



Haywards Interchange

Benefits Realisation Review

ABOUT BENEFIT REALISATION REVIEWS

Benefit Realisation Reviews assess how well improvement projects* which received National Land Transport Programme (NLTP) funding have achieved their main expected benefits.



ABOUT THIS REVIEW

PROJECT NAME:	SH2/58 Intersection Improvement ('Haywards Interchange')
RESPONSIBLE ENTITY:	NZ Transport Agency
SITE VISIT/DATA ANALYSIS DATES:	July 2018; Travel time and crash data up to March 2018 used.
REPORT PUBLICATION DATE:	October 2018

* Includes state highway and local road improvements, public transport, walking & cycling, and regional improvement projects.

SUMMARY

HAYWARDS INTERCHANGE IS SUCCESSFULLY DELIVERING ITS EXPECTED BENEFITS

The Haywards Interchange project

This project replaced a signalised intersection connecting SH2 to SH58 on the western side of the Hutt Valley with an interchange. The interchange enables SH2 motorists to travel unimpeded underneath a raised roundabout. Traffic connecting with SH58 or the local Manor Park suburb use the roundabout.

The project also provided a Park & Ride carpark linked to the local railway station by a footbridge and cycling and shared pedestrian/cyclist paths. Project features are illustrated on the page below.

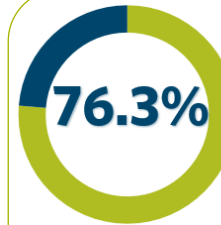
Successful project

This review has found the Haywards Interchange project has achieved its main travel savings-related benefits, although it is too early to conclude on safety outcomes.



The project was constructed at a cost of \$48m (nearly 12% above budget) and officially opened in August 2017.

Expected project benefits



Travel time savings (including improved journey time reliability) made up 76.3% of the predicted monetised benefits

- Other benefits were: crash cost savings (15.2%), vehicle operating cost savings (8.2%), and vehicle emission reduction benefits (0.3%).

Actual summary results

1

Travel time savings

Reduced travel times for motorists using the interchange by up to nearly 1 minute.



2

Journey time reliability

Travel times are now more predictable except for SH2 northbound motorists travelling in the afternoon hitting congestion north of the interchange.



3

Safety

It is too soon to conclude on safety outcomes. There has been a small number of minor-injury and non-injury crashes since the interchange opened.



4

Walking & cycling and public transport benefits

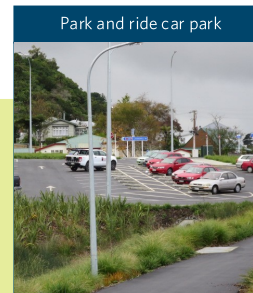
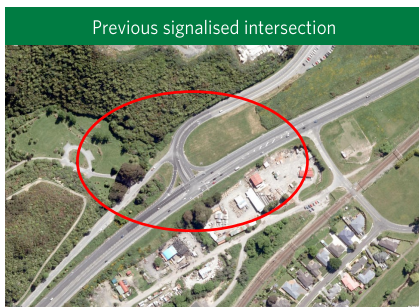
Bike and shared paths safely separate cyclists and pedestrians from other traffic through the interchange. Parking and safe pedestrian access to the local train station has been provided.



PROJECT MAIN FEATURES

A GRADE SEPARATED INTERCHANGE REPLACED A SIGNALISED INTERSECTION

Public transport and walking/cycling infrastructure added



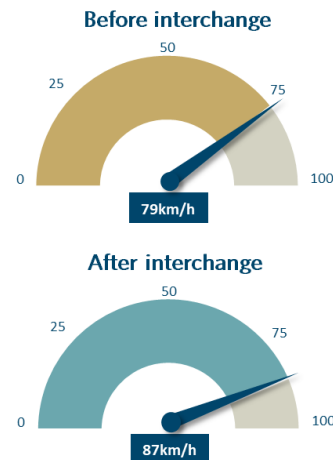
TRAVEL TIMES AND RELIABILITY OUTCOMES ON STATE HIGHWAY 2

REDUCED TRAVEL TIMES ACHIEVED ON SH2 THROUGH THE INTERCHANGE

Average speed improved

8km/h

increase in average speed of vehicles travelling on SH2 as a result of the interchange.



