.

Table 10: Route 110 and 120 Switching Options

⁶ Includes multiple Upper Hutt suburbs that are served by Route 110, from Emerald Hill to Silverstream.

5.4.3 Recommendation

- (i) Retain existing Route 110 and 120 routes, with Route 110 running through to Petone Station and Route 120 terminating at Queensgate. This benefits a greater number of passengers and origin/destination points than the alternative option and does not require major changes to timetables.

6. Upper Hutt (Route 110)

6.1 Introduction

Route 110 is a core route that runs between Emerald Hill and Petone via Upper Hutt, Silverstream, Stokes Valley (entrance), Hutt Hospital and Queensgate. It provides high levels of service along a key corridor.

There are several variations to this route (see map in Figure 10):

- the standard 110 route, which runs between both termini, at all time periods, seven days a week;
- a shortened version of the standard route, which runs south of Upper Hutt station in the weekday morning peak and inter-peak periods only;
- a 2.2 km deviation of the standard route, which serves the Gillespies Road area in peak periods only; and
- a 6.4 km local route variant, which runs between the Gillespies Road area and Upper Hutt station in the weekday morning peak and inter-peak, and Saturday periods only.

The previous stage of this review found that Route 110 services are generally well utilised, but determined that reliability issues in some time periods and use of the Gillespies Road section of the route should be further investigated. These are therefore examined in this section, supported by additional information in Appendix E.

6.2 Route 110 Reliability

6.2.1 Issue

Route 110 services are generally well utilised, but are subject to reliability issues in some time periods, which affects user satisfaction.

The standard 110 route is timetabled to run the southbound 30.7 km in 68 minutes, and the northbound 30.6 km in 67 minutes. An additional 5 minutes is allowed for southbound services that divert via the Gillespies Road area, and an extra 2 minutes for northbound services. The shortened version of the routes is timetabled to run the southbound 24.3 km in 53 minutes, and the northbound 24.0 km in 52 minutes.

Analysis of Real Time Information System data from March 2014 reveals that the above running times generally appear to be adequate in most time periods, but are inadequate in the weekday morning peak, early and late inter-peak, and afternoon peak periods, when most trips take longer than timetabled to complete. The resulting delays often compound, because most trips do not have sufficient layover time built into the timetable in these time periods.

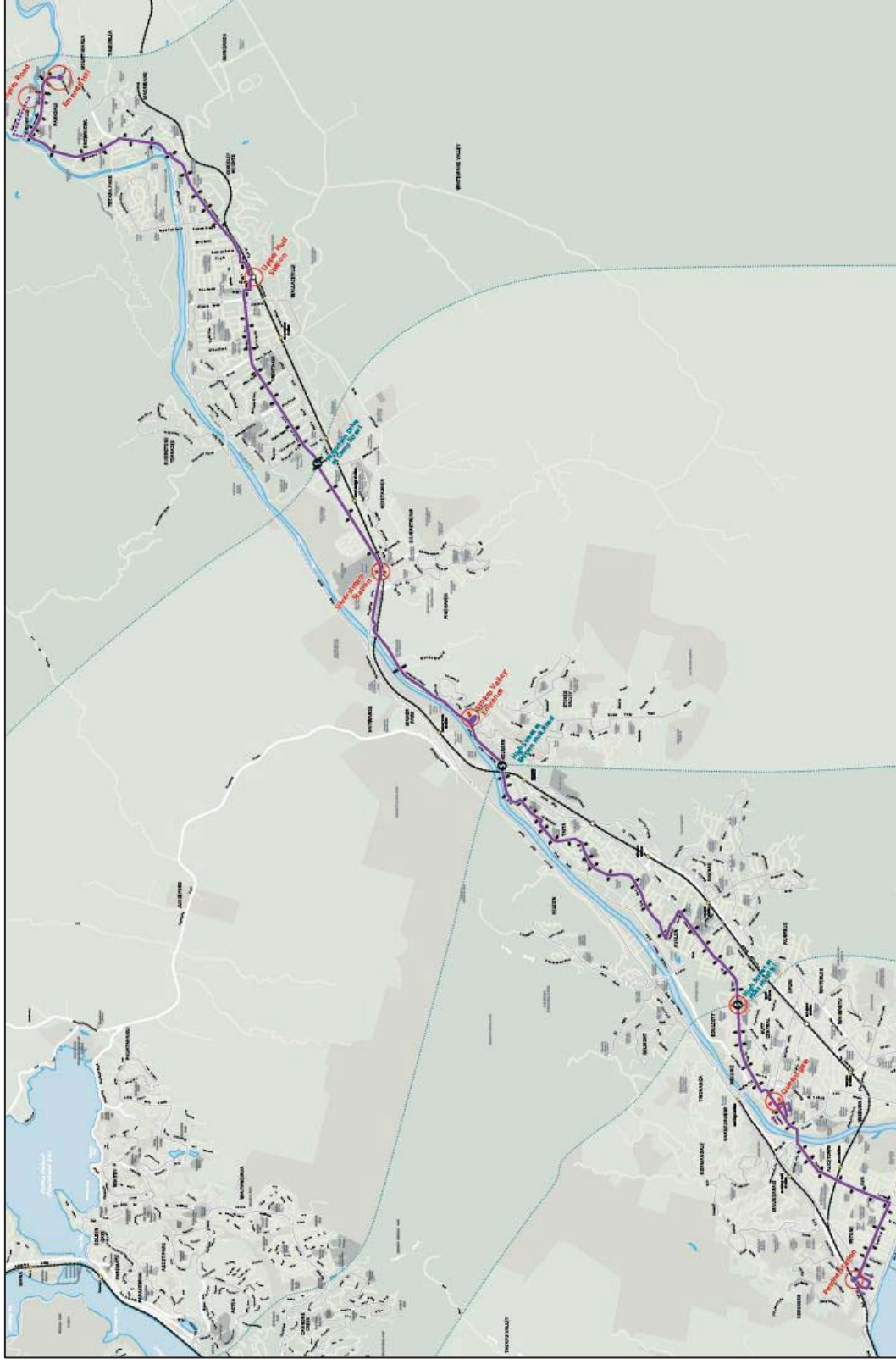


Figure 10: Route 110 Route Map

Table 11 notes the trips that are most affected and the key issues that affect their reliability.

	Trips Departing Emerald Hill/Upper Hutt Southbound	Trips Departing Petone Northbound
Morning peak and early inter-peak	<ul style="list-style-type: none"> Between 7:05 and 9:10 require an extra 5-10 minutes south of Silverstream (although departures up to 10:40 also ideally require an extra 2-3 minutes). 	<ul style="list-style-type: none"> Between 8:18 and 10:03 depart late due to the late arrival of the preceding southbound trip and lack of a layover, and carry the resulting delay for much of their trip, but have adequate running times.
Late inter-peak and afternoon peak	<ul style="list-style-type: none"> At 14:40 require an extra 5-10 minutes south of Silverstream At 15:10 require an extra 5 minutes south of Silverstream At 15:42, 15:55 and 16:10 depart late due to the late arrival of the preceding northbound trip (the 14:33, 14:48 and 15:03 trips from Petone) and lack of a layover, and carry the resulting delay for much of their trip, but have adequate running times At 16:25 depart late due to the scheduled late arrival of the preceding northbound trip (the 15:18 trip from Petone that is not actually scheduled to arrive at Emerald Hill until 16:30), but have adequate running times At 16:40 depart late due to the late arrival of the preceding northbound trip (the 15:33 trip from Petone) and lack of a layover, and carry the resulting delay throughout the trip, but have adequate running times. 	<ul style="list-style-type: none"> At 14:33, 14:48 and 15:03 require an extra 5-10 minutes north of Silverstream At 15:33 and 15:48 depart late due to the late arrival of the preceding southbound trip (the 14:40 trips from Emerald Hill and Upper Hutt) and require an extra 5 minutes north of Lower Hutt At 16:18 and 16:50 depart late due to the late arrival of the preceding southbound trip (the 15:10 and 15:42 trips from Emerald Hill) and lack of a layover and require an extra 5-10 minutes north of Petone.

