

The Congestion Question Report

Review by Engineering New Zealand Transportation Group

19 May 2021

The Transportation Group welcomes the opportunity to provide input on The Congestion Question Report¹. The Transportation Group is a Technical Interest Group of Engineering New Zealand, with over 1,100 members. The Group was formerly known as the IPENZ Transportation Group. More information about the Transportation Group is [available online](#). Please note that this submission has been prepared by a special subcommittee established to prepare this submission which was then opened for feedback from the entire membership. Once the comments from members were also incorporated, it has been approved by the chair and vice chair of the national committee. We acknowledge that not all our members will share the views expressed in this submission, but we believe the majority will.

Our recommendations are formatted in green highlight

Questions are formatted in yellow highlight

Part one – the case for change

In this report, congestion pricing is method used to improve the overall performance of the transport network. While charging for space on the road is a step in the right direction, reviewing this study again with strategic lens is critical. For example, the performance of options is being measured using vehicle Level of Service (LOS) which is a function of vehicular delay. This metric is measure of car travel and freight, but not other modes. This is a short-term vision that is not equitable and does not reduce emissions significantly. **Congestion pricing has to go in tandem with sustainable mode improvements.** If not, people with lower disposable income will be forced to use other modes of travel that are currently significantly slower while the wealthy population can drive faster.

Given that two (of four) strategic priorities in the 2021 GPS focus on **providing equally good travel mode options** and **responding to climate change by reducing emissions**, measuring success by vehicular LOS or vehicular volume/capacity (VC ratio) seems misaligned with these priorities.

It is recommended to instead measure success in reduction in person-hours and VKT.

This will shift focus to reducing private vehicle travel and increase public transport use while reducing the time needed for travel. In lieu of such metrics, PT will remain in the current condition making car travel the only choice for many non-central zones. VKT and person-hours will force us to use congestion charging to meet our carbon reduction goals. LOS may be acceptable to measure freight which is also one of the GPS goals.

Person-delay and VKT are a step in the right direction. Accessibility by PT and active modes - how they compete with the private car should be considered for Auckland. This will even help identify the projects needed before roads are even priced in some areas.

¹ Report accessed from: <https://www.transport.govt.nz/assets/Uploads/Report/TheCongestionQuestionsTechnicalReport.pdf>

The goal of the congestion pricing should be to improve the transport network performance for all modes of travel and make transport more sustainable.

While the report identified that change of travel time and route as a way to achieve this, other ways to be considered include:

- Re-allocating freed up road space to sustainable travel modes which currently have incomplete networks
- Allocating congestion pricing funds to improve sustainable travel modes (PT, cycling and walking)
 - Infrastructure improvement
 - Functional and contiguous network
 - Reserve tolling to promote use of these modes

2 The Auckland Challenge

2.5 Travel patterns

The report states that “35% of workers have jobs in the Local Board area in which they live” – **This provides a great reason to invest in all ages and abilities cycling infrastructure as these trips would be within the cycling catchment.**

The congestion pricing report should outline a robust programme to create a contiguous cycling network for every phase of implementation.

Figure 8: The graph is showing signs of work trips moving to “Other Central” from “CBD” and to “outer urban” from “inner urban” areas. Congestion pricing should not perpetuate these early signs of sprawl. However, lowering tariff on off-peak-direction travel could result in some businesses moving into rural Auckland. This could also increase the low-density growth as these areas are zoned for such growth. Is there evidence of sprawl with the case studies?

Nearly 40% of employment related destinations are in outer urban areas with limited high-quality high-capacity public transport (rail or bus rapid transport network). Rail network, northern bus way serve inner urban areas only while the proposed north-west busway also serves a small portion of outer urban areas. This indicates limited alternative mode choices in the outer urban areas. This is also corroborated by private vehicles mode share of over 80% in outer urban areas (compared to 75% in Auckland).

Congestion pricing the roadway network should go in tandem with significant strategic PT projects in inner and outer urban areas connecting with the rest of the Auckland. If not, this could result in a network that limits access to opportunities and increased off-peak direction vehicle-kilometres travelled resulting in increased emissions.

Table 4 shows that irrespective of sector in which a work place is located, trip lengths to work places are around 11-13 kms long in 2013 but increase by origin as the distance from the centre increases. Work based travel is equally distributed and it shows the need to connect workplaces throughout Auckland not just the CBD. This warrants a need to invest heavily in PT for commuter trips. Trips are illustrated here: <https://commuter.waka.app/>.

Figure 12 shows average trips lengths by location of the destination is less than 6 kms (for majority of zones) except in rural sector. Table 4 shows work trip lengths are around 11-13 kms long in 2013. Assuming that 2018 destination data includes work and non-work trips, it can be inferred that people are not travelling (or not willing to travel) long distances to non-work destinations.

This suggests that congestion pricing and alternative mode improvements should focus primarily on commuter travel during the peak periods on weekdays.

3 Auckland road network performance

3.1 Current performance

This section talks about current performance of the transport network measured using volume to capacity ratio. This is a vehicle-centric measure not a people-based measure. By focusing to measure success using (predominantly) private vehicle-based metric, congestion pricing could result in creating networks that cater to the people who can pay their way through congestion using single occupancy vehicles.