(Average speeds were the same in both directions)



Snapshot travel time saving benefits

Northbound A → B

All day

32

secs

AM Peak

46

secs

PM Peak

16

secs

Southbound B → A

All day

30

secs

AM Peak

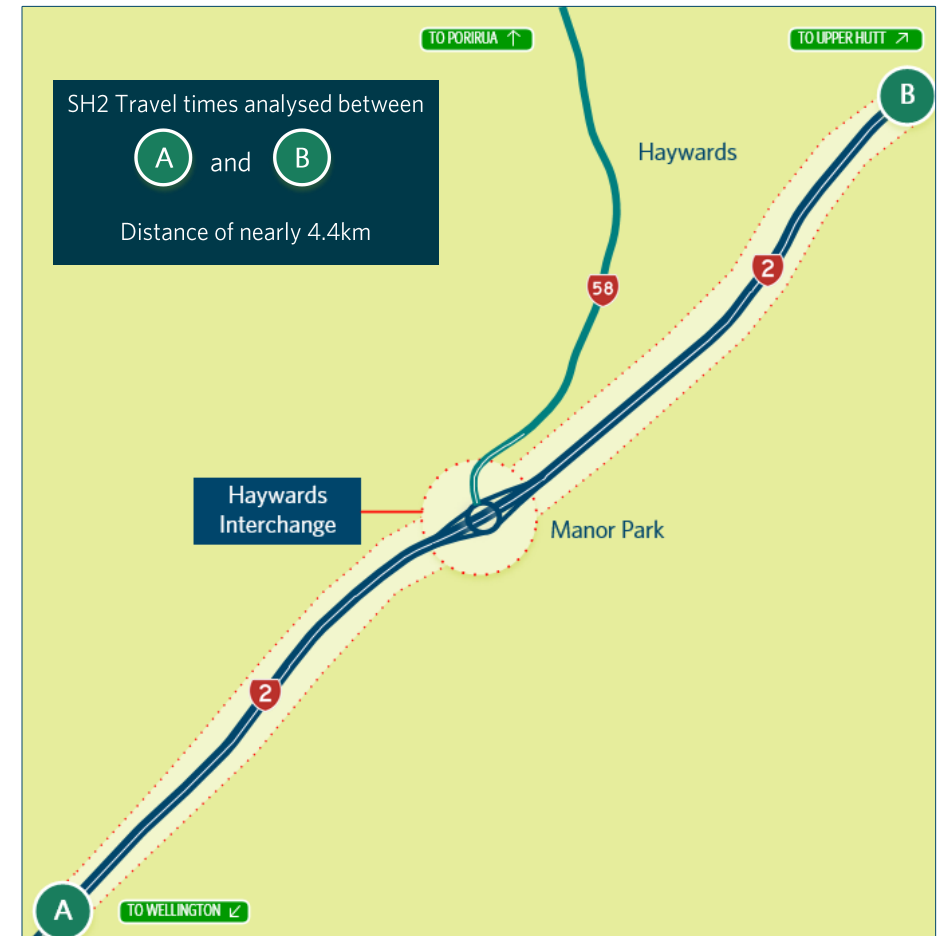
49

secs

PM Peak

30

secs






Coverage and terminology notes

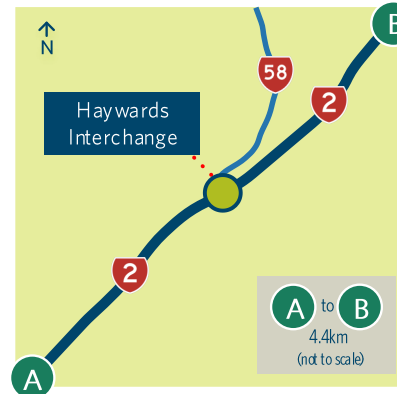
Travel times compared are weekdays March 2015 (pre-construction) with March 2018 (post construction). All day = 7am-7pm, AM Peak = 7-9am, PM Peak = 4-6pm. Public holidays are excluded.

TRAVEL TIMES AND RELIABILITY OUTCOMES FOR STATE HIGHWAY 2 CONTINUED...