Table 11: Route 110 Trips with Particular Reliability Issues

Capacity analysis confirms that the affected services are well-used but not overloaded, with patronage on all weekday trips being comfortably within vehicle capacity, although some trips that run around school times are approaching capacity limits. The reliability issues therefore appear to relate to unrealistic running times and a lack of timetable recovery time during the peaks, when boardings are highest and traffic congestion is at its worst.

Particular note should be made of the two trips that have the highest average maximum Route 110 loadings, being the trips that depart Petone at 14:33 and 14:48, and which are also the two afternoon and two northbound trips with the highest average maximum loadings. These arrive in Upper Hutt just after the end of the school day and reach their maximum loading point at the bus stop located at Trentham School, which provides Route 110 access for several schools located in the area. The resulting passenger loads cause delay to these services, which in turn affects the return trips made by the same vehicles southbound as the 15:42 and 15:55 trips from Emerald Hill, and in turn, the northbound 16:50 trip from Petone.

Particular note should also be made of the two morning trips with the highest average maximum loadings, being the 7:22 and 7:55 trips from Emerald Hill, which are also the two trips with the highest average maximum loadings in the southbound direction. These trips have the greatest delay in the morning, and this delay also affects the subsequent return trips made by the same vehicles northbound as the 8:33 and 9:03 trips from Petone.

6.2.2 Options

Six options for improving Route 110 reliability are compared in Table 12.

Option	Advantages	Disadvantages
Status quo.	<ul style="list-style-type: none"> No additional cost. 	<ul style="list-style-type: none"> Most weekday morning peak, early and late inter-peak, and afternoon peak trips are likely to continue to experience late running, affecting connections with other bus and train services and general user satisfaction.
Revise weekday morning peak, early and late inter-peak, and afternoon peak running times to match actual running times, within existing contract cost.	<ul style="list-style-type: none"> Would improve timetable reliability. 	<ul style="list-style-type: none"> Would require some cuts to frequency to reflect actual running times Some trips may therefore run at capacity, which may lead to some buses skipping bus stops when full Would be expected to reduce overall user satisfaction and possibly patronage.
Revise weekday morning peak, early and late inter-peak, and afternoon peak running times to match actual running times, within existing timetable.	<ul style="list-style-type: none"> Would improve reliability and maintain the existing timetable. 	<ul style="list-style-type: none"> Would require an additional peak vehicle and timetabled layover time, with associated cost.
Supplement some trips with a banker vehicle.	<ul style="list-style-type: none"> May reduce the need to change some running times by spreading localised demand 	<ul style="list-style-type: none"> May only be an appropriate option for the 14:33 and 14:48 northbound trips, whose delay results from localised school loadings Would require additional vehicle km and time, with associated cost. Could also be used to assist with 7:22 southbound trip, but would likely require an additional peak vehicle, as well as additional vehicle km and time.
Provide additional school bus services.	<ul style="list-style-type: none"> May reduce the need to change some running times by spreading localised demand 	<ul style="list-style-type: none"> May only be an appropriate option for the 14:33 and 14:48 northbound trips, whose delay results from localised school loadings Would require additional

Option	Advantages	Disadvantages
Switch Routes 110 and 120 south of Queensgate, so that the 110 terminates at that location and the 120 continues to Petone.	<ul style="list-style-type: none"> See Section 5.4. 	<ul style="list-style-type: none"> vehicle km and time, with associated cost. See Section 5.4.

Table 12: Route 110 Reliability Options

6.2.3 Recommendations

- (i) Revise weekday morning peak, early and late inter-peak, and afternoon peak running times to match actual running times, within the existing timetable. This is expected to improve reliability and therefore customer satisfaction, while maintaining service levels on this important core route. However, this option is expected to require an additional peak vehicle and timetabled layover time with associated cost.
- (ii) Investigate the option of supplementing the 14:33 and 14:48 northbound trips from Petone in Upper Hutt, either through the use of a banker vehicle that runs only on school days, or through the provision of additional school bus services. Both options are expected to reduce the need to change the running times of these services by spreading localised demand, although both options are expected to require additional vehicle km and time with associated cost.

6.3 Gillespies Road Services

6.3.1 Issue

The Gillespies Road section of Route 110 north of the Hutt River in Birchville has been identified as being underutilised. Additionally, three different route variations run in the immediate vicinity, which is complex to operate and difficult for passengers to understand.

The Birchville area is served by the following services:

- the standard 110 route, which runs on the south side of the Hutt River via Gemstone Drive and Akatarawa Road (shown as the solid line in Figure 11);
- a 2.2 km deviation of the standard route, which is used by four weekday southbound (towards Petone) morning peak and five weekday northbound afternoon peak trips that divert north of the Hutt River via Akatarawa Road and Gillespies Road on their way from/to the Emerald Hill terminus (shown as a dashed line in Figure 11); and
- a 6.4 km local route variant that operates independently of the standard route, which is used by one return weekday morning peak, two return weekday inter-peak and four return Saturday trips that operate between a terminus at the corner of Gillespies Road and Edmund Lomas Grove and Upper Hutt Station (shown as a dashed line in Figure 11).

North of the Hutt River, the diverted and local services serve a pair of bus stops on Akatarawa Road, three pairs of bus stops on Gillespies Road, and the bus stop at the Gillespies Road and Edmund Lomas Grove turning point/terminus. These bus stops provide 500 metre access to a regular bus service to 194 households, 40 of which are located within

500 metres of the standard 110 route. Around 40% of diverted and local service boardings are made at the two pairs of bus stops that are closest to the standard 110 route.

During March 2014, boardings across the bus stops served by diverted and local services north of the Hutt River averaged 0.9 southbound boardings per trip. This compares to an average of 2.1 southbound boardings per trip across the five nearest bus stops south of the Hutt River during that month.

Local services were particularly under-used by passengers, carrying only 13% of all boardings and alightings made north of the Hutt River during the month. One return weekday inter-peak service did not carry any passengers in either direction north of the Hutt River during that month.

