Memo

From: Auckland Light Rail Group

Date: May 2022

Re: City Centre Network Integration

1. Introduction

In January 2022, the Government announced Tunnelled Light Rail as the selected option for the Auckland Light Rail City Centre to Māngere line (CC2M).

Considering the mode options and associated trade offs, outlined in the Indicative Business Case, tunnelled light rail has been selected because it holds the best opportunity to achieve the Government's desired outcomes to benefit Auckland.

The option:

- Is a high capacity future proofed transport solution that improves travel time and reliability.
- It enables a more flexible route and unlocks significant urban benefit within the corridor.
- It sets the stage for future network integration – including a new harbour crossing and light rail to the North Shore.
- It avoids overwhelming Queen Street and minimises the extent of construction disruption.

Demand profiles are highest in the city and isthmus. When additional light rail lines to the North Shore and North West converge in the city centre, there will be an increase of customers through the city and connecting to the CC2M line. Tunnelled light rail has the capacity to move 15,000 people an hour at peak and would reach total network capacity in 2070. This is needed as the Northern Busway is growing by 20 percent a year and will run out of capacity in 10-15 years.

2. Purpose

The purpose of this technical note is to support an evidenced based conversation on integration of CC2M, with the future rapid transit network connections to the North Shore and North West.

In conjunction with the submission of the Indicative Business Case to project Sponsors, work was carried out by the Auckland Light Rail Group to address key queries related to mode options within the city centre.

The assessment was undertaken by a group of subject matter experts from Waka Kotahi, Auckland Transport, Auckland Council and consulting specialists from the project team. It is important to note that this work focused on the feasibility of options and not identifying recommended options.

3. Summary of Findings

The following answers to key queries have been identified and summarised below:

Question 1 - Could the combined North Shore, North West and CC2M passenger demand through the city centre be met by using surface light rail?

No. This was considered in two parts, could a single light rail line accommodate the combined demand, and secondly, could the central city cope with two light rail lines.

Whilst physically possible to provide a second surface route in the central city, the operational constraints and unacceptable impacts on the wider transport network mean the theoretical capacity of a second route cannot be realised, and future demand not met.

The Indicative Business Case identified a surface light rail option with sufficient capacity for forecast demand generated within the corridor.

Light rail demand within the city centre is forecast to increase significantly (+68%) when the corridor expands to the North Shore and the North West. To meet the network demands, the length of each light rail train requires a 24m increase in length (from 66m to 90m). Headways on the approaching lines (North West and CC2M) also needs to increase, to one train every three minutes during the peak periods.

Combining the two lines (North Shore and North West) with CC2M through the city centre results in a 90m long train every 90 seconds. This high frequency creates bottlenecks within the corridor that could delay light rail vehicles by up to 25 minutes, as it travels between midtown and Wynyard Quarter, whilst also accommodating pedestrians and city centre buses. This level of delay reduces the effective peak period capacity by 48%.

Therefore it was concluded that network expansion through a single surface line within the city centre is not viable, as it will not meet key customer and capacity outcomes.

Question 2 - Does a city centre tunnel have flexibility to connect to either a future tunnel or bridge option, to cross the Waitematā Harbour?

Yes. A tunnelled light rail route through the city centre is compatible with either a future tunnel or bridge crossing of the Waitematā Harbour in the future.

Until the exact route of an option is known, it is difficult to provide an exact design interface with a future Waitematā Harbour crossing (that's form is yet to be confirmed). However sufficient analysis was able to be carried out, to give confidence that there is an engineering solution that makes it possible to link the project (whether at the surface, or in a tunnel) with either a new tunnel or a bridge across the harbour.

Question 3 - What are the costs, capacity, benefits and operational implications for a shorter tunnel from Wynyard Quarter to Dominion Junction?

A shorter tunnel would cost $1.9B less than the tunnelled light rail option. Capacity would be reduced by 50% and economic benefits would reduce by $2.4B. The shorter tunnel option does not perform as well as the tunnelled light rail option, from an outcomes or economic justification perspective. This is due to reduced capacity through the city centre because of operational constraints in the central isthmus section from surface light rail.

Conclusion

The Auckland Light Rail Group analysis on these key questions reinforces the key rationale for the tunnelled light rail option in relation to city centre network integration, capacity and benefits.

Tunnelling provides future network integration benefits and cost savings. Without tunnelling, it would be difficult to connect up future lines and enable a seamless connection to the North Shore and North West.