BETTER JOURNEY TIME RELIABILITY MOSTLY ACHIEVED FOR SH2 TRAFFIC

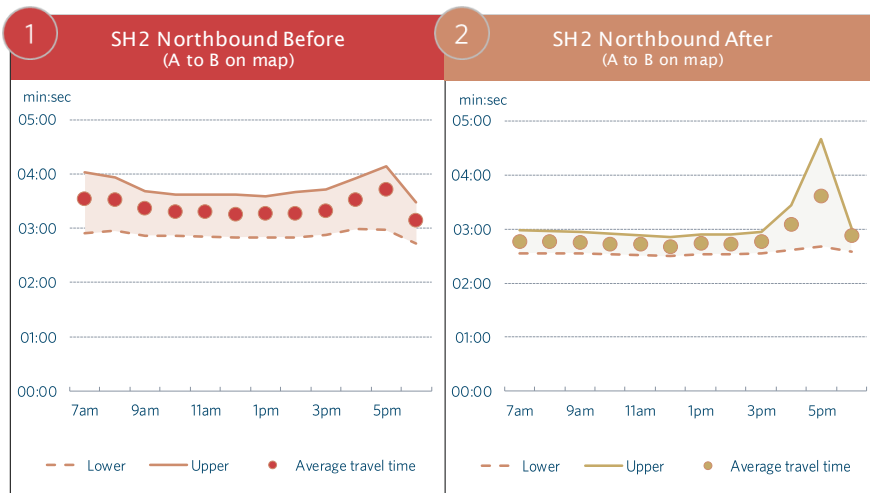
Mixed results for Northbound SH2 traffic


-  Average travel times during weekdays have mostly improved by around **half a minute** with the interchange (figs 1 & 2).
-  Journey time reliability for northbound SH2 traffic through the interchange travelling between 7am and 4pm has significantly improved. Drivers can predict their trips through the interchange (4.4km stretch) will usually take less than 3 minutes, whereas previously trips would vary between 3 and 4 minutes.
-  Average travel times and reliability for people travelling in the afternoon peak period around 5pm have deteriorated with the interchange (this is the 'peak' shown in fig 2). Removal of the traffic signals means vehicles travel faster to the next signalised intersection, at Silverstream Bridge, resulting in queuing back towards the interchange in the afternoon commuter peak.

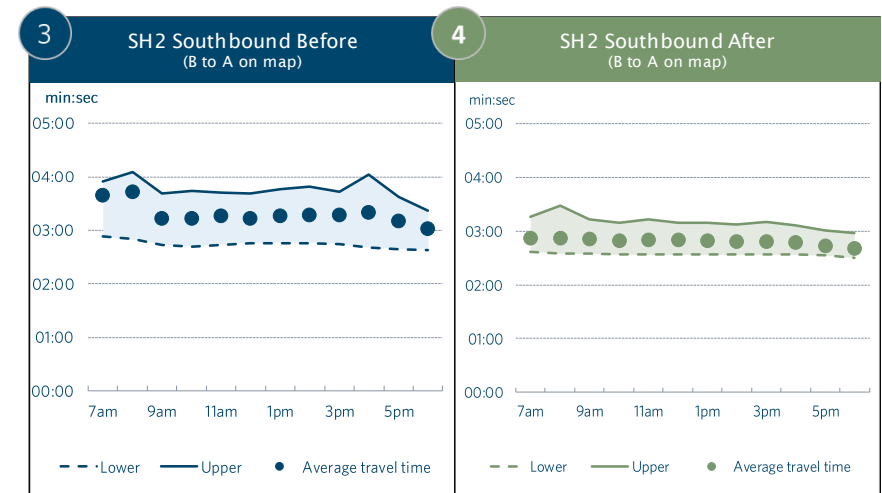


Southbound SH2 time savings and reliability improved

-  Average travel times outside morning commuter peak reduced by nearly **half a minute**. (figs 3 & 4).
-  Morning commuter peak travel times have been reduced by nearly **one minute**.
-  Journey time reliability for southbound SH2 traffic has been improved with the grade separated interchange. Previously travel times tended to vary between 3 and 4 minutes depending on time of day (fig 3). Drivers are now able to predict with a high level of accuracy that their travel from a couple of kilometres north of the interchange to a couple of kilometres south of it will tend to take around three minutes (fig 4).



 **TIP**
See Page 13 of this report for guidance on reading these graphs.



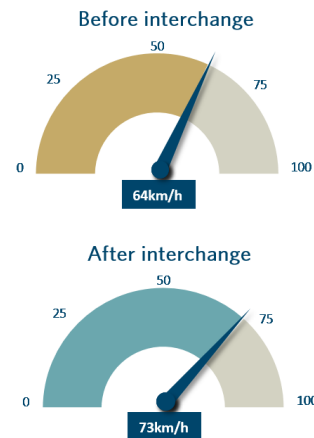
TRAVEL TIMES AND RELIABILITY OUTCOMES FROM STATE HIGHWAY 2 TO 58

MORE EFFICIENT CONNECTION FROM SH2 TO SH58

Average speed improved

9km/h

increase in average speed
of vehicles connecting from
SH2 to SH58 as result of
interchange



(Average speeds were the same in both directions.)