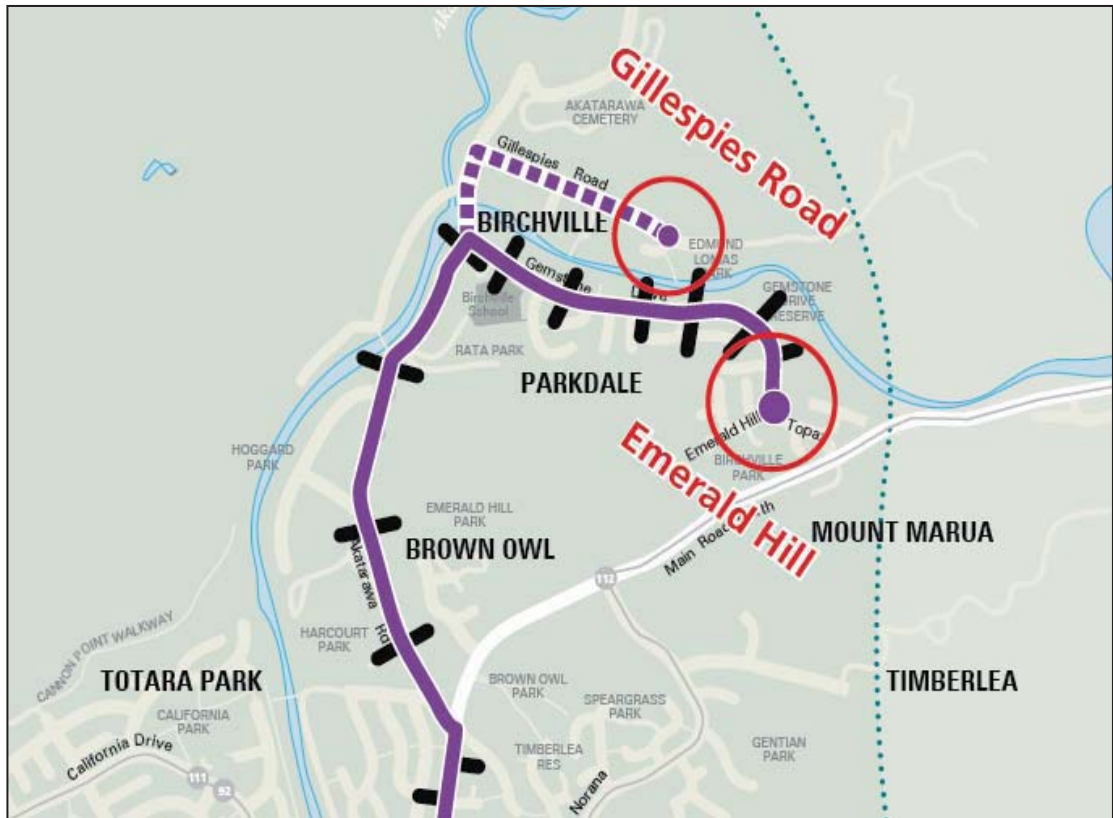


Figure 11: Route 110 in the Birchville Area

6.3.2 Options

Three options for the Gillespies Road section of Route 110 are compared in Table 13.

Option	Advantages	Disadvantages
Status quo.	<ul style="list-style-type: none"> 154 households continue to have 500 metre access to a regular bus service. 	<ul style="list-style-type: none"> Poor utilisation of resources, given service cost and low patronage levels.
Discontinue all Route 110 diverted and local service north of the Hutt River, other than two weekday local inter-peak return trips. Retain school bus services to the affected area.	<ul style="list-style-type: none"> Would save approximately 11,000 km and 230 hours per annum May provide additional savings if a peak vehicle can be saved May improve peak reliability 	<ul style="list-style-type: none"> Cost per boarding is more than double the current level Patronage is likely to be low, given current low off-peak patronage levels 154 households would lose

	<p>on the standard 110 route by removing the deviation</p> <ul style="list-style-type: none"> • Would preserve a basic accessibility service and school bus service to the 154 households that would otherwise lose 500 metre access to a regular bus service. 	<p>500 metre access to peak and weekend services – those residents and some residents of Bridge Street and Akatarawa Road that are currently outside the 500 metre access boundary would need to walk up to 1km further to catch peak and weekend services, although 40% of existing passengers would not need to walk further than 750 metres (nine minutes).</p>
<p>Discontinue all Route 110 diverted and local service north of the Hutt River. Retain school bus services to the affected area.</p>	<ul style="list-style-type: none"> • Would save approximately 17,000 km and 390 hours per annum • May provide additional savings if a peak vehicle can be saved • May improve peak reliability on the standard 110 route by removing the deviation • Would provide a consistent timetable across all Route 110 services, which would be easier to understand • Would preserve school bus service to the 154 households that would lose 500 metre access to a regular bus service. 	<ul style="list-style-type: none"> • 154 households would lose 500 metre access to a regular bus service – those residents and some residents of Bridge Street and Akatarawa Road that are currently outside the 500 metre access boundary would need to walk up to 1km further to catch services, although 40% of existing passengers would not need to walk further than 750 metres (nine minutes).

Table 13: Gillespies Road Area Options

6.3.3 Recommendation

- (i) Retain all standard Route 110 services, but discontinue all diverted and local service north of the Hutt River in Birchville (i.e. retain all standard Route 110 services, but do not divert any north of the Hutt River, and discontinue all local Route 110 services). Retain school bus services to the affected area to ensure that access to education is maintained.

This is expected to provide cost savings, and improve route legibility and potentially reliability, which would benefit all users of this core route. However, 154 households that currently have 500 metre access to a regular bus service in the Gillespies Road, Akatarawa Road and Bridge Street area would lose it, and residents of this area would need to walk up to 1km further to catch non-school services. Approximately 40% of existing passengers would not need to walk further than 750 metres (nine minutes).

7. Upper Hutt Local (Routes 111, 112, 114, 115)

7.1 Introduction

Routes 111, 112, 114 and 115 link Upper Hutt suburbs that are located some distance from the public transport spine (which is defined by the railway line and Route 110) with the Upper Hutt CBD and key railway stations where passengers can connect to other services. These local routes have different catchments:

- Route 111 runs between Totara Park and Upper Hutt Station (see Figure 12), on relatively low frequencies, Monday-Saturday;
- Route 112 runs between Te Marua and Upper Hutt Station, via Timberlea and Maoribank (see Figure 12), on relatively low frequencies, Monday-Saturday;
- Route 114 runs between Trentham Station and Upper Hutt Station, via Poets Block (see Figure 13), on relatively low frequencies on weekdays; and
- Route 115 runs between Pinehaven and Upper Hutt Station, via Silverstream Heretaunga, Trentham and Wallaceville (see Figure 14), on relatively low frequencies on weekdays.

The previous stage of this review found that the Upper Hutt local routes generally fall within utilisation guidelines in spite of relatively low patronage levels, but should be further investigated along with options for improving services to the Riverstone Terraces area. These are therefore examined in this section, supported by additional information in Appendix F.

7.2 Riverstone Terraces Services

7.2.1 Issue

Riverstone Terraces is relatively new suburb of Upper Hutt, which is located on the northern side of the Hutt River near the State Highway 2 crossing of the Hutt River. The suburb has been progressively developed over the last decade, and as of the 2013 census, had a resident population of 1383 at 474 addresses⁷.

Riverstone Terraces is currently served by a twice-daily hail and ride diversion of the Route 114 (the dashed line in Figure 15), which was introduced in October 2012. This operates on school days only, with the 8:00 northbound trip from Trentham Station departing Kirton Drive at 8:12 and the 15:15 southbound trip from Upper Hutt Station⁸ returning at 3:36. It is used primarily by children to travel to school, although adults can also use the service, but is not well-patronised⁹.

⁷ This had increased to 496 addresses in late-2014, when TDG surveyed residents for this review.

⁸ This service starts its journey at St Joseph's School at 15:05.

⁹ Due to the hail & ride nature of this service, all boardings and alightings are recorded at the first bus stop following Riverstone Terraces on the south side of the Hutt River (located at 25 Shakespeare Avenue), which makes it difficult to determine the actual level of Riverstone Terraces use. However, an average of less than one passenger boarded the morning service at that bus stop during March 2014 (almost all children), which indicates a low level of Riverstone Terraces use. Three people were observed boarding the morning service on a Tuesday in October 2014.

