MEASUREMENT OF DRINK DRIVING ON THE AUCKLAND ROAD NETWORK — EXECUTIVE SUMMARY

Auckland Transport (AT) has a Safe System approach to road safety. According to the New Zealand Transport Agency (NZTA).

A Safe System recognises that people make mistakes and are vulnerable in a crash. It reduces the price paid for a mistake, so crashes don't result in loss of life or limb.

Such measures include reducing speeds so that impacts do not produce serious injury or death, reducing the aggressivity of the road environment through measures like crash barriers and making vehicles more crashworthy and less aggressive towards vulnerable road users.

A Safe System approach also seeks to reduce the level of mistakes made by drivers by taking measures to reduce the likelihood of such mistakes. These may be infrastructural measures which reduce the complexity of the road system like removing out of context curves or measures to directly improve driver performance like reducing the amount of alcohol or drug impaired driving,

An integral part of this approach is being able to measure potentially dangerous road user behaviours on the network. If such behaviours are not measured, it becomes more difficult to assess the impact of countermeasures. One of these dangerous behaviours is drink driving,

Drink driving related crashes are an important contributor to road crashes. Of the 545 fatal and serious crashes in Auckland in FY20/21 , 70 (13%) involved drivers who tested over the limit or refused a test. Weekends feature particularly high levels of drink driving. The periods 10pm to 2am from Friday night to Sunday morning are commonly called the high drinking hours and drink driving rates during these hours are used by NZTA to monitor drink driving.

Law breaking is inversely related to the perceived certainty, severity and swiftness of apprehension and punishment. To reduce alcohol offending we must increase the above perception. This is called deterrence. Deterrence takes two forms:

- **General deterrence —** impact of enforcement on those not directly affected by the enforcement, like those who hear about a campaign by word of mouth, observing enforcement, through public education campaigns, the media, etc.

- **Specific deterrence —** impact on those directly affected and including drivers who have been tested at a checkpoint or by an officer on patrol, their passengers and those who go past a checkpoint without being tested.

To be successful we need to aim at impacting everyone. Therefore, general deterrence is a crucial component of alcohol enforcement. The major method used to deter people from drink driving is Police Compulsory Breath Testing (CBT) checkpoints, aimed at general deterrence supplemented by specific deterrence gained by Police patrols breath testing drivers suspected of drink driving. This needs to be accompanied by far reaching, targeted, support publicity.

To optimise their operations, it is important to provide the Police with regular information on drink driving on the road network. This may be done using downloaded breath testing data from Police breath testing machines. These machines provide test results, the grid reference to the test site, and the date and time of the test. The grid reference of the test site may be matched to road network data to tell us where on the road network the test occurred.

This allows a weighted average proportion of positive tests by One Network Road Classification (ONRC) road type to be produced for the relevant time period. The weighting is done using the proportion of total VKT in the time period for each road type. The sum is done over all road types.

Weighted average = ∑ (Number of positive tests / Total number of tests) x (Road type VKT / Total VKT)

Averages are computed for the high drinking hours from Friday night to Sunday morning. Three sub-periods periods (10pm to midnight, midnight to 1am: and 1am to 2am) are used because they have previously been shown by NZTA to have different drink driving propensities. Once computed, these averages are combined into a grand mean for the high alcohol period. This is done by weighting each by the VKT in its period divided by the VKT between 20:00 and 02:00 and summing the results.

Grand Mean = ∑ (Number of positive tests / Total number of tests) x (Road type VKT) / Total VKT 22:00-02:00)

This method provides drink driving estimates which account for the network traffic where Police are carrying out testing. It can also provide results by ONRC road type which may assist Police in planning their breath testing tactics. The table below depicts Auckland percentages of drivers with positive breath alcohol readings over 250 mcg/L, under 250 mcg/L, between 250–400 mcg/L, and over 400 mcg/L by time period.

Percent over 250 mcg/L (incl. over 400)		Percent under 250 mcg/L		Percent between 250–400 mcg/L		Percent over 400 mcg/L	
FY 20/21	FY 21/22	FY 20/21	FY 21/22	FY 20/21	FY 21/22	FY 20/21	FY 21/22
10 PM–MIDNIGHT, FRIDAY & SATURDAY							
1.9%	2.4%	3.3%	3.1%	0.8%	0.8%	1.1%	1.6%
MIDNIGHT–1 AM, SATURDAY & SUNDAY MORNING							
4.4%	3.7%	3.2%	2.9%	1.5%	1.3%	2.9%	2.4%
1 AM–2 AM, SATURDAY & SUNDAY MORNING							
11.3%	7.6%	5.6%	4.7%	2.6%	1.9%	8.7%	5.7%
GRAND MEANS COVERING ALL 3 TIME PERIODS							
3.8%	3.4%	3.6%	3.3%	1.2%	1.1%	2.6%	2.3%

The above table and more detailed analyses by road type result in the following conclusions

- Overall, there is an encouraging improvement in the over 250mcg/L and the over 400mcg/L percentages between 2020/21 and 2021/22, Future measurements will determine how enduring this improvement proves.

- Access roads and secondary collectors comprise around 2% of VKT but produce 14.7% of those over 250 mcg/L and 16.4% of those over 400 mcg/L during the weekend high alcohol hours (for 2021/22).

- During the weekend high alcohol hours, the drink driving percentage increases between 10pm and 2am during a time of decreasing VKT. In FY 2020/21 the percentage over 250 mcg/L between 1am and 2am was 7.6%, with 5.7% over 400 mcg/L.

- The number of drivers exceeding the limit means that there is considerable scope to improve road safety by reducing drink driving.