Snapshot travel time saving benefits

Heading **north** on SH2 to SH58

A → C

All day

19
secs

AM Peak

23
secs

PM Peak

22
secs

Heading **south** on SH2 to SH58

B → C

All day

22
secs

AM Peak

15
secs

PM Peak

31
secs



Coverage and terminology notes

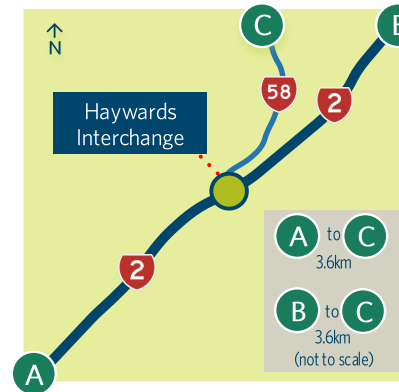
Travel times compared are weekdays March 2015 (pre-construction) with March 2018 (post construction).
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TRAVEL TIMES AND RELIABILITY OUTCOMES FROM STATE HIGHWAY 2 TO 58 CONTINUED...

COMMUTER TRIPS IN THE MORNING AND AFTERNOON PEAKS IMPROVED

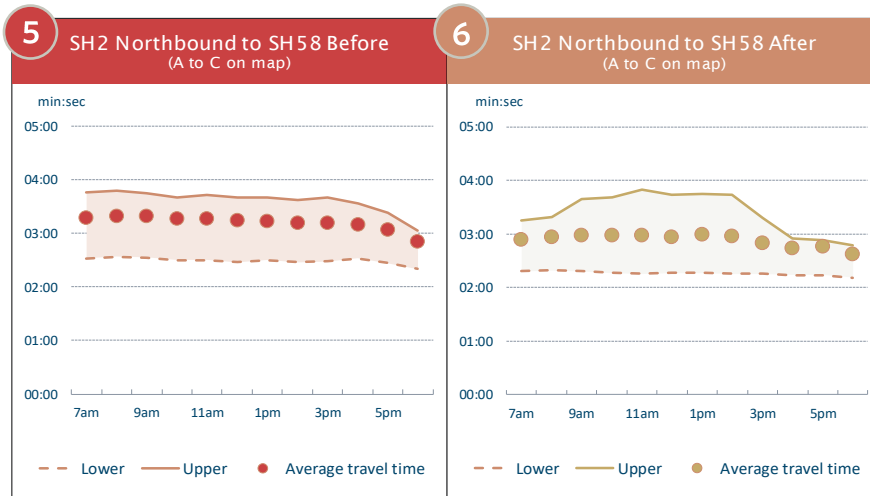
Modest travel time savings for SH2 traffic heading north and connecting to SH58

- Modest average travel time savings of around 20 seconds have resulted from the interchange (figs 3 and 4). Minimal change in travel time savings are to be expected as previously SH2 traffic connecting to SH58 from the south had a free turn and was not impeded by the traffic signals.
- Travel time reliability changes have been mixed. Reliability has improved in the morning and afternoon commuter peaks, but has marginally deteriorated in the inter-peak period (fig 6). It is unclear why this has happened. In quieter traffic conditions some drivers may actually be travelling the route at a more relaxed reduced speed.

