

## **ENCOURAGING TAXI DRIVERS TO BEHAVE: GRAFTON BRIDGE TAXI AND BUS LANE TRIAL**

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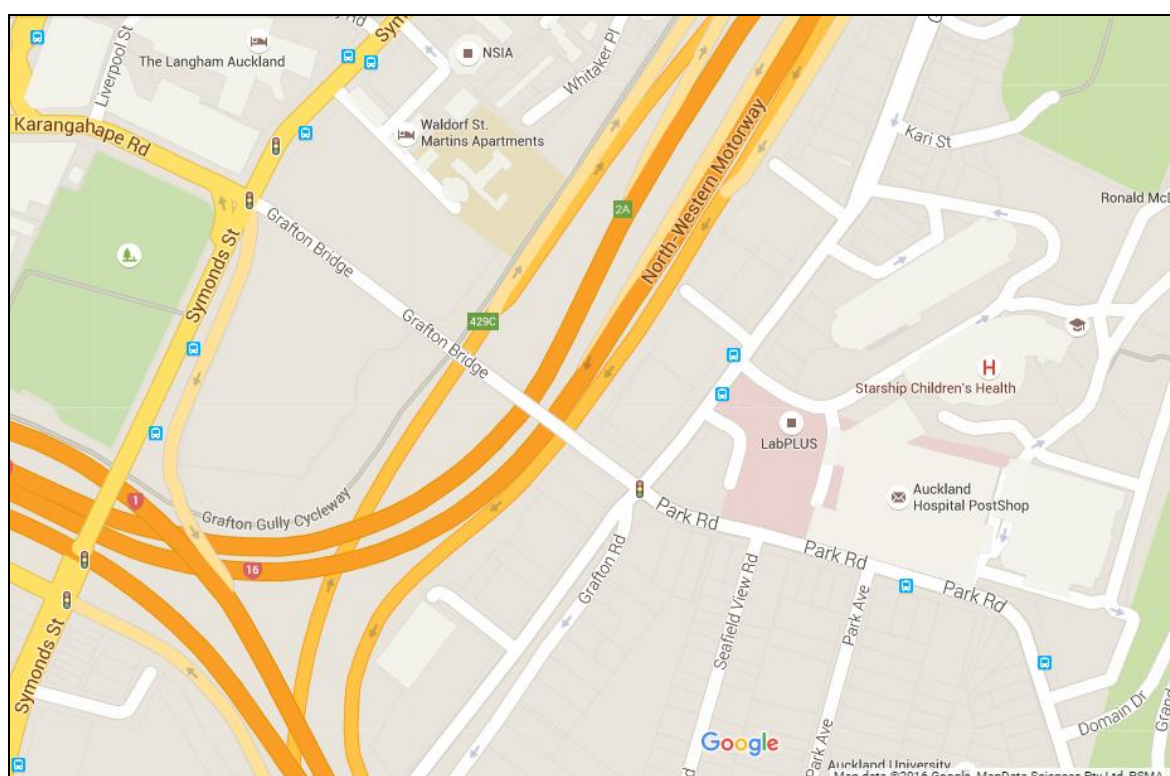
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## **ABSTRACT**

Auckland Transport has implemented a trial allowing taxis 24 hour access to Grafton Bridge to determine whether their presence will adversely affect other users of the bridge. Prior to the trial Grafton Bridge was restricted to bus lane users only between 7:00am and 7:00pm. Allowing taxis to use Grafton Bridge improves access for taxi passengers travelling to or from Auckland City Hospital and Starship Children's Hospital. In order to allow taxis to use the bridge the bus lanes were converted to 'bus and taxi' lanes with the corresponding updates made to signage and road markings. Auckland Transport set a series of monitoring conditions to determine the success of the trial and stipulated some specific thresholds for safety and general operation which, if breached would result in stopping the trial. The results of the first quarter monitoring indicate that allowing taxis on the bridge does not affect cyclist numbers or bus performance. Taxi drivers however have repeatedly breached the conditions of the trial by exceeding the speed limit and by overtaking cyclists on the bridge which could result in the trial being stopped after three months of operation.

