

Connections Analysis and Recommendations

Report

Objective

- To identify practical and effective solutions to enable GW to oversee and monitor timetabled connections on an on-going basis.
- To identify practical and effective solutions to enable Operators to manage timetabled connections on an on-going basis.

Scope

To consider

- Customer expectations.
- Contract management (abatements/incentives).
- Practical and effective solution(s) that are easy for customers, operators and drivers to understand and implement.

In scope

- Bus to bus timetabled connections in the Wellington area only (Units 1 to 8).

Out of scope

- Bus to bus timetabled connections for the Kapiti and Wairarapa areas.
- Note: There are no bus to bus timetabled connections for the Hutt Valley and Porirua areas.
- Rail to bus timetabled connections.

Supporting Documents:

- Schedule 2 extracts from Unit Agreements.
- Operational Contract Guides (Draft versions).
- Hubs spreadsheet, including more detail on each of the contracted connections.
- Working Timetables, updated with scheduled wait times and proposed solution(s) for each timetabled connection in every timetable.

Approach

Tasks performed

1. Prepared a 1 page summary defining how connections can be classified, along with potential solutions.
2. Reviewed Schedule 2 of the relevant Unit Agreements to identify contracted connections.
3. Provided more detail on each of the timetabled route connections in the Hubs spreadsheet, namely:
 - Contracted vs non-contracted
 - Number of connections (for peak, off-peak, Sat, Sun and evenings).
 - Frequency of service (for peak, off-peak, Sat, Sun and evenings).
 - Start vs mid-trip connections.
 - Proposed solutions for the short and long term.
 - Presence of connections in both the working timetables and customer printed timetables.
 - Min and max scheduled wait times.
 - For loop routes, the delay before the subsequent waiting trip is affected.
4. Identified where RTI screens are available and visible to drivers of outbound waiting services.
5. Calculated the scheduled wait time for every contracted connection in every timetable in every Unit in Wellington.
6. Entered the proposed solution(s) for every timetabled connection in every timetable in every Unit in Wellington.
7. Obtained recent reports on connection performance by the operators, and the number of passengers transferring on contracted connections and at other locations.
8. Observed connections in action at Hubs where complaints are prevalent.
9. Reviewed complaints received by Metlink.

Information sources

- Schedule 2 of Unit Contracts
- Working timetables
- Customer printed timetables
- Metlink website
- Patronage Cube (containing patronage data pre July 2018)
- Customer Experience team feedback
- BI reports
- Site visits

Background

Timetabled connections

There are 27 bus to bus route connections where specific connecting trips are listed in both the working timetables and customer printed timetables.

Contracted connections

15 of these route connections are contracted by GW to one of the bus operators, being TranzUrban, NZ Bus or Mana. These route connections are itemised in Schedule 2 of the relevant Unit Agreements.

Non-contracted connections

The remaining 12 route connections are not contracted by GW and do not appear in Schedule 2 of the relevant Unit Agreements.

Non-timetabled connections

Additional route connections are shown as notes in the customer timetable booklets only, but specific connecting trips are not listed and these route connections do not appear in Schedule 2 of the relevant Unit Agreements.

Timetabled connection frequencies

There are 15 contracted route connections and a further 12 non-contracted route connections that are specifically listed in the working timetables and customer printed timetables. These can be categorised by the frequency of service of the outbound waiting vehicles, where High Frequency Services operate every 10 minutes or less and Low Frequency Services operate every 15 to 60 minutes or more.

The frequency of the outbound waiting service determines if and what action(s) are required to manage the connection.

Low Frequency to High Frequency connections

Low Frequency to High Frequency connections will not generally require operator intervention as the inbound customer has a large number of outbound options at their disposal. Generally customers connecting to a high frequency service will have a wait between connections not exceeding 10 minutes, albeit bunching and late running may impact this from time to time. Regardless, intervention by the operator is unlikely to significantly minimise any wait-time.

