

AGENDA ITEM 13 BOARD DECISION PAPER	
To:	Board
From:	Mark Lambert, Executive Programme Director
Reviewed:	Murray Burt, Director Infrastructure & Place Dean Kimpton, Chief Executive Officer
Date:	22 May 2024
Title:	Time of Use Charging programme
Reason for inclusion in closed board meeting session	
1. Please state why this report is being considered in the closed board meeting as opposed to the open board meeting. Please refer to the 'reasons for confidentiality' and provide a direct reference to one of these reasons.	To protect information that will soon be publicly available: This matter will be before the Transport and Infrastructure Committee on 6 June 2024.
2. Please provide an estimated date for release of this report.	6 June 2024

Aronga / Purpose

1. To seek endorsement of the Time of Use Charging (scheme) programme plan, scheme objectives, key principles and policies along with a short list of options to take forward for more detailed analysis.

Tuku mana / Delegation

2. The cost of this programme is currently within Chief Executive (CE) delegation.

Te tūhunga / Recommendation

That the Auckland Transport Board (board):

- a) Endorse a work programme for the design and development of a demand-management based road-use pricing scheme, which seeks to achieve the scheme objectives as set out at Attachment 1 and is consistent with the key principles set out at Attachment 2.
- b) Endorse the following options being taken forward to identify a preferred option or combination:
 - i. City Centre Cordon.
 - ii. Strategic corridors: inner isthmus.
 - iii. Highly congested locations: motorways and/or arterials.

Te whakarāpopototanga matua / Executive summary

3. The Congestion Question report by the Ministry of Transport (2020) (TCQ) found that congestion charging / time of use charging would be an effective way to reduce congestion in Auckland. It recommended a phased approach of a City Centre Cordon followed by expansion through Strategic Corridors. This was confirmed by the August 2021 Government Transport and Infrastructure Select Committee report 'Inquiry into Congestion Pricing in Auckland'.
4. Auckland Transport (AT) was requested by the Auckland Council Transport and Infrastructure Committee (TIC) in November 2023 to establish a Time of Use Charging programme, including the establishment of a Political Reference Group (PRG).
5. At the November 2023 TIC meeting an indicative timeline was presented that included the need for enabling legislation to be drafted between February 2024 and June 2025 with a scheme procurement commencing around March 2025.
6. This paper outlines the programme approach to progress to a point where AT is ready to commence scheme procurement, and seeks endorsement of the scheme objectives, principles, policies and options to be progressed.
7. To achieve the indicative timeline, the pre-procurement work programme requires iterative and parallel work across a number of activities including:

- a. Communications and engagement across public engagement including deliberative democracy tools, stakeholder engagement and public consultation.
 - b. Scheme policy and design including impacts on communities and individuals and potential mitigations.
 - c. Development of a Detailed Business Case (DBC) or equivalent as agreed with New Zealand Transport Agency Waka Kotahi (NZTA).
 - d. Identification of technology solutions including with NZTA.
 - e. Preparation of scheme specifications, procurement and contractual mechanisms.
 - f. Expected collaborative engagement with government in drafting of enabling legislation.
8. The proposed primary scheme goal is travel demand management, aiming to increase road corridor productivity. Other benefits, such as emissions reduction and mode shift, will be tracked but are not the priority for scheme design.
 9. TCQ recommended policies will also be progressed, balancing effectiveness, fairness and simplicity, using Automatic Number Plate Recognition (ANPR) cameras, a single 'access charge' and minimising exemptions.
 10. Following on from TCQ recommendations and PRG 21 May 2024 feedback, three options will be analysed: City Centre Cordon, Strategic Corridors (inner isthmus), and highly congested locations (motorways and/or arterials). These will be assessed for congestion levels, travel pattern analysis, alternative viable travel options, impacts and mitigations, alignment with future planned improvements.
 11. In June 2024, the TIC will be asked to endorse the objectives, principles, policies, options for analysis and engagement plan included in this paper.