## INTRODUCTION

Grafton Bridge is a two lane bridge in central Auckland spanning Grafton Gully from Symonds St in the west to Grafton Road in the east. It is a heavily used bus and cyclist route. To improve bus services on a key public transport route, part time bus lanes were installed on Grafton Bridge in 2009. These bus lanes operated between 7am and 7pm, Monday to Friday and during their hours of operation the bridge was closed to all traffic except buses, cyclists, motorcyclists and emergency services. Footpaths on both sides allow pedestrian access at all times. At other times the bridge was open to general traffic.



**Figure 1.** Grafton Bridge location map

Because of the proximity of Grafton Bridge to Auckland City Hospital and Starship Children's Hospital, both high demand destinations for passengers, Auckland Transport (AT) initiated a trial on 2 September 2015 allowing taxis 24 hour access to the bridge. The trial was supported by the Taxi Federation who provided input into the development of the trial.

## IMPLEMENTATION

Several potential risks were identified with the trial including a reduction in cyclist safety and an increase in bus travel times. These risks were further reinforced during consultation with key stakeholders. Concern for cyclist safety was raised by Cycle Action Auckland and the Waitemata Local Board. It was considered that the introduction of taxis to the bridge would decrease the safety of the bridge and discourage cyclists from using this route. As a result strict taxi driver behavioural expectations were set and monitoring metrics were specified.

Grafton Bridge has narrow lanes with double yellow no overtaking lines down the centre line. Taxis overtaking cyclists was identified as a specific concern as this cannot be achieved safely without crossing the centre line. Concern was also raised with taxis following cyclists exerting unreasonable pressure by following too closely. In order to maintain a high level of service and safety for cyclists, expectations were set that taxi drivers should not overtake cyclists and should ensure they give cyclists sufficient space when following. These restrictions were not considered unreasonable as taxis would not be unduly delayed as Grafton Bridge is restricted to 30km/hr, has a relatively short span and is at a flat grade.

In order to allow taxis to use Grafton Bridge, a resolution was passed converting the bus lanes into a new form of special vehicle lane that is available to all the vehicle classes that used the bus lanes and also to taxis. Signage and road markings were updated to show the conversion of the bus lanes to 'bus and taxi' lanes. The physical works associated with the trial were installed on Wednesday 2 September 2015.

## MONITORING

The trial monitoring was designed to assess the impact that taxis have on buses, cycles and motorcycles together with any potential influence on the behaviour of general traffic and pedestrians. The trial would not be adopted on a permanent basis if the introduction of taxis proved to have more than a minor negative impact. The trial was also to be stopped if at any time significant issues with taxis using the special vehicle lane were identified. Monitoring reviews were scheduled to be undertaken every three months and reported on to key stakeholders.

Table 1 outlines the monitoring to be undertaken during the 12-month trial period and the key measures for before and after analysis.

	Monitoring measure	More than minor effect
1	Video analysis of taxi driver behaviour (CCTV and mobile enforcement cameras):	
	<ul style="list-style-type: none"> <li>Setting down and picking up of passengers on the bridge or its approaches.</li> </ul>	Observed rate greater than 0.05/hr (more than 1 instance observed for every 20 hours of monitoring)
	<ul style="list-style-type: none"> <li>Taxis u-turning on bridge</li> </ul>	More than 3 recorded instances of taxis making U-turn manoeuvres on the bridge.
	<ul style="list-style-type: none"> <li>Interaction of taxis with cyclists and motorcyclists.</li> </ul>	More than 3 recorded instances of taxis overtaking cyclists on the bridge; More than 2 recorded instances of cyclists being required to take evasive action because of taxi driver behaviour. More than 3 recorded instances of taxis following too close to cyclists or pressuring them to cycle faster.
	<ul style="list-style-type: none"> <li>Interaction of taxis with buses.</li> </ul>	More than 3 recorded instances of bus drivers being required to take evasive action because of taxi driver behaviour.
2	Travel time analysis of buses between nodes either side of Grafton Bridge. Utilising bus GPS data.	Increase in average bus travel times of 20 seconds or more which can be attributed to the presence of taxis using the bridge.
3	Analysis of queues at Grafton Bridge/Symonds St/Karangahape Rd and Grafton Bridge/Grafton Road/Park Road intersections	During peak times more than 10% of buses do not clear the intersection approaches to Grafton Bridge on one signal phase due to the presence of taxis. During peak times more than 10% of buses are unable to exit Grafton Bridge on one signal phase due to the presence of taxis.
4	Surveys of taxi speeds (30km/hr limit).	85 <sup>th</sup> percentile speed of taxis is greater than 30km/hr 95 <sup>th</sup> percentile speed of taxis is greater than 40km/hr
5	Cyclist numbers before and after.	Cyclists number drop by greater than 10%
6	Analysis of reported crashes on the bridge and the approaches to the bridge.	More than 2 reported crashes involving taxis and buses or vulnerable road users