High and Low Frequency to Low Frequency connections

High and Low Frequency to Low Frequency connections will generally require operator intervention as the inbound customer has a smaller and less frequent number of outbound options at their disposal. Customers connecting to a low frequency service will have a wait between connections

generally between 15 and 60 minutes if a timetabled connection is missed. Intervention to some degree by the operator will be required to minimise the wait-time to acceptable levels.

List of contracted connections

The 15 contracted route connections all correspond to the scenario where passengers are transferring to a waiting outbound service operating at low frequency. 10 of these contracted connections operate like this throughout the bulk of the day (with some exceptions during the peaks), and 5 operate like this in the evenings and/or weekends only.

Contracted connections, by Location and Operator

Location	Inbound Route	Outbound Route	Operator	Contracted connections	Low frequency connections
University	21	22	NZ Bus	Evenings and weekends only	Evenings and weekends only
	21	22	NZ Bus	Evenings and weekends only	Evenings and weekends only
	22	21	NZ Bus	Evenings and weekends only	Evenings and weekends only
	22	21	NZ Bus	Evenings and weekends only	Evenings and weekends only

Note: This excludes R23 to R3 and R29 to R3 in evenings, which do not appear in either the working timetables or customer timetable booklets.

Evening connections

Evening connections will attract a higher level of public scrutiny, given the potential heightened safety risks when travelling after dark.

Number of timetabled connections occurring after 19:30 hours (that may require Comms Centre monitoring and management) -

Unit	Mon-Fri	Sat	Sun
3	22	18	10

Current contract requirements for connections

Operational Management Guides have been prepared for the Operators, and describe the contractual requirements for successful connections as follows.

Waiting vehicles must wait for connecting service vehicle:

- Until the arrival of the connecting service.
- Until four minutes after the waiting vehicle's scheduled departure time, if the connecting service hasn't arrived (17.5.1).
- If the next waiting service is scheduled for 30 minutes or more after the waiting vehicle is scheduled to leave the service connection point (17.5.2A).
- If the waiting vehicle is the day's last scheduled service for that route (17.5.2B).

Waiting vehicle does not have to wait for connecting service vehicle if:

- The waiting vehicle will miss another timetabled service connection as a result (17.6.1).
- It would break any law or Operators' license by waiting (17.6.2).
- The next waiting service is scheduled to depart within 20 minutes (17.6.3)
- The connecting service has no passengers who want to board waiting vehicle (17.6.4).
- The connecting service has been cancelled and not replaced with alternative services (17.6.5).
- GWRC tells Operator in writing that it does not have to wait (17.6.6).

Findings

Current performance and number of passengers connecting

Average % connections met, for each of the contracted route connections:

Location	Inbound	Outbound	% connections met (actual)	% connections met (contract)	Pax transfers per weekday
University	21	22	N/A	58%	7
	21	22	N/A	58%	9
	22	21	N/A	84%	-
	22	21	N/A	84%	-

Note:

- The % connections met (actual) relate to whether connections were physically met, allowing for actual minimum transfer times at hubs.
- The % connections met (contract) relate to whether connections were met under conditions of the contract, allowing for minimum and maximum contracted wait times, and minimum transfer times specified in GTFS.
- Both sets of % connections met are for the first week in October.
- Passenger transfer numbers above have been pro-rata adjusted to include cash and SuperGold transfers.

Classifying Issues regarding timetabled connections

Issues regarding timetabled connections fall into one of two categories:

1. Are the timetabled connections working as planned/designed?
2. Do the plans/designs for timetabled connections meet customer requirements/expectations?

Clarifying connections with customers

Specific connecting trips (both contracted and non-contracted) are shown in the customer printed timetables, but are not shown on the GW website timetables. This can potentially cause confusion for customers, as 84% of customers use the website and 58% use the real time displays and/or the mobile app compared with 36% who use the printed timetables. For example, a day's research at Brooklyn hub showed some customers believe there will always be a waiting route 17 service for every incoming route 7 service.