Ngā tuhinga ō mua / Previous deliberations

Date	Report Title	Key Outcomes
May 2023 Board	Road Pricing with Tauranga City Commissioners	Tauranga commissioner Stephen Selwood joined to discuss Tauranga's work to date and plans for the future
May 2024 Design and Delivery Committee (committee)	Time of Use Charging Programme	Endorsed work programme, scheme objective and four options for analysis. Following PRG 21 May meeting feedback, option 3 highly congested locations: motorways to be included in option 4 highly congested locations: motorways and/or arterials and changes to para 28e) and f) to reflect that discounts and exemptions while needing to be assessed to mitigate impacts should be kept to a minimum to preserve the effectiveness of the scheme. Minor change to recommendations. New paragraphs 33 to 36 and update to paragraph 29 and 43 discussing the findings of the Northern Infrastructure Forum sponsored deliberative democracy community panel process that completed on 11 May 2024, after the preparation of the Committee paper.

Te horopaki / Background

12. Demand based road pricing has previously been investigated for introduction in Auckland. Based on international experience it has been considered as an important part of the toolbox to manage demand for use of the roading network.

13. TCQ was an investigation by the Auckland Transport Alignment Project (ATAP) partners to consider whether there is a case for introducing a congestion pricing scheme for Auckland. It recommended a phased approach of pricing via a City Centre Cordon followed by expansion through pricing on Strategic Corridors.
14. The August 2021 Government Transport and Infrastructure Select Committee recommended that the Government: progress legislation to enable New Zealand cities to use congestion pricing as a tool in transport planning; implement a congestion pricing scheme in Auckland as described in the TCQ reports; undertake broad public engagement to help people understand the costs and benefits of a specific scheme; and use any revenue raised by a congestion pricing scheme to mitigate equity impacts and reinvest in public and active transport in the region where the charge applies.
15. Government has signalled through the Draft Government Policy Statement on Transport support for an Auckland Time of Use Charging scheme.

Te hononga ki te “Statement of Intent 2023 - 2026”/ Alignment to Statement of Intent 2023 - 2026

16. This work programme closely aligns with the Statement of Intent principles including:
 - a. Identifying overall benefits (and disbenefits) to impacted users (regardless of mode) in the form of travel time impact on key arterial and motorway routes, and weigh this against financial impact and impacts on other users of the transport network.
 - b. Balancing the needs of Aucklanders in the short-term with a desire to achieve longer-term and future outcomes to determine an appropriate starting point for project implementation.
 - c. Effectively leveraging the existing network to get the most out of what we already have.
 - d. Consider affordability and value for money in option development.

Me mōhio koe / What you need to know

Programme Plan

17. The programme is planned to be delivered in 4 phases. Appropriate governance approvals are planned for each milestone.
 - a. Phase 1 – ready for public consultation – April to October 2024.
 - b. Phase 2 – ready for scheme procurement – October 2024 to 2Q2025.
 - c. Phase 3 – procurement – Q2 to Q32025.
 - d. Phase 4 – implementation – Q32025 onwards.
18. Phases 1 and 2 require accelerated and iterative work across eight parallel workstreams: Programme Management and Governance, Communications and Engagement, Policy and Strategy, Business Planning and Commercial, Scheme Design, Technology, Complimentary System Design, and Delivery.
19. The timeline is dependent on:
 - a. Drafting and enactment of enabling legislation and any secondary government scheme approval process.
 - b. Engagement with NZTA, in particular on scheme policy and design, technology and national approach to congestion charging.

Scheme Goals

20. The programme builds upon TCQ recommendations to develop a scheme based on travel demand management with the primary objective to improve network performance. This is measured by an increased level of service (average speed/travel time) resulting in improved road productivity (people movement). The appropriate level of improvement initially sought is approximately 8-12% at the applicable network location. This is often referred to as the level of improvement experienced during school holiday periods.
21. Resultant benefits include revenue generation, reduction in emissions, and mode shift. These are identified as benefits that will be achieved through the implementation of time of use charging, but the scheme will not be designed to maximise these outcomes.

22. As a travel demand management tool, the preferred behaviour changes include time of travel, mode shift and avoided trips (e.g. work from home, ride pooling, or combining trips).
23. Secondary scheme goals will be to minimise unwanted second order effects, such as unnecessary diversion, community severance, excessive financial impacts, transport and access poverty/deprivation.