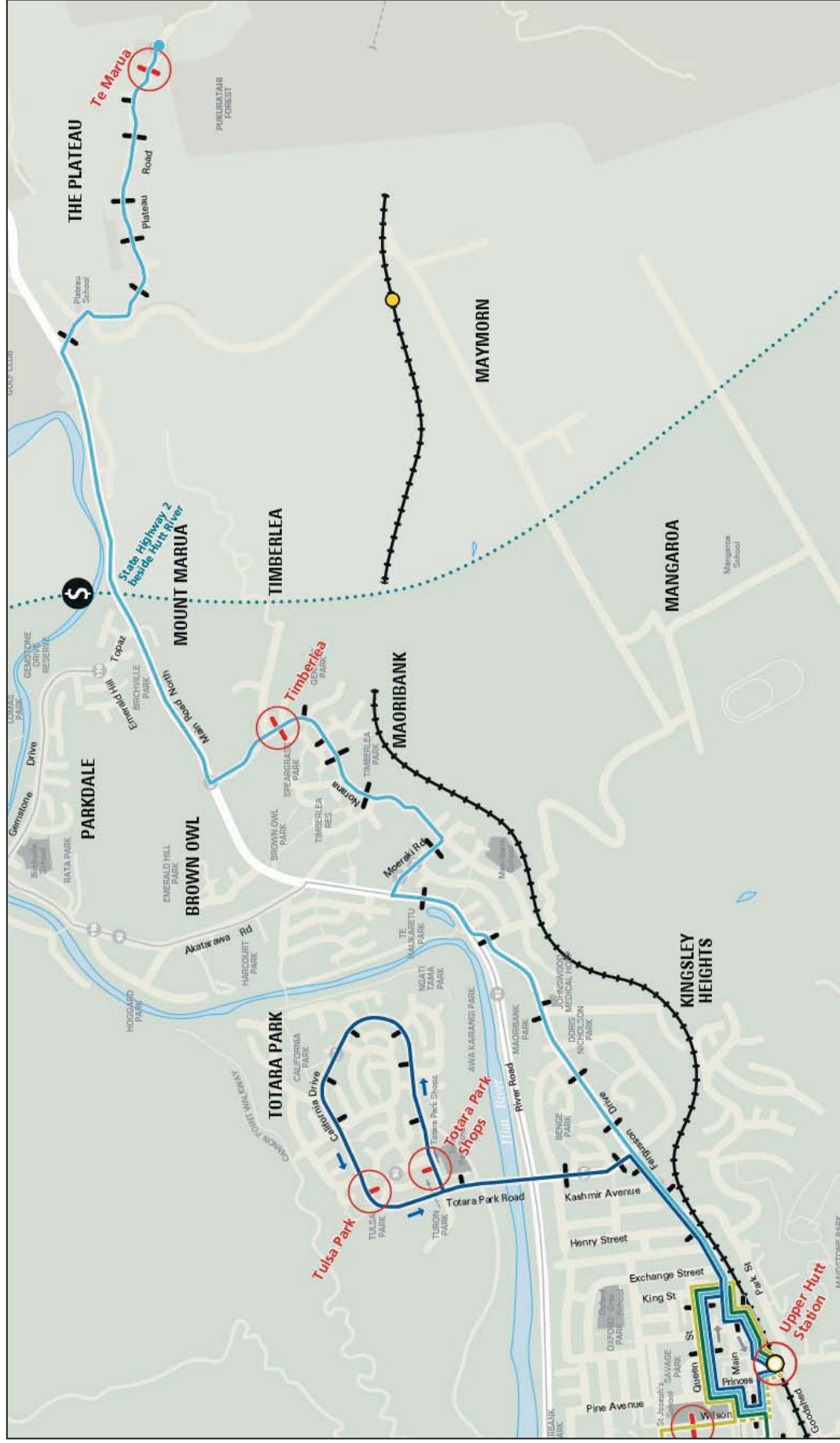


Figure 12: Route 111 (dark blue) & 112 (light blue) Route Map



Figure 13: Route 114 (light green) Route Map

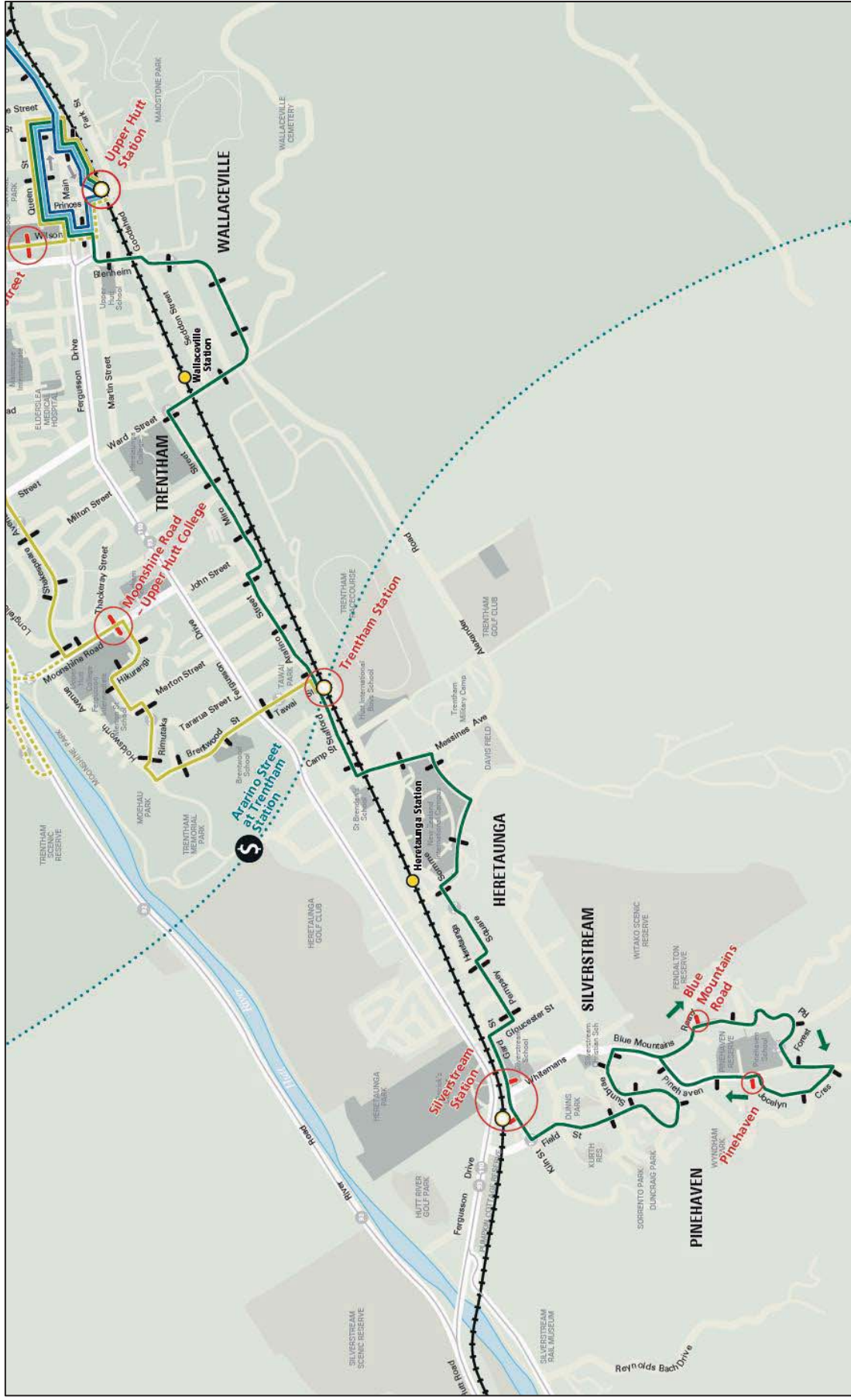


Figure 14: Route 115 (dark green) Route Map



Figure 15: Route 114 in the Riverstone Terraces Area

Riverstone Terraces is relatively expensive to serve by public transport, as it is located on the opposite side of the Hutt River from all activity centres (including all schools) and is only accessed by one road, which adds distance (and cost) to trips without adding to the catchment, and negates the use of through routing.

An additional and unique problem is that a road barrier prevents right hand turns from State Highway 2 into Moonshine Road, which prohibits the use of the most efficient route and requires buses returning from Riverstone Terraces to travel indirectly via Whakatiki Street and Shakespeare Avenue. As a consequence, northbound (from Trentham) services must detour via Shakespeare Avenue to serve Upper Hutt College after serving Riverstone Terraces, and southbound (from Upper Hutt) Riverstone Terraces services must travel through Shakespeare Avenue twice in the same direction, both before and after Riverstone Terraces (see Figure 16). The northbound route is used by the existing morning service and the southbound route by the existing afternoon service.