	Monitoring measure	More than minor effect
7	Bus driver survey.	Feedback to be assessed by trial steering group.
8	Cyclist survey.	Feedback to be assessed by trial steering group.
9	Review of any public feedback submitted during trial. Posters will be displayed at each end of the bridge for pedestrians/cyclists providing details of a web site for feedback.	Feedback to be assessed by trial steering group.
10	Review of any local board feedback during trial.	Feedback to be assessed by trial steering group.
11	Review of general vehicle infringements.	Greater than 75% increase in rate of infringements
12	Review of taxi infringements in bus lanes across Auckland.	Greater than 200% increase in rate of infringements

**Table 1.** Monitoring measures for the Grafton Bridge Trial

If at any time during the trial any of the following situations occurred, the trial was to be stopped and the operation of Grafton Bridge would return to its previous state.

- If any of the individual events resulted in more than a minor effect, see table 1.
- If any of the limits for average measures defining a more than minor effect in table 1 were exceeded in 2 consecutive quarters.
- If any injury crashes were reported involving taxis using Grafton Bridge (unless there were extenuating circumstances).
- If an increase in average bus travel times of 30 seconds or more was observed in a one month period that could be attributed to the presence of taxis using the bridge.
- If an increase of 100% in the rate of general vehicle infringements on the bridge occurred in a one month period.
- If a Steering Group consisting of the Transport Services Manager, the Network Operations and Performance Manager, the PT Infrastructure and Facilities Development Manager and the Travel Demand Manager considered that the presence of taxis on Grafton Bridge was having a major negative impact on other users.

## EDUCATION

Prior to implementing the trial AT invited all Approved Taxi Organisations (ATOs) operating within the Auckland Region to a workshop outlining the monitoring conditions, thresholds to stopping the trial and expected taxi driver behaviour. Information pamphlets were given to all drivers within the ATOs. The key expectations of taxi drivers were:

- Stay back from cyclists so as not to intimidate them
- Do not overtake a cyclist
- Do not exceed the 30km/hr speed limit
- Do not stop to pick up or drop off passengers on the bridge
- Do not make U-turn manoeuvres on the bridge

Several meetings were held with members of the Taxi Federation, key industry representatives and AT officers, where trial conditions and behaviour expectations were further outlined. Feedback regarding the trial was positive and a good level of compliance was anticipated from the major Approved Taxi Organisations.

## POST IMPLEMENTATION REVIEW

The following outlines the mid November first quarter review of monitoring conditions for the trial. The monitoring consisted of site visit observations and review of CCTV camera footage.

CCTV footage was reviewed between 7:00-9:00, 11:00-13:00, 16:00-18:00 on the following days:

- Tuesday 3 November
- Wednesday 4 November
- Thursday 5 November
- Tuesday 10 November

Site visits were undertaken on:

- Thursday 19 November - 10:00 - 12:00
- Thursday 19 November - 15:30 - 18:00
- Monday 23 November - 7:00 - 9:00
- Monday 23 November - 16:00 – 18:00

**Volume of taxis using Grafton Bridge:** Table 2 shows average flows during the four days of CCTV monitoring.

Direction	AM peak (veh/2hrs)	Interpeak (veh/2hrs)	PM Peak (veh/2hrs)	Total peak volume (veh/6hrs)
Toward K' Rd	37	26	32	95
Toward Grafton	20	21	25	65

**Table 2.** Number of taxis using the bridge during peak hours.

**Setting down and picking up passengers:** No setting down or picking up of passengers was observed during the monitoring periods.