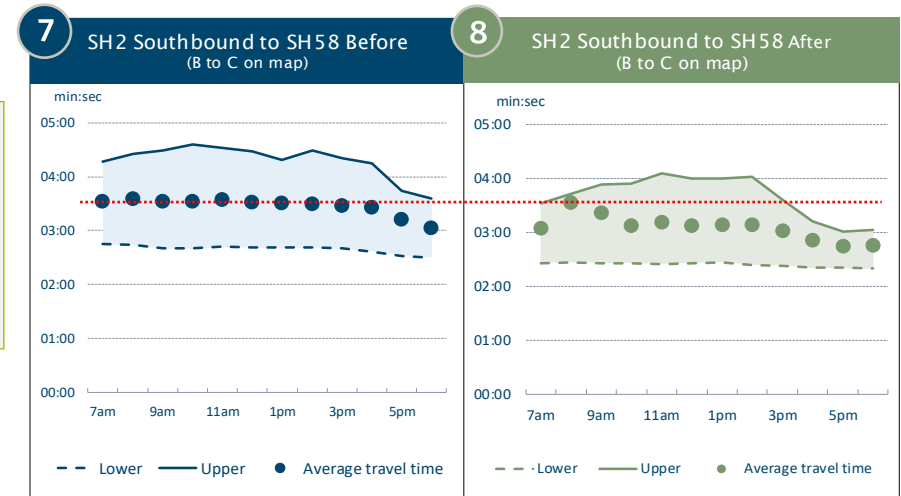


Small changes for southbound SH2 traffic connecting to SH58

- Average travel times during different times of the day have generally reduced by around 20 seconds for SH2 traffic from the north connecting to SH58 (figs 7 & 8). Morning peak traffic times are largely unchanged.
- Travel time reliability has improved in the PM peak. Previously morning travel times would tend to vary between just under 3 minutes and up to 4½ minutes. With the interchange this variability in the PM peak has reduced to between 2½ and 4 minutes.
- At other times of weekdays, typical travel times tend to vary between just under 2½ minutes and up to 4 minutes (fig 8). This is an improvement on the previous tendency for travel times to vary between just under 3 minutes and up to 4½ minutes (fig 7).



TIP
See Page 13 of this report for guidance on reading these graphs.



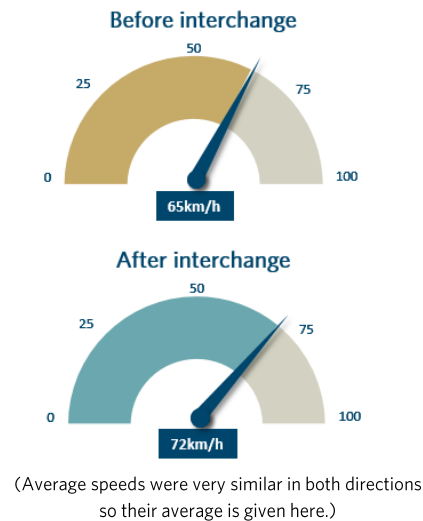
TRAVEL TIMES AND RELIABILITY OUTCOMES FROM STATE HIGHWAY 58 TO 2

BETTER CONNECTION FROM SH58 TO SH2

Average speed improved

7km/h

increase in average speed
of vehicles connecting from
SH58 to SH2 with removal
of traffic signals



Snapshot travel time saving benefits

From SH58 to **Northbound** on SH2 C → B

All day

35
secs

AM Peak

56
secs

PM Peak

12
secs

From SH58 to **Southbound** on SH2 C → A

All day

36
secs

AM Peak

52
secs

PM Peak

45
secs



Coverage and terminology notes

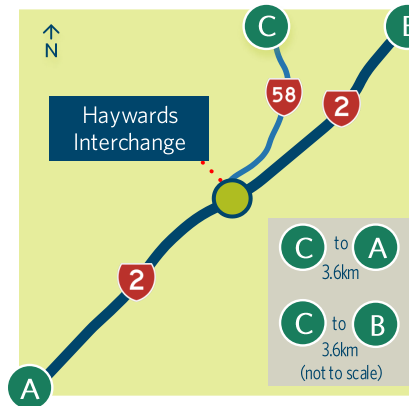
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TRAVEL TIMES AND RELIABILITY OUTCOMES FROM STATE HIGHWAY 58 TO 2 CONTINUED...

CONNECTING FROM SH58 TO SH2 MOSTLY FASTER AND MORE RELIABLE

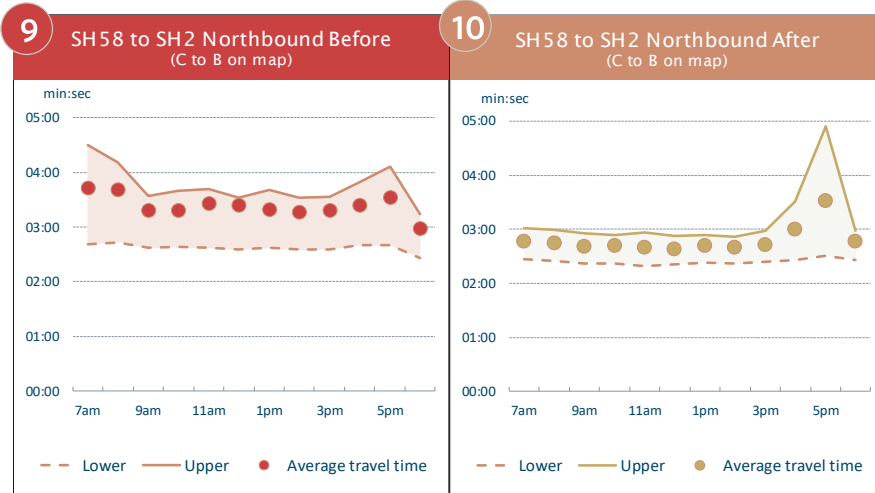
SH58 to SH2 northbound travel times reduced except in PM peak