We recommend using **vehicle-kilometres** and **person-hours** per roadway as metrics. This will keep the focus not only on reducing discretionary travel and improving travel speeds but also moving more people per vehicle.

3.4 Congestion costs in Auckland

Section 3.4.2: Other benefits could be health benefits from reduced emissions and health benefits from using active modes (by themselves or as a part of a PT trip).

The benefits of decongestion outlined by New Zealand Institute of Economic Research such as greater choice in work and housing location will only apply to wealthier residents unless PT is significantly improved. Savings to businesses will be dictated by the price they need to pay for reduced travel time. So, both of these are not a given - not for all residents.

3.5 Environmental performance

With nearly 40% of greenhouse emissions from transport, reducing these emissions through improved speeds and increased PT and cycling use should be a key-goal for congestion pricing.

Part two – congestion pricing theory and practice

4 Congestion and congestion pricing

4.3 Congestion costs

Seems to be written from car-user perspective alone

4.5 Response to congestion pricing

4.5.1 Short-term response

Modal shift is not an option currently available in some sectors of Auckland as noted earlier.

Long-term response – Both changes specified could result in urban sprawl with low-density growth which will limit active mode and PT use.

5 International review

5.1 Types of congestion pricing schemes

Using a GNSS will provide immense data on travel patterns and needs of Auckland residents. This data could help create PT networks that are competitive with car travel. This data could revolutionize land use planning, parking strategy and multiple other efforts. However, smartphone GPS data could be used as a proxy for such studies.

Section 6.3.5: Tracking vehicle type and class is important to promote EV over fossil-fuelled vehicles.

7 Community considerations

7.1 Main terms

7.1.1 Benefits and costs

We recommend additional benefits:

- health benefits from reduced emissions
- health benefits from using active modes (by themselves or as a part of a PT trip)
- reallocation of road space to other modes improving their reliability

7.1.2 Fairness and equity

Further work is required on equity; we need to consider essential workers, as well as community services card holders.

We recommend a study using mobile phone data as a proxy for actual trip data to understand the impacts on vertical, horizontal and spatial equity under various scenarios.

An offset to regional fuel tax could help to balance out inequities. This would be possible with the regional/network scheme but less plausible with the scaled down schemes.

7.2 Social impact studies

7.2.1 Community impacts

The report states that “Congestion pricing is also controversial because ... the biggest benefits fall to the community more widely, including public transport users (who obtain travel time savings without paying the charge) and business-related travellers (who place a high value on time).”

As PT and other sustainable travel modes provide mobility with a much smaller carbon footprint, government should communicate PT improvements as policy.

Business-related travellers that deliver goods may not have alternatives and their services are essential for business growth. However, this needs more review.

7.2.2 International evidence

We agree with the disaggregated spatial analysis; see comment on Section 7.1.2.

Part three – options for congestion pricing in Auckland

9 Options development

9.2 Evaluation criteria

When evaluating benefits, modelling is needed to understand the benefits of other enhancements using the revenue from the schemes. This should factor in PT patronage and infrastructure investment. Also modelling of a scenario where the regional fuel tax persists.

We recommend modelling to understand the benefits of other enhancements using the scheme revenue.

While reducing congestion is weighted 65%, economic, social, environmental and safety considerations are weighted at 20%. To meet the significant reduction in emissions (70% by 2030), significantly higher priority should be given to environment in all transport studies. Solutions that are generated with such weighting will be sustainable solutions that will reap long-term benefits.

We recommend a weighting that will force the options to have PT and active mode improvements as part of the package:

- Congestion – 25%
- Environment – 50%
- Social – 15%
- Flexibility – 10%

9.3 Shortlist options

1. City centre cordoning

Only 23% of employment centres are in CBD and other central areas. This could be even less for just the CBD. This is a unique feature of Auckland that is not comparable to international examples. Congestion pricing just this area would drive businesses away from CBD – the area with best PT connectivity.

2. Isthmus Area

Seems to be a better option than city centre. However, this could exacerbate urban sprawl to other urban areas that have limited to no PT resulting increased car travel. Robust land use policies and incentives could be developed to avoid sprawl.

3. Strategic corridors

Due to the more distributed nature of employment in Auckland, this seems to be the better option. This will also seem like a less targeted option resulting in potentially less public opposition. However, Auckland doesn't have high-quality, reliable and competitive public transport choices as an alternative to these corridors. A plan to improve PT is a must for long-term success. Many complaints are expected from residents on traffic diversion to residential streets. Covering 220kms with ANPR equipment is a big undertaking. As a pilot, this could be implemented with nominal charges on very few corridors with high-speed, reliable, and competitive PT alternatives. A study is necessary to identify these corridors.

4. Strategic corridors and city centre cordon ('combination')

No comments.

