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Road Network Optimisation Update

Recommendation

That the Board:

i. Notes this update

Executive summary

1. Congestion in Auckland has grown by approximately 30% over the past 10 years (2-3% per year). Road Network Optimisation is a relatively inexpensive, quick and effective way to mitigate the effects of congestion. It is a series of multi-modal low-cost interventions that maximises use of the existing network through, for example, small physical interventions such as road realignments, to create extra road capacity.
2. The Network Optimisation Programme is currently enabled by the Regional Fuel Tax (RFT) and aligns closely with the strategic objectives of the Government Policy Statement (GPS) and the Auckland Plan and, is identified as a key intervention in the Auckland Transport Alignment Project (ATAP).
3. Auckland Transport (AT) has a well-established programme that has been progressively introduced since 2010. Given the success of the optimisation programme and current ATAP commitment, we are currently working in partnership with the New Zealand Transport Agency (NZTA) to scale up and accelerate “One Network Optimisation” over the next decade.
4. The programme uses insights gained from regular network performance monitoring and customer feedback to identify points of significant congestion which are investigated, and solutions implemented to improve performance and customer experience.
5. On average individual projects within the programme have delivered a return of $4 to $10 for every dollar invested.

Strategic context

6. Making best use of existing networks is one of the three key components of ATAP, which states that there is potential for substantial gains to be achieved through increased investment in network optimisation. The report also recommends a much greater focus on these projects be considered, as they can be implemented quickly and have a high return on investment.

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7. The Statement of Intent (SOI) commits AT to progress a programme of small to medium scale projects to improve traffic flow around the region. Optimisation directly contributes to the peak period lane productivity across 30 monitored arterial routes and the freight network level of service key performance measures in the SOI.

Background

8. The Auckland plan predicts Auckland will be home to an additional 720,000 people which means an additional 313,000 dwellings and 263,000 jobs will be required over the next 30 years.
9. Auckland's roads are at times busy, complex and often competing multi-modal network with levels of congestion increasing at 2-3% per year. The opening of the Waterview Tunnel two years ago has been key to holding those levels.
10. Current performance of the local roading network:
    - 39% of the bus network is congested during the morning peak
    - 70% of the pedestrian network is operating below desired level of service (LOS)
    - 24% of the general traffic network is congested in the morning peak (increasing to 33% in March – "March Madness" when tertiary institutions, in particular, open for the year).
    - 7% of the network is congested during inter-peak when freight operates the most.
11. The network optimisation model (Attachment 1) focusses on increased people and goods movement capacity –rather than solely vehicle movements.
12. The road network optimisation model uses three main levers to manage congestion in the short/medium term - network management (including routine traffic signal optimisation and active monitoring undertaken by Auckland Transport Operations Centre), capacity creation (repurpose existing road space) and behaviour change (e.g. communicating better performance of special vehicle lanes over general traffic lanes in real time to induce mode shift).
13. Road network optimisation interventions are typically low to medium cost, and any physical changes made would largely be confined within the existing carriageway. There is often the opportunity to introduce a low-scale intervention prior to the introduction of a larger-scale high-cost project where financially viable, to ease significant customer pain-points in the interim. For example, annually approximately 350 traffic signals are reviewed and optimised. All traffic signals are reviewed and optimised at least once every three years, with signals on arterials every two years and in the city centre every year. This financial year, there are 12 projects planned for construction and a further six planned for detailed design this year with a $8.2 million capital expenditure budget. (Attachment2).
14. Redoubt Road Dynamic Lane is one of the key optimisation projects that will be constructed this year which will improve bus and vehicle efficiency.

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15. AT is working closely with the NZTA to document a Programme Business Case to scale up optimisation which will require Board approval.
16. AT has been applying the optimisation model for the last five years, and the Capital Expenditure budget has increased to $8.2 million this year.
17. A recent report by the Automobile Association states that congestion in Auckland has increased, especially on the motorways. The report largely focusses on a single mode. Optimisation increases the productivity of the road space by focusing on people and goods movement not on a particular mode.

Benefits achieved through Optimisation

18. Benefits of optimisation can be seen through a number of recent projects:

- The Whangaparaoa Dynamic Lane project achieved a 58% increase in people movement efficiency with an annual saving of 83,500 hours and a reduction in 845 tons of CO2 emissions. This was achieved despite the speed limit being reduced from 60kph to 50kph. Many customers complimented AT for implementing this project (See Attachment 3).
- The clearway lane on Manukau and Pah Roads was changed to a T3 lane. Immediate benefits saw an average 14-minute journey time saving for bus and T3 lane users. The changes also saw 20% more people travelling along the corridor, in approximately the same number of vehicles as previously. A localised promotional campaign in the surrounding area saw just over 100 people become regular bus commuters.
- Queen Street in the Central City has many more pedestrians than vehicles and therefore it is important to prioritise this mode. Optimising this corridor for pedestrians was achieved by decreasing the cycle time of the traffic signals which in turn reduced pedestrian wait time from over 60 seconds to the current average wait time of 35 seconds.

External Consultation/Engagement

19. AT is working with the Transport Agency to develop a joint Programme Business Case (PBC) with the following aims:

- Demonstrate a true “One Network Approach” between the two agencies
- Further embed a single Network Operating Plan for Auckland
- Improved network performance monitoring and reporting
- Increased funding for optimisation interventions - operational and capital expenditure
- Deliver demonstrator projects.

20. The PBC will be presented to the AT Board for consideration in the coming months.

21. Examples of demonstrator projects include:
    - Review of ramp signals strategy, policy and operations led by the Transport Agency
    - Bus shoulder running on motorways led by the Transport Agency
    - Freight and pedestrian improvements at the SH1/Mt Wellington interchange led by AT
    - Newmarket town centre optimisation, as a result of the new Westfield mall opening in particular, led by AT.

Issues and Options

22. Documenting a joint PBC has resulted in closer alignment of views and direction on how to optimise the Auckland network at an operational level which supports the objectives of ATAP.
23. Improving and broadening data sources and analytical tools will enrich AT's understanding of how the network is performing from a multi-modal perspective, with automated reports to save time, deeper analysis to provide quality insights and more data to identify deficiencies. This is an important objective for building on the gains of optimisation going forward.

Next steps

24. Seek Board approval for the PBC.
25. Deliver the optimisation projects planned for this year.
26. Improve data sources, improve quality of insights and automate performance reporting in 2019/2020.
27. Document the benefits realised of recent Optimisation projects.

Attachments

Attachment Number	Description
1	The Network Optimisation Model
2	Optimisation Capital Expenditure Projects 2019/2020

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3	Customer Feedback on the Whangaparaoa Dynamic Lane Project

Document ownership

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Glossary

Acronym	Description
RFT	Regional Fuel Tax
GPS	Government Position Statement
ATAP	Auckland Transport Alignment Project
NLTP	The National Land Transport Programme
SOI	Statement of Intent
NOP	Network Operating Plan
RLTP	Regional Land Transport Plan
PBC	Programme Business Case
ATOC	Auckland Transport Operations Centre
LOS	Level of Service