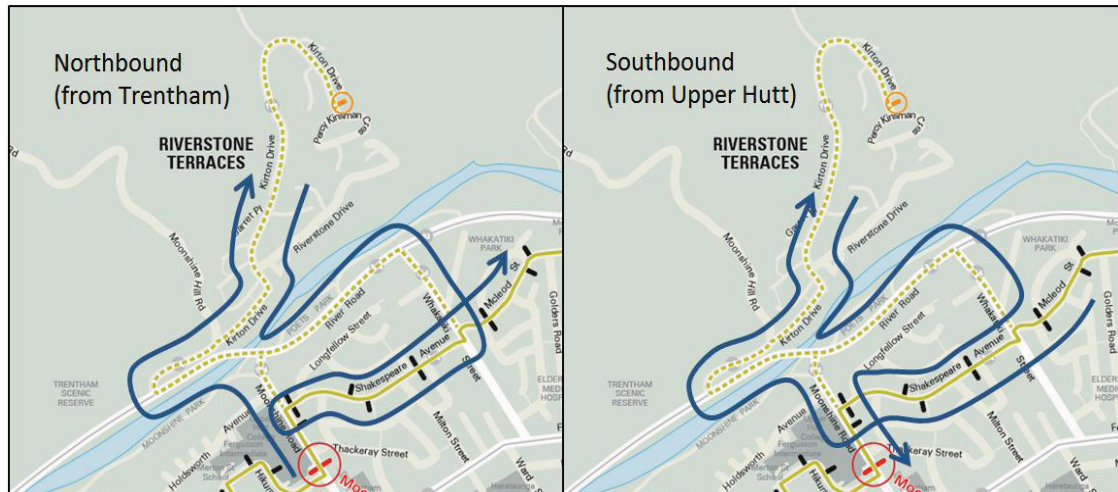


Figure 16: The Required Northbound and Southbound Routings of Riverstone Terraces Services

The previous stage of this review identified Riverstone Terraces as one of the more significant Hutt Valley urban areas that does not have a regular bus service. A survey of local residents was therefore conducted to identify community priorities in the event that the existing service is upgraded to a more regular bus service. The survey is summarised in a separate Riverstone Terraces Survey Report, but its key findings from a service design perspective are:

- Preferred destinations:
 - Upper Hutt Station or CBD is the most-preferred individual destination by a considerable margin, both for weekday and weekend travel;
 - Silverstream Station or shops and Trentham Station are also noteworthy individual destinations that, along with Upper Hutt Station, reflect the 8.1% of the Riverstone Terraces residents that used the train for their journey to work on the 2013 census day;
 - None of the schools figure as significant individual destinations, but Silverstream School and Upper Hutt College are the most prominent of these;
 - Upper Hutt Station and CBD and destinations in their immediate vicinity are preferred destinations for 39% of weekday and 93% of weekend travel;
 - Silverstream Station and shops and destinations in their immediate vicinity are preferred destinations for 31% of weekday and 4% of weekend travel; and
 - Trentham Station and destinations in its immediate vicinity preferred destinations for 15% of weekday and 4% of weekend travel.
- Preferred travel times:
 - 7:00-9:00, 16:00 and 18:00 are preferred weekday travel times;
 - 10:30 is preferred in the weekend; and
 - Potential demand is low at all other times.

From the survey, it was concluded that an upgraded service should prioritise:

- Travel to the Upper Hutt Station and CBD over the other potential anchor points; and

- Travel in the weekday morning and afternoon peak periods, at times that facilitate both school and commuter travel.

The regular Route 114 runs on weekdays between 6:40 and 19:06, and connects to approximately every second train at Trentham Station. It is not scheduled to connect to trains at Upper Hutt Station, although some unscheduled connections can be made there. Route 114 patronage is relatively low compared to most other Hutt Valley bus routes.

7.2.2 Options

Three options for Riverstone Terraces are compared in Table 14.

Option	Advantages	Disadvantages
Status quo	<ul style="list-style-type: none"> Provides a relatively low cost public transport service to the Riverstone Terraces area 	<ul style="list-style-type: none"> Only really caters for school journeys, since the service runs at school times and on school days only Serves a limited number of destinations.
Replace the existing Route 114 Riverstone Terraces trips with a new weekday peak-only Riverstone Terraces route that provides two morning and two afternoon return trips between there and Upper Hutt Station. Regular Route 114 services would continue to run.	<ul style="list-style-type: none"> Would offer an enhanced service that would cater directly to the Riverstone Terraces community preference for a service that is oriented to Upper Hutt Station and facilitates school and commuter travel. 	<ul style="list-style-type: none"> Would cost approximately 26% more than the present service, based on additional costs of 15,500 km and 1050 hours per annum Is likely to require an additional peak vehicle Is likely to duplicate Route 114 trips on the section between Upper Hutt College and Upper Hutt Station.
Change Route 114 so that all trips run via Riverstone Terraces and connect with the train at both Trentham and Upper Hutt Stations where possible. This option requires the overall route frequency to reduce.	<ul style="list-style-type: none"> Would offer a considerably enhanced service to Riverstone Terraces, by providing regular trips rather than the current one in each direction As a result, an additional 496 households would have access to a regular bus service Would provide better train connections at Upper Hutt to all users of the service, which may make the service more convenient for some to use. 	<ul style="list-style-type: none"> Would cost approximately 9% more than the present service, based on additional costs of 33,500 km and savings of 770 hours per annum Would reduce service levels for other passengers, who would have access to fewer trips than the current 13 southbound and 15 northbound, and fewer train connections at Trentham Trentham-Upper Hutt passengers would have a much longer and much less direct journey.

Table 14: Riverstone Terraces Services Options

The new bus route in the second option would follow the route of the existing morning and afternoon Riverstone Terraces service between the Riverstone Terraces turning point and Upper Hutt Station.

The bus route in the third option (changing Route 114 so that all trips run via Riverstone Terraces) would follow the route of the existing Riverstone Terraces services between Trentham and Upper Hutt in both directions. It would have to be carefully timetabled and

run to enable it to maximise the level of service. The suggested timetable, on which cost estimates are based, is shown in Table 15. This provides ten trips in each direction, with peak trips that connect to key peak trains and a low frequency off-peak service. This timetable allows a slightly longer running time than the current Riverstone Terraces trips, but no layover time during peak periods.

Northbound from Trentham Station to Upper Hutt Station										
Train arrive	-	-	-	9:45	11:15	12:45	14:15	15:45	16:51	17:56
Trentham	6:00	7:10	8:20	9:50	11:20	12:50	14:20	15:50	17:00	18:10
Riverstone	6:16	7:26	8:36	10:06	11:36	13:06	14:36	16:06	17:16	18:26
Upper Hutt	6:35	7:45	8:55	10:25	11:55	13:25	14:55	16:25	17:35	18:45
Train depart	6:40	8:00	9:00	10:30	12:00	13:30	15:00	-	17:40	19:00
Southbound from Upper Hutt Station to Trentham Station										
Train arrive	-	7:31	8:50	10:20	11:50	13:20	-	16:17	-	18:44
Upper Hutt	6:35	7:45	8:55	10:25	11:55	13:25	15:15	16:25	17:35	18:48
Riverstone	6:54	8:04	9:14	10:44	12:14	13:44	15:34	16:44	17:54	19:07
Trentham	7:10	8:20	9:30	11:00	12:30	14:00	15:50	17:00	18:10	19:23
Train depart	7:23	8:35	9:35	11:05	12:35	14:05	-	17:04	-	19:35

Table 15: Suggested Route 114 Timetable that Serves Riverstone Terraces Throughout the Day

7.2.3 Recommendations

- (i) Change Route 114 so that all trips run via Riverstone Terraces and connect with the train at both Trentham and Upper Hutt Stations where possible. This would offer a considerably enhanced service to the Riverstone Terraces area, by providing regular trips rather than the current one in each direction, and better train connections to all passengers in Upper Hutt; but would reduce service levels for other passengers outside of Riverstone Terraces and cost approximately 9% more than present.
- (ii) Regardless of the option selected, it is recommended that new and permanent bus stops are installed on the bus route in Riverstone Terraces, to replace the current hail and ride arrangement. This would give the bus service a more permanent presence, which would assist with promotion, and it would provide better information on usage. Permanent bus stops should be considered as essential requirements for Options 2 and 3.
- (iii) Finally, it is noted that the Riverstone Terraces options may be affected by the options discussed in Section 7.3. It is therefore recommend that they are considered in parallel.