- Travel times for SH58 traffic heading north on SH2 have mostly improved with the interchange (figs 9 & 10). Across most times of day except the afternoon peak, travel times are consistently under 3 minutes. This compares with travel times of 3½ to nearly 4 minutes with the previous intersection.
- Travel time reliability is generally improved, with predictable journey times of between 2½ and 3 minutes for all times of day except after 4pm. Previously, connecting from SH58 to SH2 northbound could vary from 2½ minutes up to 4½ minutes.
- Travel time reliability in the afternoon peak has deteriorated since the interchange opened (see 'peak' in fig 10). This is from SH2 congestion immediately north of the interchange, with vehicles sometimes queuing back from the next signalised intersection.

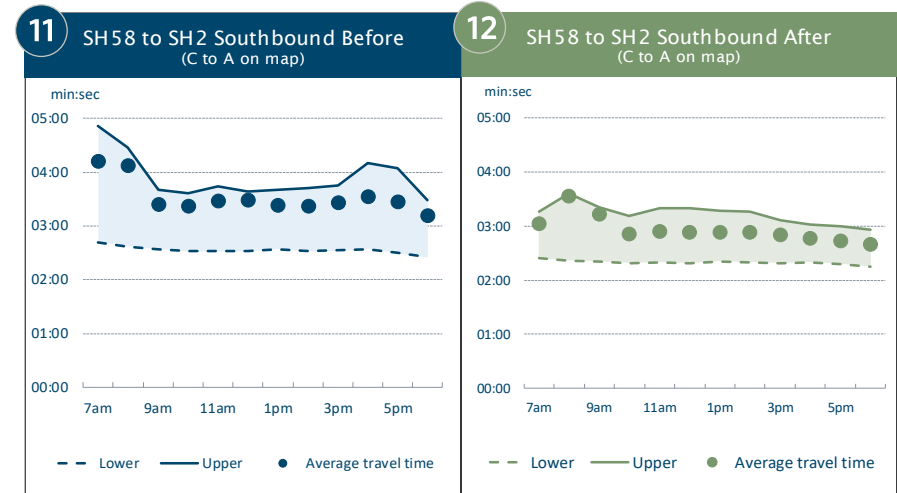


SH58 to SH2 southbound travel faster and more reliable

- Traffic heading from SH58 to southbound on SH2 now often takes less than 3 minutes at most times of day; a saving of around half a minute from previously (figs 11 & 12).
- A morning peak of up to nearly 5 minutes with the former signalised intersection has been reduced down to a maximum of around 3½ minutes.
- Travel time reliability has improved. Drivers can now predict travel from SH58 southbound onto SH2 will typically take between under 2½ minutes to just over 3 minutes. Previously, there was variability between 2½ minutes and up to 5 minutes (in morning peak) with the former signalised intersection.



TIP
See Page 13 of this report for guidance on reading these graphs.