5. Regional network

Could be ideal as the overall distance travelled by individuals can be limited and provides more flexibility in providing equity. Such system has additional benefits from actual trip data that can be used for better PT and land use planning. However, the report states that users will be warned of costs and traffic rates prior to travel – how can this be implemented? Will the cost be fixed for all roads during a certain time? It is key to keep this less complicated. It may not be practical to have dynamic price signs on all the roads.

Recommendation: Implement the Strategic corridor option #3 with strategically chosen pilots. Conduct a before and after analysis for each pilot/corridor by using smartphone GPS information to understand behaviour changes.

All the options need to include PT and cycle improvement plans per phase, particularly for people / areas that are less able to afford the congestion charge.

10.1 Network assessment

Congestion pricing could increase carpooling which is a good outcome. Measuring person-delay or VKT will help account for such changes.

What are the assumptions made in modelling for such behaviour changes? Do these interventions include Bus or T3 lanes on motorways to nudge users towards higher occupancy?

Table 15: Should measure the VKT reduction per each scenario. Vehicle average delay should be replaced by person-delay. While these metrics measure efficiency of movement, note that fewer person hours spent travelling may mean that people are missing out on opportunities.

How are Figures 42 and 43 generating different result?

Figure 45 shows higher freight delay in network option. Why is that?

Section 6.2 defines access and point charges differently from Section 11.1.2. Section 6.2 states that access charge is non-cumulative whereas point charges are cumulative.

While the social considerations of access charge system are noted, it could support sprawl as charges are not cumulative. Access charging penalises short trips and long trips pay no more. This encourages urban sprawl and hence could be self-defeating.

Table 24: Daily caps of 2*peak charge of \$7 will cost half of a typical PT journey to travel to and from work. Should consider either lowering PT fares to make PT more attractive.

Table 24: Exemptions to motorcycle and scooters will encourage shift to those modes that occupy less road space.

Table 24: Charge levels should be gradually increased to \$3.5 peak charge to allow users to try other options. Typically, it takes 1-2 months to try each alternative mode of travel.

Table 24: Direction of travel charges should be considered with great care to avoid urban sprawl. Land use and zoning outside central Auckland could result in low-density development not conducive to active mode or PT travel.

Table 25: For majority of Auckland, peak windows are generally 7am-9am and 4pm-6pm. Peak/Shoulder hours are generally 6-7am, 9-10am, 3-4pm and 6-7pm. The smaller peak windows defined would result in a simple shift of peak hours with no reduction in car travel. This is already happening now.

11.5.3: Courier van being charged \$7 a day may be considered as unfair as the service uses public roads for business. May need to be revisited.

11.5.4: At 9:15am and 3:15pm, Auckland network is still congested. Should be shoulder peaks.

Part four – social evaluation

15 Mitigation measures

Some of the most effective mitigation measures would be to invest in public transport, cycling and walking infrastructure. Educating residents about alternative modes should also be part of this effort. Mitigation measure should also include re-allocation of road space to sustainable modes.

Travel mode is a habit formed over a person's lifetime and car usage has been built into the society over many decades.

Reverse tolling (incentivising use of PT, cycling and walking) is a necessary step to incentivize people to use alternative modes.

16 Implementation tasks

In addition to the steps discussed, a geospatial analysis with real-life mobile phone data should be conducted to try various scenarios for pricing, and necessary PT and cycling improvements before implementing the strategic corridor access-based pricing.

16.8 Scheme revenues

Scheme revenues should also be allocated to improve active mode network (quality and connectivity) and for reverse tolling sustainable modes.

Linking scheme revenue to infrastructure programmes can help gain public acceptance.

We recommend ring-fencing net revenues to improve public transport and active modes particularly for people or areas that are less able to afford the congestion charge.

18 Illustrative timetable

We recommend phasing that is purely corridor based and not-region based.

Summary

Based on the report, the primary focus of congestion pricing seems to be to promote more (time and geographically) distributed car travel and a slight reduction in car trips. While charging for space on the road is a start in the right direction, it is inequitable and unsustainable by itself. This could result in:

1. Urban sprawl that may not be compatible with PT use under current zoning laws
2. People with lower disposable income being locked out of opportunities in areas that are served reliably by cars alone
3. Higher private vehicle-kilometres travelled in off-peak direction resulting in more emissions
4. Higher speeds for car resulting will result in less incentives to use other modes

To avoid these consequences, the following actions should be included in the implementation strategy:

1. Make PT and active modes competitive to car travel
 - a. Re-allocate freed up road space to sustainable travel modes
 - b. Allocate congestion pricing funds to improve infrastructure, create contiguous network, and incentive users
2. Charge a nominal amount even for off-peak direction travel per vehicle

Implementation accompanied by:

- a review of land use policies in conjunction with the implementation of a congestion charge to avoid employment centres being incentivised in rural areas, and to support high density development conducive to active/PT travel in inner urban and outer urban sectors
- greater consideration of impact on freight movement/strategic travel
- further investigation into a network distance-based scheme, potentially as a trial

In the light of recently released paper, Transport Emissions: Pathways to Net Zero by 2050, this report needs to be revisited.

With the new objective to decarbonise transport, the current package of interventions do not meet nation's goals and are even working against some of those objectives.