7.3 Service Efficiency

7.3.1 Issue

In spite of their important access function, Upper Hutt local services are not well-patronised, although with the exception of Route 115, they generally fall within utilisation guidelines.

Several factors are likely to influence local route patronage:

- The local routes serve low-medium density areas and have low frequencies, and these characteristics tend to naturally result in comparatively low patronage levels;
- All of the local routes serve the Upper Hutt CBD (Upper Hutt City's key employment and service centre and primary public transport hub), but this requires Routes 112 and 115 - which each have relatively small exclusive catchments – to travel some distance in parallel with core services that offer higher service levels;
- Some of the key destinations (e.g. both state secondary schools, both intermediate schools, and the employment centres at Trentham and Montgomery Crescent) are located elsewhere in the city and the local network does not cater well to journeys that require travel beyond the Upper Hutt CBD in each direction;
- All local route timetables are designed to provide planned train connections, but these are subject to rail reliability, particularly outward journeys that require transfer from rail to bus, and there is some evidence to suggest that previous rail reliability problems may have discouraged some bus-rail travel; and
- Upper Hutt local services are provided by some of the oldest vehicles in the Wellington bus fleet, and these may not be attractive to potential passengers.

Particular note should be made of Route 115, which performs adequately at school times (where it appears to cater for travel to Heretaunga College), but is generally under-used by passengers at other times. This route provides the only public link to Pinehaven¹⁰ and the southern side of Silverstream, but otherwise parallels, (and essentially competes with), the railway line and core Route 110 between Silverstream and Upper Hutt Station, which may explain the low patronage level.

There may be a number of opportunities to improve the efficiency of the local network, while still providing a reasonable level of service to the community. Some of the options are explored at high level in the following section.

7.3.2 Options

Seven options that may improve the efficiency of local services are compared in Table 16.

¹⁰ The 2013 census indicates that Pinehaven has a resident population of 2691 at 999 addresses.

Option	Advantages	Disadvantages
<p>Eliminate the loop that local services make in the Upper Hutt CBD, so that they take a more direct route to/from Upper Hutt Station and follow the same path in both inbound and outbound directions.</p>	<ul style="list-style-type: none"> • Would eliminate considerable duplication and save approximately 20,000 km per annum • Would provide a more direct link to the station, with an associated time saving for passengers (approximately 2 minutes), which may make bus-train connections more attractive • Is likely to make the routes more legible in the CBD. 	<ul style="list-style-type: none"> • Would require local route passengers to walk up to 600 metres further to access to some supermarkets and services (including a large health centre) • Would reduce coverage slightly, requiring Ebdentown residents to walk up to 300 metres further to catch a bus (although it is likely that the majority will currently do that at present, to access higher-frequency services at the station area).
<p>Introduce through-routing, so that Route 111 and 112 in the north are each paired with one of the southern routes Route 114 or 115.</p>	<ul style="list-style-type: none"> • Could be selected separately from the CBD option above, but would complement that option and mitigate some of its effects by allowing passengers to travel through the CBD to Wakefield Street in the north and Main Street in the south, reducing the access distance from 600 to 300 metres • Would allow school students from the northern side of Upper Hutt to travel to the secondary and intermediate schools that are all located south of the CBD, which may reduce or eliminate the need for some of the existing school bus routes • Would allow some other passengers to travel to other destinations beyond the CBD without needing to transfer there. 	<ul style="list-style-type: none"> • Would have to be carefully timetabled to ensure that train connections and vehicle utilisation are maximised, given the differing lengths and current frequencies of the routes.
<p>Truncate Route 115, so that it runs only between Silverstream Station and Pinehaven, and discontinue service over the remainder of the route.</p>	<ul style="list-style-type: none"> • Would save approximately 48,400 km per annum • The most logical option would provide a half-hourly service to the Pinehaven/Silverstream areas, which would effectively double the frequency and provide a connection to every train in the peak. 	<ul style="list-style-type: none"> • Would require all passengers travelling between Pinehaven/Silverstream and the north to connect to a train or Route 110 at Silverstream - it is recommended that an integrated ticket be introduced to address resulting fare issue if this option is chosen • Wallaceville industrial area

Option	Advantages	Disadvantages
		<p>and some addresses in the Trentham and Heretaunga and Wallaceville residential areas would lose 500 metre access to a public transport service.</p>
<p>Extend Route 114 south from Trentham Station, to replace Route 115 from there to Pinehaven, and discontinue service over the northern section of the route.</p>	<ul style="list-style-type: none"> • Would save approximately 43,500 km and 3000 hours per annum • Would provide a direct public transport link between the Pinehaven, Silverstream and Heretaunga areas, and Upper Hutt College and Fergusson Intermediate (the locally-zoned public schools), which may reduce or eliminate the need for some of the existing school bus routes • Would maintain the link to the Upper Hutt CBD, which would mitigate the requirement to connect to another service in the above option • This route would form a second spine route running the length of Upper Hutt, particularly if it was to be combined with either Route 111 or 112 north of Upper Hutt Station. 	<ul style="list-style-type: none"> • Would have to be carefully timetabled to ensure that train connections and vehicle utilisation are maximised, given the differing lengths and current frequencies of the routes • Wallaceville industrial area and some addresses in the Trentham and Heretaunga and Wallaceville residential areas would lose 500 metre access to a public transport service.
<p>Change Route 110 services so that they loop through the Brown Owl, Birchville, Timberlea and Maoribank areas, and discontinue all Route 112 services. Retain school bus services to Te Marua.</p>	<ul style="list-style-type: none"> • Would save approximately 201,500 km and 5600 hours per annum • Would reduce the peak vehicle requirement by two • Would eliminate a considerable amount of service duplication from Maoribank southwards • Would provide a much higher level of service (frequency, hours and days of operation) to the Timberlea and Maoribank areas. 	<ul style="list-style-type: none"> • The Te Marua area, which the 2013 census indicates has a resident population of 1152 at 405 addresses, would lose all public transport service • Bus stops in the affected area had 0.9 boardings per trip during March 2014 • The nearest services would be located at Gemstone Drive or Norana Road (revised Route 110) or at Maymorn Station (Wairarapa train services) and neither location is safely accessible by foot from Te Marua • The Route 110 Emerald Hill terminus would be lost, so the route would need to be re-timetabled and a layover

Option	Advantages	Disadvantages
		<p>built into the Upper Hutt Station stop in one direction</p> <ul style="list-style-type: none"> Some existing bus shelters would be located on the incorrect side of the street and would not be served – these would need to be shifted to maintain the existing service quality Route 112 currently meets utilisation guidelines, so it may be inappropriate to remove services.
<p>Discontinue Route 111 and 112 weekend services</p>	<ul style="list-style-type: none"> Would save approximately 4680 km and 650 hours per annum on Route 111 Would save approximately 22,100 km and 627 hours per annum on Route 112. 	<ul style="list-style-type: none"> Some Route 111 passengers would be affected, as Saturday services had 2.3 boardings per trip at the nine Totara Park bus stops during March 2014 Some Route 112 passengers would be affected, as Saturday services had 3.1 boardings per trip at the eleven southbound Te Marua/Timberlea/Maoribank bus stops that are exclusively served by this route during March 2014 These services currently meet the utilisation guidelines.
<p>Simplify school bus services, so that they follow a consistent pattern and complement the regular public transport network. It is recommended that school services consistently follow the Route 930 route north of the CBD, to serve the northern suburbs of Upper Hutt (excluding Totara Park).</p>	<ul style="list-style-type: none"> Would follow a consistent pattern and be easier to understand Would not duplicate or compete with the standard public transport network May allow some school routes to be discontinued. 	<ul style="list-style-type: none"> It appears that vehicles currently make two trips, firstly to serve primary and intermediate schools, and then to serve secondary schools – longer routes such as Route 930 may be more expensive to operate if vehicle utilisation is reduced.