SAFETY

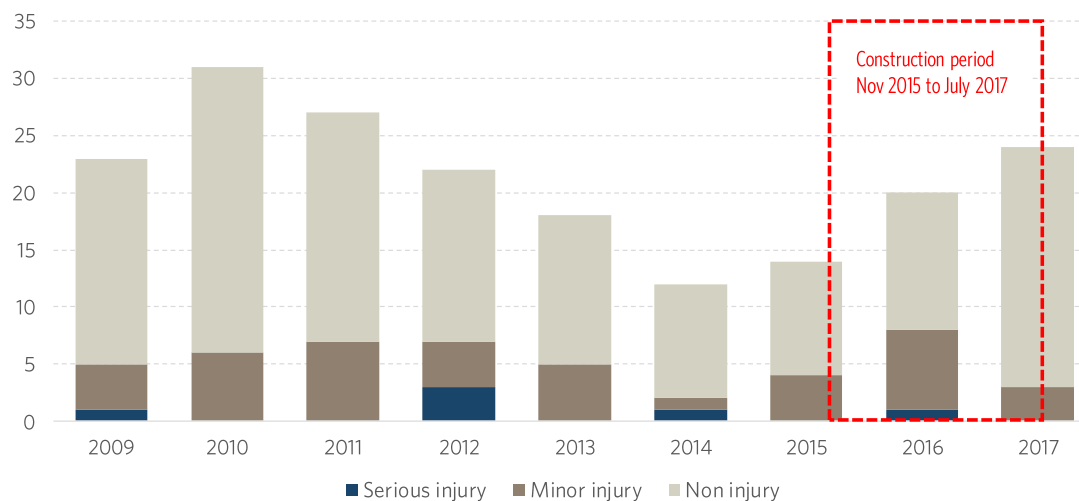
TOO SOON TO CONCLUDE ON SAFETY OUTCOMES

It is too soon since the Haywards Interchange was completed to confirm with sufficient confidence whether safety has improved. At least five years of crash data is generally needed to identify any statistically significant changes in crash rates as the result of a project's interventions.

Crash history at the project location (Figure 13) suggests a downward trend in crashes between 2010 and 2014 has been followed by an upward trend. However, caution is needed with concluding this. Year-on-year changes in crash rates partly reflect random fluctuations in crash incidence caused by factors other than the road design.

Crashes at and next to the Interchange since it was completed in August 2017 have all been minor injury or non-injury in nature — see Snapshot at right.

Figure 13: crashes by severity at Haywards Intersection/Interchange and immediate vicinity



SNAPSHOT:

CRASHES SINCE INTERCHANGE OPENED

August 2017 to March 2018*

9 recorded crashes: 2 minor injury, 7 non-injury

Crash types:



3x rear end/obstruction



2x lost control on straight road

1x lost control on bend



2x overtaking crashes



1x pedestrian crash

* There can be a lag of up to 3 months for all crash records to be entered in the Crash Analysis System (CAS).

Source: NZ Transport Agency: Crash Analysis System (CAS).

MULTI-MODAL INFRASTRUCTURE

WALKING, CYCLING, AND PUBLIC TRANSPORT SUPPORTED



Bike paths on both sides of the interchange enable cyclists to use SH2 without having to cross in front of other traffic using the highway.

This is a safer and preferable design than has been used nearby on other parts of SH2, where cyclists have to cross highway on/off ramps in a high speed environment.



A shared pedestrian/bike path separated from the dedicated bike path in subways is also provided linking to a Park & Ride carpark and footbridge to Manor Park train station and suburb.



A Park & Ride carpark with 44 spaces has been provided. Unlike other regional Park & Rides, this carpark does not currently get full. The carpark was only about 1/3rd full during site visits for this review. This may be because it is less accessible from Hutt Valley suburbs than other Park & Rides.



A pedestrian bridge constructed as part of the interchange project links the Park & Ride carpark to Manor Park train station and suburb.