**Taxis u-turning on the bridge:** No taxis were observed to U-turn on the bridge during the monitoring periods.

**Interaction of taxis with cyclists and motorcyclists:** On 3 September, the second day of operation, a cyclist reported being passed by a taxi on the bridge which was confirmed through review of CCTV footage. On the 18<sup>th</sup> of September a second infringement was reported and again confirmed via CCTV footage. Following both instances an email was sent to all ATO's informing them of the infringements and reminding them of the potential for the trial to be stopped. Following these warnings no further public notifications were made.

As part of the first quarter monitoring a further 30 taxis were observed to overtake cyclists, see an example of this in Figure 2. This number exceeded the upper limit of 3 set at the beginning of the trial. In at least a quarter of the cases taxis failed to give the NZTA recommended 1.5m clearance when passing a cyclist.

No instances were observed of cyclists needing to take evasive action as a result of taxis passing or undertaking any other manoeuvres. Observations also indicated a high proportion of taxi drivers did stay an appropriate distance back from cyclists. It was also observed during monitoring that buses frequently overtook cyclists on the bridge, see Figure 3.

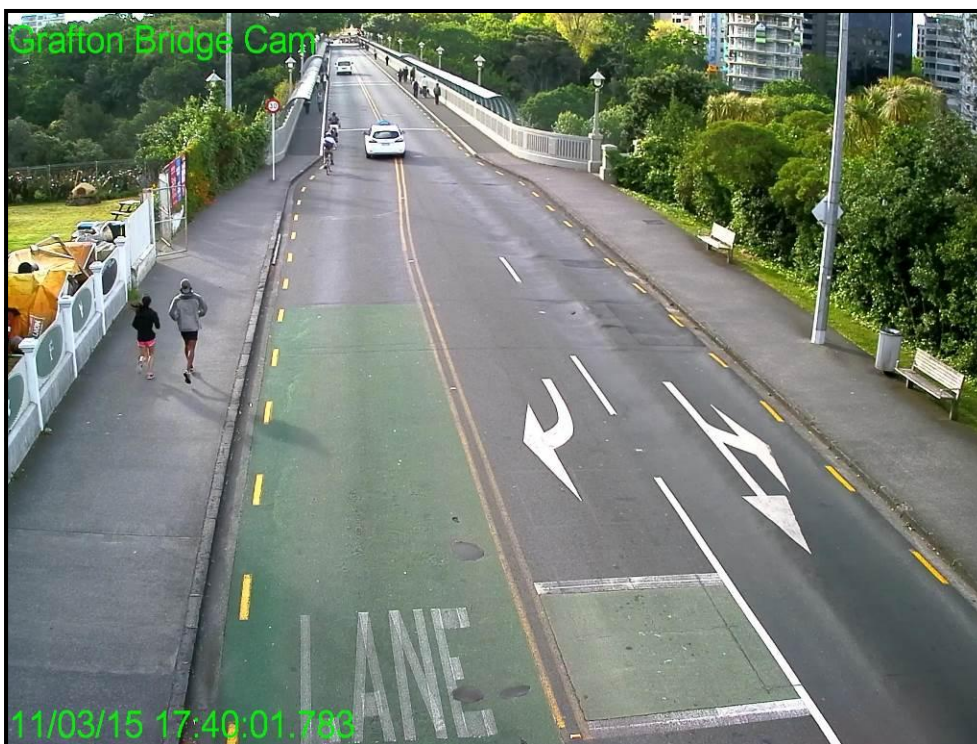


Figure 2. CCTV footage showing a taxi overtaking cyclists on Grafton Bridge



Figure 3. CCTV footage showing a bus overtaking cyclists on Grafton Bridge

**Interaction of taxis with buses:** No instances were observed where bus drivers were required to take evasive action as a result of taxi driver behaviour.

**Bus travel time analysis:** Bus travel times between bus stops on either side of the bridge were similar in September/October when compared to July/August. The only instance where travel times worsened after the implementation of the trial was for westbound traffic in the AM peak between Park Road and Karangahape Road. This average travel time increased by 2 seconds or 1.4%. This increase falls within the acceptable level.