Table 16: Local Route Service Efficiency Options

Figure 17 shows the current routes used by Routes 111 (dark blue), 112 (light blue), 114 (light green) and 115 (dark green) in the Upper Hutt CBD. A cost estimate for the first option (eliminating the CBD loop) assumes that the northern Routes 111 and 112 would travel via Fergusson Drive – Wakefield Street – Main Street – Fergusson Drive in both directions, and southern Routes 114 and 115 would travel via Fergusson Drive – Wilson Street – Main Street in both directions. The Wakefield Street and Wilson Street bus stops would therefore continue to be served, along with those at Upper Hutt Station. The two pairs of bus stops in Queen Street lose regular bus services, however total boardings across the four stops averaged just over half a boarding per trip during March 2014, so the effect on passengers is not expected to be significant.

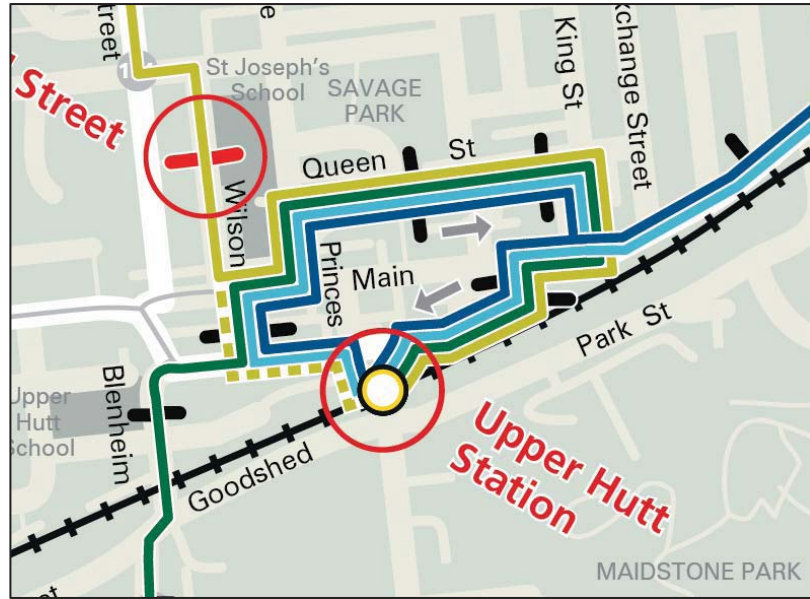


Figure 17: Current Routes used by Upper Hutt Local Services in the CBD Area

Figure 18 shows the suggested route of the Route 110 loop option. This could run in either a clockwise or anti-clockwise direction, but may be most practical to operate as shown, since this eliminates a problematic right turn from Akatarawa Road into State Highway 2.

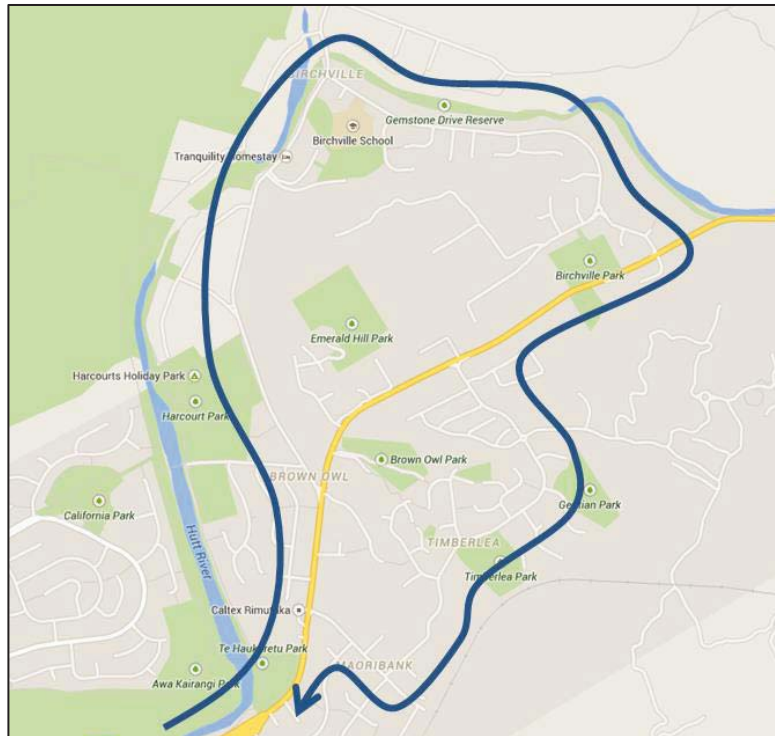


Figure 18: Suggested Route 110 Loop Option

7.3.3 Recommendations

- (i) Investigate all of the above options further, to determine which, if any, may be appropriate. Particular attention should be paid to the points of service duplication and to catering for passenger journeys within Upper Hutt that involve travel beyond the Upper Hutt CBD, particularly to the state intermediate and secondary schools. The latter may provide opportunities to reduce the school bus requirement.

- (ii) Investigate train performance at meeting scheduled arrival/departure times at Upper Hutt, Trentham and Silverstream stations, to determine whether these are being delivered to an acceptable standard and allow connections to take place as planned, given the key role of train connections play in the Upper Hutt network. Particular focus on the performance of northbound train services from Wellington will be required, where the success of bus connections is likely to be heavily influenced by the reliability of rail services at meeting scheduled arrival times at the three Upper Hutt connection points.

8. Other Considerations

8.1 East-West Bus Link Between the Hutt Valley and Porirua

8.1.1 Issue

There is currently no regular public transport link between the Hutt Valley and Porirua, although some exempt services run between the two points. An Upper Hutt-Porirua bus service was trialled in 2002, but was discontinued due to low patronage and high operating costs.

Although services on this corridor are not specified as being integral to the public transport network in the current 2014 Regional Public Transport Plan, there have been frequent and repeated requests for a better public transport link over this corridor, and limited east-west connectivity is noted as one of the regional transport pressures and issues in the recent draft Regional Land Transport Plan summary brochure. The 2010 Regional Land Transport Strategy noted *a need for better east-west connections to improve access, efficiency and reliability for trips between the Hutt Valley, Wellington and Porirua*, and commented that, while State Highway 58 caters to road journeys, *public transport trips between the Hutt Corridor and Western Corridor require travel towards Wellington City and then a transfer back out*. As an example, a journey between Taita and Porirua by car takes approximately twenty minutes, while one by public transport takes four times as long at approximately one hour and twenty minutes.

An east-west public transport link is likely to be justifiable primarily on strategic grounds, by improving accessibility through the provision of a direct connection between the Hutt Valley population of around 140,000 and key activity centres such as Hutt Hospital and Upper and Lower Hutt CDBs in the east, and the Tawa/Porirua/Kapiti population of approximately 120,000 and key activity centres such as the Porirua CBD and Paraparaumu in the west.

