

Out of scope

2

## 6.7 Road Traffic Reduction Benefits

Decongestion benefits are expected to be a significant proportion of the overall project benefits, as the proposed facility would provide an alternative to private car travel on currently congested road corridors, including the Northern Motorway, Onewa Road and Esmonde Road. As a result, any mode shift in favour of active modes will reduce existing (or forecast future) congestion on the road network.

The default EEM decongestion value for Auckland is \$1.89 per vehicle-km removed from the network (Table SP9.1, updated to 2017 values). This flat value does not however recognise the high levels of congestion currently experienced on the Northern Motorway and its approaches during the commuter peak periods, and does not reflect how this congestion is expected to change over time.

The evaluation has instead used the Northern Corridor Improvements (NCI) SATURN models to quantify the benefits of each cross-harbour car trip removed from the road network. These models have recently been updated to reflect Council's latest I11 land use forecasts, so are consistent with the land use assumptions used to generate the cycle demand forecasts.

To quantify these benefits per vehicle-km, a small number of cross-harbour vehicle trips<sup>37</sup> have been removed from the morning peak, evening peak and interpeak period NCI SATURN models. The NCI model runs with and without these trips have then been compared, and standard economic evaluation

<sup>37</sup> Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives; Transport for New South Wales; June 2018

<sup>38</sup> Cross harbour trips between Northcote/Takapuna and the CBD/Inner west have been removed only.

methodologies have been used to quantify the vehicle travel time, congestion and operating cost benefits per peak period, with cross-harbour vehicle trips removed from the network.

This process has resulted in the following decongestion values, which have been applied to the economics:

### 2026 Decongestion Rates

- ◆ \$4.85 per vehicle-km removed from the road network during the commuter peaks
- ◆ \$1.38 per vehicle-km during the weekday interpeak period

### 2036 and 2046 Decongestion Rates

- ◆ \$7.10 per vehicle-km removed from the road network during the commuter peaks
- ◆ \$1.48 per vehicle-km during the weekday interpeak period

The values derived above are higher than the EEM's default rate of \$1.89 per vehicle-km removed from the road network, and reflect that the proposed facility would remove vehicle trips from an area of the network that is significantly more congested than the Auckland average.

Weekend and off-peak decongestion values have conservatively been assumed to be zero, and no growth has been applied to these values beyond 2036. This reflects the conflicting factors of increasing land use and traffic volumes, but the decongestion expected following construction of the Additional Waitemata Harbour Crossing (potentially in approximately 2041).

It is noted that no I11 2046 NCI SATURN model is available at this time.

Forecasts of new commuter peak cycle trips have been obtained directly from the ACM, with daily cyclist count profiles obtained from Tamaki Drive used to develop estimates of new interpeak cycle trips. Estimates of new pedestrian trips have been developed based on the earlier assumption that 50% of the proposed facility's forecast daily pedestrian trips will be new trips, with commuter peak and interpeak proportions based on pedestrian profiles obtained from Tamaki Drive.

It is important to recognise that not every new cross-harbour active mode trip on the proposed facility would otherwise take place by private car. Recognising this, the number of new active mode trips has been factored down to reflect:

- ◆ Car mode share across the Auckland Harbour Bridge (57% in the commuter peaks in 2026 and 51% in 2046, 77% in the 2026 interpeak and 70% in 2046, from the Auckland Regional Transport model),
- ◆ Average car occupancy (1.30 during the commuter peaks and 1.25 during the interpeak, from the Auckland Regional Transport model),
- ◆ Non-utility cycling trips – some new cross-harbour trips will be recreational trips and therefore not replacing a trip by any other mode. 70% of new cycle trips are estimated to be utility trips during the commuter peaks, and 15% during the interpeak period, based on survey data collected on Quay Street and Tamaki Drive.

2

It is noted that car mode share may not directly correspond to car diversion, as public transport users may be more willing to change mode to cycling than car users. This would particularly be the case for users who do not have access to a vehicle. The 2013 Census data however indicates that only 5% of households within the Devonport-Takapuna and Kaipatiki Local Board areas did not have access to a car. Nonetheless, this suggests that an additional factor may be necessary, to account for this bias.

Conversely however, we consider that car/public transport diversion is also corridor specific, and will vary depending on the respective levels of service offered for each mode. In the case of the Auckland Harbour Bridge and its approaches, existing level of service by car is very poor, with significant queues and delays for car users during the commuter peak periods. Levels of service for bus users however are relatively good, with bus or transit lanes on the key arterial corridors that supply the Northern Motorway (Onewa Road, Esmonde Road and Akoranga Drive on the North Shore, and Fanshawe Street in the city centre), and bus priority through interchanges.

The two factors above offset each other to some degree, but it is not possible to quantify to what extent. As a result, the car diversion rates applied to the economic evaluation have been developed based on car mode shares, as documented below.

The car diversion rates applied to new cycle trips in the economic evaluation range from 0.09 to 0.31 as set out below, in the 2026 interpeak and commuter peaks, respectively:

- ◆ 2026 interpeak: 15% utility trips x 77% car mode share / 1.25 car occupancy = 0.09
- ◆ 2026 commuter peak: 70% utility trips x 57% car mode share / 1.3 car occupancy = 0.31

Lower car diversion rates were applied in subsequent forecast years, to reflect the reduced car mode share across the Auckland Harbour Bridge predicted by the regional macro simulation model (MSM).

As a result, decongestion benefits have been calculated using the following process:

**Equation 4: Annual Commuter Peak Period Decongestion Benefits (Cyclists), 2026**

8.9 km average new cycle trip length	x	797 new peak period utility/ recreational cycle trips, from ACM	x	0.31 diversion rate	x	\$4.85 benefit rate	x	245 weekdays/ year	=	\$2.61 million
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The above process has been repeated for the interpeak period, for pedestrians (assuming a shorter, 1.3 km average trip length), and for the other forecast years. The resulting general traffic decongestion benefits have been estimated to be \$54.8 million, discounted over the 40-year evaluation period.

Sensitivity testing has been carried out on the economic evaluation to assess the effects of higher and lower car diversion rates.

2