PROJECT CONSTRUCTION TIMEFRAME AND COST

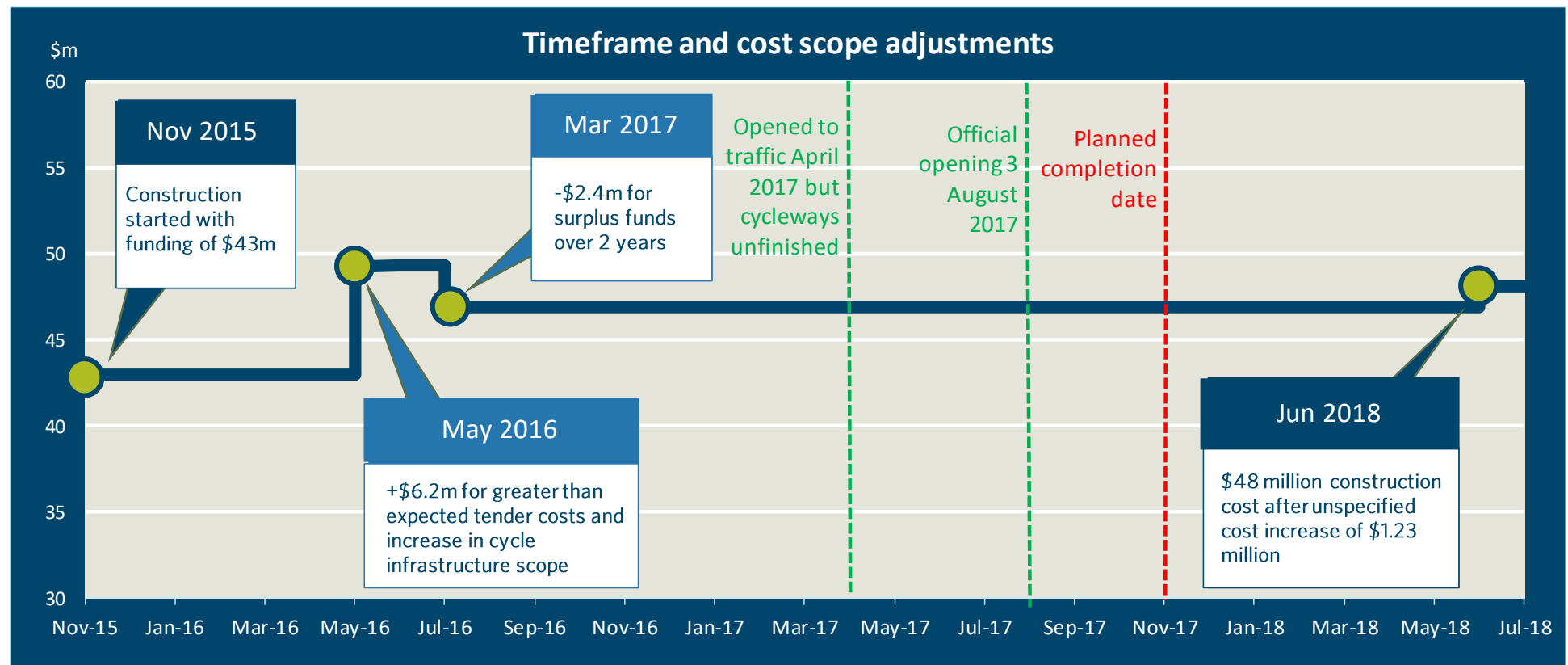
INTERCHANGE OPENED TO TRAFFIC EARLY BUT COST MORE THAN BUDGETED TO BUILD

Interchange constructed for **\$48 million**

11.6% above budget mainly because of higher tender costs and increased scope for cycle path facilities.

Interchange completed early-August 2017

3 months earlier than originally signalled in public newsletters.



GUIDANCE

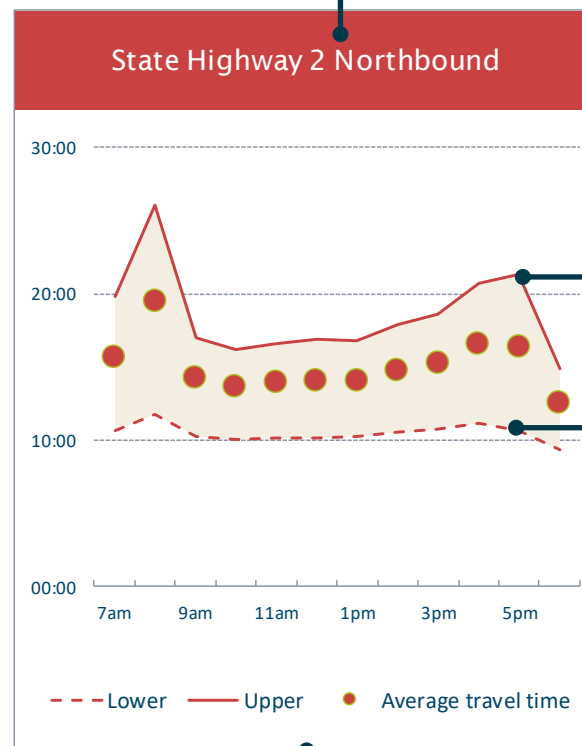
UNDERSTANDING THE TRAVEL TIME & RELIABILITY CHARTS

This page explains the travel time and reliability charts used in this report.

Results presented are averages over a month.
Weekdays are used in this report with holidays excluded.

Travel times vary during different times of the day

- Charts show typical travel times observed each hour between 7am and 7pm.
- Peak periods in the morning and late afternoon are common in urban areas, when commuter traffic volumes and congestion are greatest.
- Inter-peak traffic (travelling between around 9am and 4pm) generally faces shorter travel times and less journey time variability.



The wider this range, the less journey time reliability

- The majority of vehicles covering the route at this time of day travelled within this time range.
- A project which narrows this range successfully improves journey time reliability.
- Improved reliability means people can better predict their travel times because of less variability.

Source: All travel time data presented in this report was sourced from TomTom Traffic Stats