There is also a possibility that some customers perceive Hutchison Terminus as a hub for timetabled connections; however this is yet to be verified by the Customer Experience report due 3rd week in November

Connections to shuttle loop services

For connections to out-going routes that operate as shuttle loops (routes 12, 17, 18, 19, 28, 60), at least 5 mins delay is available before the next connecting out-going trip is affected.

RTI displays available to waiting customers and drivers

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8 of the 15 contracted route connections have RTI signs readily visible to outbound waiting drivers, showing estimated arrival times of the inbound connecting services. These are located at Johnsonville Stop A, Kilbirnie Stop A, Miramar Shops Stop B, and Victoria University Stops A and B.

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Minimum transfer times between connecting and waiting services

A comparison of the actual minimum transfer times with those loaded into Google Transit Feed Spec

Location	Inbound	Outbound	Min T/fer Time Actual (mins)	Min T/fer Time In GTFS (mins)
University	21	22	0	0
	21	22	0	0
	22	21	0	0
	22	21	0	0

Local Communities

A local community is a group of people living and interacting in a common location such as a neighbourhood or town. Where a sense of shared space and connectedness exists, individuals can rightly call themselves a community.

Local communities tend to have one or more “focal points”, which are places where people from the community will often congregate on a daily basis, such as the main local shopping centre or main railway station for the area.

Customer bus journeys can generally be classed in one of two categories:

1. Journeys within customers’ local communities. Customers expect to travel to and from the focal point(s) in their local community without the need to transfer.
An example where this works successfully is in the Porirua area, where residents can travel to and from the North City Shopping Centre or Porirua railway station (their focal points) on one bus trip.
An example where this does not work successfully is in the Eastern suburbs, where residents from Miramar North and Strathmore Park cannot travel to and from Newtown shops or Wellington Hospital (part of their group of focal points) on one bus trip.
2. Journeys beyond customers’ local communities, such as to and from Wellington CBD or a tertiary place of study. Customers are more accepting that in such cases they may require a transfer to another service to complete their journey.

Transfers tend to be more successful in built-up areas where shops are nearby and there is a high frequency of bus services available to choose from to complete the journey. Conversely transfers tend to be less successful in remote outer areas where the waiting services are operating at low frequency and there are few if any shops nearby.

Observations from Customer Experience Team

The Customer Experience team has recently been out in the field observing and interviewing customers on certain routes. A report on their findings is due in the 3rd week of November.

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University Hub

Findings & Issues:

- Routes 21<->22 connections are difficult to operate, as both routes meet mid-trip and customers can transfer to/from either route.

Solutions to consider:

- No practical solutions are available.

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Targets for contracted connections

- The Operator Contracts contain a nominated Performance Indicator for contracted connections which is reported on but no target appears to be present for Operators to aim for.

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Conclusions:

- The correct route connections have been contracted by GW to the bus operators. Accordingly the list of contracted route connections does not need to be altered.
- The list of individual timetabled connecting trips for each route connection appears to be correct.
- A target between 90% and 95% should be considered for the average % connections met, for each of the 15 contracted connections.
- The rules for waiting vehicles in Schedule 2 of the Unit contracts need to be modified, in order to provide practical and effective solutions to contracted connections.
- ...
- Customers appear to be transferring at many stops across the network, predominantly in built-up areas where there is a high frequency of bus services available to choose from to complete the journey.

Potential Solutions

Set/reset customer expectations.

Benefits: a. Fewer complaints as more customers understand how connections and transfers work.

Dis-benefits: a. Customers may perceive this as a failing of the new network.
b. Message may not reach all affected customers.

Rely on timetabled connections with no formal operator intervention or management

Benefits: a. On average and on current performance, approximately 75% of Contract connections will be secured.

b. Requires limited intervention and operator management.

Dis-benefits: a. On current performance, up to 25% of contract connections will be lost.
b. Outbound connections will be secured on a 'hit and miss' basis.

Rely on timetabled connections with instructions for drivers to manage.