State Highway 58 provides the most direct route between the Hutt Valley and the Western Corridor, but has a limited population base, although population at the western (Whitby) end has grown significantly over the last decade as the area has been developed. The new Transmission Gully motorway may lead to further development in the Pauatahanui-Judgeford area.

Approximately 15,000 vehicles use the State Highway 58 route per day, which demonstrates that there is demand for travel on this corridor and that there may be potential demand for a new public transport service. If a public transport service was introduced and could attract 5% of the current vehicle drivers (assuming vehicle occupancy of 1.0), 750 public transport trips would be made per day, which may be sufficient for the service to be viable.

8.1.2 Options

Three east-west bus link options are compared in Table 17, supported by additional information in Appendix G. Other than the status quo, the two illustrative options are:

- a Manor Park Station-Paremata Station shuttle bus route (see suggested route in Figure 19) that is envisaged as being linked directly to the rail service to provide onward

connections north and south, which is the shorter-distance (and hence lower cost) option that serves a lower population base and few destinations; and

- a Queensgate-Porirua bus route (via Hutt Hospital, Manor Park and Whitby - see suggested route in Figure 20) that is envisaged as operating as more of a conventional bus route with bus connections at each end and rail connections at Manor Park and Porirua, which is the longer-distance (and hence higher-cost) option that serves a higher population base and a greater number of destinations.

It has been assumed that, if introduced, both options would initially operate for approximately twelve hours a day (e.g. 6:30-18:30) on weekdays only, but would provide the maximum number of trips achievable within that period using a single peak vehicle to minimise costs. Because the Manor Park Station-Paremata Station option would operate over a shorter distance, a single peak vehicle is expected to be able to provide an hourly service with twelve trips in each direction. This would allow it to connect with every third peak train and every second off-peak train. The Queensgate-Porirua option would operate over a longer distance, and a single peak vehicle is therefore only expected to be able to provide a two-hourly service with six trips in each direction.

Option	Advantages	Disadvantages
Status quo (no public transport link between the Hutt Valley and Porirua)	<ul style="list-style-type: none"> • No cost to the public purse. 	<ul style="list-style-type: none"> • Existing direct public transport options are limited, or very indirect and slow.
Manor Park Station-Paremata Station shuttle bus linked to the rail service	<ul style="list-style-type: none"> • Would provide a minimum cost alternative with an hourly frequency that would provide multiple travel opportunities to the community • Would be expected to halve the public transport travel time between Hutt Valley and points on the Western Corridor, by eliminating the requirement to travel via Wellington • Would connect most key population, employment and activity centres via the Hutt Valley and Kapiti rail lines • Would provide regular public transport service to the Pauatahanui-Judgeford area and the neighbouring areas that have been recently developed in Whitby • Could be operated from either the Hutt Valley or Porirua ends. 	<ul style="list-style-type: none"> • Would cost approximately 92,400 km and 3000 hours per annum, plus a peak vehicle • Would require most passengers to connect to another service at one or both ends • A suitable fare structure would need to be developed, ideally providing integrated fares with rail, since this bus route would effectively operate as an extension of the rail network.
Queensgate-Porirua bus service (via Hutt Hospital, Manor Park and Whitby)	<ul style="list-style-type: none"> • Would provide a higher cost lower-frequency alternative offering connection-free travel for a larger range of 	<ul style="list-style-type: none"> • Would cost approximately 105,900 km and 3000 hours per annum, plus a peak vehicle

	<p>journeys than the other option</p> <ul style="list-style-type: none"> • Would be expected to halve the public transport travel time between Hutt Valley and points on the Western Corridor, by eliminating the requirement to travel via Wellington • Would connect most key population, employment and activity centres via bus and train connections at Queensgate, Manor Park and Porirua • Would provide regular public transport service to the Pauatahanui-Judgeford area and the neighbouring areas that have been recently developed in Whitby • Could be operated from either the Hutt Valley or Porirua ends. 	<ul style="list-style-type: none"> • Would offer a lower frequency than the alternative option • A suitable fare structure would need to be developed.
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Table 17: Hutt Valley and Porirua Bus Link Options



Figure 19: Suggested Manor Park Station-Paremata Station Shuttle Bus Route



Figure 20: Suggested Queensgate-Porirua Bus Route

8.1.3 Recommendations

- (i) Further investigate the feasibility of an east-west bus link between the Hutt Valley and Porirua. It appears that such a service may be viable from these high-level analyses, but further work is required to determine whether it is workable and a community priority, given that cost neutrality constraints require such a service to be funded from savings from other services.
- (ii) Of the two bus link options presented, the Manor Park Station-Paremata Station shuttle bus linked to the rail service appears to offer most of the benefits of the other option, but also offers a higher frequency and lower cost, and may provide a better return to the community than the other option. Either way, a suitable fare structure would need to be developed, since the Manor Park Station-Paremata Station route runs within a single zone and the Queensgate-Porirua route is a three-zone journey under the current zonal system, and neither fare may sufficiently reflect the distance travelled. It is suggested that a zone boundary would need to be added in the Judgeford area to make the services more viable. Both options would also benefit from free transfers at either end, particularly the Manor Park Station-Paremata Station option, which would be built around rail connections.

8.2 Infrastructure Recommendations

During the course of this review several infrastructure issues have been identified that require combined GWRC, Hutt City Council and NZ Bus effort to address. These are:

- (i) **Queensgate:** The group of bus stops in the immediate vicinity of Queensgate form the most important public transport interchange in the Hutt Valley. However, the stop layout and facilities at this location are poor, particularly with regards to seating and shelter, and it is likely that some potential passengers are being deterred from using public transport as a result. Given the importance of this location within the regional public transport network, it is recommended that some priority be given to finding a permanent and customer-focussed solution.
- (ii) **Petone Station:** Road access to this bus-train interchange changed several years ago, and some bus stops were moved, when traffic lights were installed at the intersection of Jackson Street and Hutt Road. This appears to have had a detrimental effect on bus operations in the area. It is recommended that further investigation be undertaken of the options at this location.
- (iii) **Hutt Hospital:** This location is a key node on the network with high boardings and high service frequency. However, bus facilities are poor, particularly in the northbound direction, where the existing bus shelter is only able to accommodate approximately five people. Additionally, the bus stops in this location can only accommodate one bus at a time, which causes problems when two buses arrive at the same time. It is therefore recommended that priority be given to improving and enlarging the bus shelters and lengthening the bus stops at this location, so that they can function more effectively.

9. Conclusion

This report has provided a set of options and recommendations for future action or further investigation for the Hutt Valley bus network. Some would result in cost savings if implemented, while others would result in cost increases. The final cost to the community and its degree of cost-neutrality will therefore depend on the mix that is chosen by GWRC.

The recommendations, if implemented as a group, would change the balance slightly away from general coverage towards ensuring that the routes that are provided offer appropriate frequency, viable connections and key network links (such as the east-west bus link between Hutt Valley and Porirua).

It is recommended that the community, the incumbent operator, and potential future operators are all consulted prior to any final decisions being made on the recommendations or other options, to ensure that the resulting service changes are sustainable over the long term.

Whatever recommendations are adopted, it is considered important to recognise and acknowledge that bus-train interchanges play a critical role in the Hutt Valley bus network, and that it is essential to ensure that the public transport network functions as an integrated whole.

TDG Ltd

Appendix A

Naenae (Route 130) Background Information

Appendix B

Western Hills (Routes 145, 150, 154) Background Information

Appendix C

Wainuiomata (Routes 160, 170) Background Information

Appendix D

Stokes Valley (Routes 120, 121) Background Information

Appendix E

Upper Hutt (Route 110) Background Information

Appendix F

Upper Hutt Local (Routes 111, 112, 114, 115) Background Information

Appendix G

Other Considerations Background Information