	Weekday average bus travel times between Park Rd and Symonds St*			Weekday average bus travel times between Park Rd and K' Rd*		
	July/Aug average (s)	Sept/Oct average (s)	Change (s)	July/Aug average (s)	Sept/Oct average (s)	Change (s)
<b>AM Peak 7:00-9:00</b>						
Eastbound	178.5	175.5	-3	123.5	117.5	-6
Westbound	174	164.5	-9.5	147.5	149.5	+2
<b>Interpeak 9:00-15:30</b>						
Eastbound	168	162	-6	115.5	113.5	-2
Westbound	154	150	-4	138.5	133.5	-5
<b>PM Peak 15:30-18:30</b>						
Eastbound	240.5	215	-25.5	168.5	147.5	-21
Westbound	173.5	159.5	-14	158.5	149.5	-9

\*All dwell times are excluded in the analysis.

**Table 3.** Change in weekday average bus travel times following trial implementation

**Analysis of queues at Grafton Bridge:** Taxis were not observed to contribute to queue lengths at either the Park Road or Symonds Street intersection. There were no observed instances where the presence of taxis resulted in buses failing to progress on a green phase.

**Taxi speeds:** Samples of mid-bridge speeds were measured using a speed gun over three site visits. Only taxis unimpeded by other users were measured. Due to low taxi volumes and the presence of other users on the bridge only a small sample of speeds was able to be collected. The 85<sup>th</sup> percentile speed of taxis was 44.3km/h. The 85<sup>th</sup> percentile speed of taxis is higher than the 30km/hr limit set at the beginning of the trial.

Vehicle	85 <sup>th</sup> percentile speed (km/h)	Sample size
Taxi	44.3	57

**Table 4.** 85<sup>th</sup> Percentile speeds of taxis travelling on Grafton Bridge

**Cyclist numbers:** Cyclist numbers are counted by an automatic counter on Grafton Bridge. The numbers of cyclists in September and October were higher than in the same months in previous years. When taken as a percentage of the year's total (excluding November and December) the number of cyclists in September and October is very similar to previous years. It does not therefore appear that the trial has had an effect on the number of cyclists using Grafton Bridge.

	2013		2014		2015	
	No of cyclists	% of Jan-Oct total	No of cyclists	% of Jan-Oct total	No of cyclists	% of Jan-Oct total
September	12649	8.8	12072	8.8	12905	8.9
October	16017	11.1	14115	10.3	16083	11.1
Jan-Oct	143901		137422		145393	

**Table 5.** Cyclist trips on Grafton Bridge over the last three years.



**Crashes on Grafton Bridge:** There have been no reported crashes on Grafton Bridge involving taxis.

**General vehicle infringements:** An increase in the incidence of general vehicles illegally using Grafton Bridge during the operating hours of the special vehicle lane was seen when monitoring CCTV footage. Rates of infringement before the trial were measured using two days of CCTV footage. Rates of infringement after the trial were measured using 4 days of CCTV footage. The overall increase in the rate of infringements falls within the allowable range.

	Average rate of infringement before the trial (infringements/hr)	Average rate of infringements during the trial (infringements/hr)	Increase in rate of infringements (%)
AM peak	2.25	1.63	-27.5
Interpeak	3.5	8.38	139.4
PM peak	9.25	6.25	-32.4
Total	5	5.42	8.4

**Table 6.** Change in average rates of general vehicle infringements.

## CONCLUSIONS

The presence of taxis did not appear to have a significant negative effect on the operation of Grafton Bridge in terms of reducing cyclist numbers or affecting bus travel times. This was likely to be due to the number of taxis using the bridge during peak times was limited.

Despite a focus on educating Approved Taxi Organisations and their drivers, the monitoring highlighted a widespread failure to adhere to the speed limit on the bridge and the requirement not to overtake cyclists on the bridge. This is concerning as during the trial taxi drivers should have been receiving significant pressure from their management to adhere to the conditions of the trial. If the trial was adopted on a permanent basis it would be expected that driver behaviour would deteriorate further.

The actual effect of taxi driver failures on safety is difficult to quantify especially when a large number of buses also fail to maintain the 30km/h speed limit and regularly overtake cyclists; however a clear objective of the trial was that the presence of taxis would not decrease safety or the perception of safety for the large number of cyclists using the bridge. Based on this assessment it has been recommended that the trial be stopped and Grafton Bridge be returned to its previous operation as a bus lane between the hours of 7:00am and 7:00pm.

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