Benefits: a. On average and on current performance, between 75% and 100% of Contract connections will be secured.

b. Requires limited intervention and operator management.

Dis-benefits: a. On current performance, between 0 and 25% of contract connections will be lost.
b. Security of outbound connections will depend on the diligence of individual drives.

Ensure that each contracted connection is secured by holding all outbound connecting services until the inbound service has arrived.

Benefits: a. Outbound connections are secured regardless of schedule adherence.

b. GWRC commitment to minimize waiting time will be maintained.

c. 100% of contracted connections will be secured.

Dis-benefits: a. Outbound late running may impact later departures.

b. Non-connecting passengers may be delayed waiting on late inbound services.

Maximise concurrence with contract connections by manual (process driven) intervention and operator management. Options would be to appoint a Connections Manager in each Comms Centre to manage connections, or to deploy staff at hubs to manage connections.

- Benefits:
- a. Outbound delays will be limited to minimize consequential delays to later services. Eg. Wait no longer than schedule tolerances permit.
 - b. Poor schedule adherence is managed to maximise outbound connections where possible.

- Dis-benefits:
- a. Will not secure all outbound connections.
 - b. High reliance on bus driver compliance.
 - c. Some IT support required.
 - d. Significant operator intervention/management required.
 - e. One size will not fit all.

For contracted connections, increase the level of service of waiting (out-bound) services to remove or reduce the number of low frequency connections. Service levels can be increased using any of the following approaches:

- Operate more outbound “e” services in the afternoon peaks.
- Increase the frequency of outbound waiting services to match the frequency of inbound connecting services.
- Increase the frequency of outbound waiting services to 15 mins.

- Benefits:
- a. Connecting customers will receive a high level of service.
 - b. Connections will not require any management or intervention to work.

- Dis-benefits:
- a. Significant additional cost and resource required.
 - b. Customer demand may not justify increased levels of service.

Recommended Solutions

1. Consider setting a target for each contracted connection

- 1.1. For example, a target between 90% and 95% for the average % connections met, for each of the 15 contracted connections.

2. ...

3. Provide information to customers on connections

- 3.1. Ensure the website timetables identify timetabled connections (both contracted and non-contracted), or at least note that timetabled connections are available and refer customers to the Journey Planner.
- 3.2. Explain to customers how connections will be managed operationally.
- 3.3. Ensure customers are aware of what times the waiting services leave each hub.
- 3.4. Explain timetabled vs non-timetabled connections.
- 3.5. Address the possible misconception amongst some customers that Hutchison is a hub with timetabled connections.

4. Do not manage or monitor connections in the following scenarios

- 4.1. For 12 timetabled connections where the outbound waiting service is operating at 15 mins or less frequency.
- 4.2. Where connections are not timetabled.

5. For 15 timetabled connections where the outbound waiting service is operating at greater than 15 mins frequency (ie 15 contracted connections) -

- 5.1. Instruct drivers that waiting services can be delayed up to 5 mins to wait for late-running connecting services -
 - 5.1.1. Where the RTI display of the in-coming trip can be sighted by the out-going driver –
At scheduled depart time, check RTI display at Hub and wait if the incoming connecting trip is due in 5 mins or less, otherwise depart immediately.
 - 5.1.2. Where the RTI display of the in-coming trip is not available or cannot be sighted by the out-going driver –
At scheduled depart time, contact the Comms Centre and wait if the incoming connecting trip is due in 5 mins or less, otherwise depart immediately. OR
Wait up to 5 mins after scheduled departure time, then depart if the incoming service is not in sight.
- 5.2. Do not penalise operators for late departing waiting services where connections are successful.
- 5.3. Operators' Comms Centres to monitor and manage connections in real time after dark / 19:30.

6. For all timetabled connections, where the outbound waiting service is the last service of the evening -

- 6.1. Ensure that each contracted connection is secured by holding all waiting outbound services until the connecting inbound service has arrived.
- 6.2. Operators' Comms Centres to monitor and manage connections in real time for last connections at night.

7. Ensure local communities are connected to their local focal point(s)

- 7.1. Confirm local communities and focal points identified.
- 7.2. Ensure local communities are seamlessly connected to their focal points, by identifying current barriers to travel and effective solutions.

8. Specific solutions

- 8.1. Consider operating RT's in open channel mode after dark / 19:30.

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9. Finish commissioning report to manage contracted connections

- 9.1. Finish testing the Scheduled Connections Analysis Report and put into production.

Outstanding Issues to be addressed with Operators

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- R21/22 connections during the day on the weekends may require active management by the Operator in order to work.
- The ability to easily place instructions on Drivers Shift Cards needs to be investigated with the Operators.
- Operator's ability/willingness to resource Comms centres in evenings needs to be addressed.
- Operator's ability/willingness to provide open channel RT's in the evenings needs to be addressed.
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Next Steps:

1. Scope costs and timeframes to implement recommendations.
2. Consult with GW's Service Delivery and Contract Management groups.
3. Consult with the Operators affected.
4. Finalise the solutions, prepare recommendations and seek approval to implement.

Appendix 1: List of timetabled route connections, number of connecting trips and frequency of outbound waiting services:

In	Out	Exchange	Destination	Contracted?	Number of Connections					Frequency of Waiting Services				
					Peak	Off-peak	Late	Sat	Sun	Peak	Off-peak	Late	Sat	Sun

21	22	Vic Uni	Wellington	Yes	0	3	5	26	14	20	10	60	30	60
21	22	Vic Uni	Mairangi	Yes	0	3	6	25	14	20	30	60	30	60
22	21	Vic Uni	Wrights Hill	Yes	0	3	6	25	14	10	10	60	30	60
22	21	Vic Uni	Courtenay Pl	Yes	0	3	5	26	14	10	10	60	30	60

** RTI screen showing arrival time of inbound connecting service is not available to driver of outbound waiting service.

Appendix 2: Contracted vs Proposed Solutions – Instructions for Operators:

Scenario		Contracted	Proposed
Time of Day	Frequency of waiting service		
Day	L	Wait four minutes after scheduled departure time (17.5.1), or until the next waiting service is scheduled to depart within 20 minutes (17.6.3)	<p><i>Where the RTI display of the in-coming trip can be sighted by the out-going driver –</i> At scheduled depart time, check RTI display at Hub and wait if the incoming connecting trip is due in 5 mins or less, otherwise depart immediately.</p> <p><i>Where the RTI display of the in-coming trip is not available or cannot be sighted by the out-going driver –</i> At scheduled depart time, check the Metlink app and wait if the incoming connecting trip is due in 5 mins or less, otherwise depart immediately. OR Wait up to 5 mins after scheduled departure time, then depart if the incoming service is not in sight.</p>
Day	H	Wait four minutes after scheduled departure time (17.5.1)	Do not wait if the incoming service is not in sight.
Evening	L	Wait four minutes after scheduled departure time (17.5.1), or until the next waiting service is scheduled to depart within 20 minutes (17.6.3)	<p><i>Where the RTI display of the in-coming trip can be sighted by the out-going driver –</i> At scheduled depart time, check RTI display at Hub and wait if the incoming connecting trip is due in 5 mins or less, otherwise check with Comms before departing.</p> <p><i>Where the RTI display of the in-coming trip is not available or cannot be sighted by the out-going driver –</i> At scheduled depart time, check the Metlink app and wait if the incoming connecting trip is due in 5 mins or less, otherwise check with Comms before departing. OR Wait up to 5 mins after scheduled departure time, then check with Comms before departing if the incoming service is not in sight.</p>
Evening	H	Wait four minutes after scheduled departure time (17.5.1)	Do not wait if the incoming service is not in sight.
Last Trip		Wait for connecting service vehicle (17.5.2B)	<u>Wait for connecting service vehicle.</u> Check with Comms.

L = greater than 15 mins frequency H = 15 mins or less frequency