Options & Analysis Methodology

24. Option development will build upon TCQ recommendations of a city cordon and strategic corridors schemes. The strategic corridors will be developed through a staged implementation to assess which corridors are appropriate for early implementation. Additional options were included in the assessment process to consider existing and forecast highly congested locations, and following feedback from the PRG meeting on 21 May, were combined into a single option.
25. The options are:
 - a. City Centre Cordon.
 - b. Strategic corridors: inner isthmus.
 - c. Highly congested locations: motorways and/or arterials.
26. Early analysis is underway to assess the existing and forecast most highly congested locations on the network to determine where implementation of pricing signals could be most appropriate. The criteria being considered include:
 - a. Congestion prioritisation: traffic volumes, level of service and corridor productivity.
 - b. Travel pattern analysis: origin-destination assessment; transport poverty/deprivation, diversion impacts, preferred charging locations at the point of congestion, upstream or downstream.
 - c. Alternative viable travel options.
 - d. Future planned network improvements and interventions.
27. Detailed scheme design recommendations to optimise outcomes and minimise negative impacts will be developed.

Initial Policies

28. Building on TCQ, the following policies have been adopted for progression. Following feedback from the PRG meeting on 21 May, para 28e) and f) were changed to reflect that discounts and exemptions, while needing to be assessed to mitigate impacts, should be kept to a minimum to preserve the effectiveness of the scheme.
 - a. Scheme design considerations: balance between effectiveness, fairness and simplicity; a minimum or appropriate initial implementation.
 - b. Tariff attributes: to be determined by what is required to meet the scheme objective of a 10% improvement in corridor performance. It can be varied after implementation to ensure it remains appropriate. Charges are not cumulative within a defined period of time through 'one-off' access charges.
 - c. Technology: vehicle detection using market available ANPR cameras, and allowing for potential future implementation of in-vehicle GPS technology where the investment case warrants.
 - d. Use of revenue: preferred to be re-invested into the local transport system; transparency in the use of revenue is paramount in achieving public support.
 - e. Exemptions and discounts: should be kept to a minimum to preserve scheme effectiveness.
 - f. Social mitigations: alternative transport options should be available.

Communications and Engagement Plan

29. The communications and engagement strategy focusses on ensuring all stakeholders understand how time of use charging relates to them, building social licence to ensure the scheme is successfully delivered with stakeholder support, and providing opportunities to inform the scheme policies and design.
30. Deliberative democracy will be used to engage and gain insights to inform scheme design and implementation, and better understand how we can engage with the public. The first round is now complete (refer below), led by the Northern

Infrastructure Forum and the University of Auckland's Koi Tū programme. AT is planning a second round to be held by Koi Tū in July/August.

31. Key stakeholder groups have been identified with a stakeholder engagement strategy developed.
32. We are working closely with the Auckland Council communications team who will provide communications and engagement support. Regular communication is underway with the Mayor's Office.
33. Public consultation is planned for 5 weeks over October/November (subject to programme, legislation and approvals).

Deliberative Democracy first round feedback

34. The Northern Infrastructure Forum sponsored deliberative democracy community panel process has been completed on 11 May. The community panel has prepared a short initial report on its considered scheme objective and seven guiding principles. A full report is being prepared by Koi Tū.
35. The community panel proposed one objective for the scheme: to reduce congestion.
36. Their proposed seven guiding principles:
 - a. Mitigate impacts on disadvantaged people through discounts and exceptions
 - b. Prioritise development of viable & reliable alternative transport options
 - c. Revenue should be managed by Auckland local government to improve accessible transport options
 - d. Pricing should be simple and transparent
 - e. Initial size/boundaries should be large enough to make a network-wide impact, but avoid being too complex
 - f. Payment system must be user-friendly and reliable
 - g. Communication of the scheme should be clear, transparent, and unbiased, and focused on objective of reducing congestion

37. The objective and seven guiding principles align strongly with the programme's own recommendations within this paper. The findings will be shared with the PRG and included in the Time of Use Charging report to the 6th June TIC.

Ngā ritenga-ā-pūtea me ngā rauemi / Financial and resource impacts

38. The programme is on a constrained timeline with multiple overlapping workstreams leading to business case/investment case approval (estimated early 2025). The investigation phase is split into two stages:
 - a. **Stage 1 – get ready for public consultation – to October 2024.** Total estimate \$2.87m operating expenditure across internal and external resources; approved under existing delegations; covered in 2023/24 under existing budget and 2024/25 by the draft Long Term Plan (LTP) 2024-34.
 - b. **Stage 2 – get ready for scheme procurement – October 2024 to second quarter 2025 with potential overlap with Stage 1.** Total estimate \$2.25m-\$2.6m capital expenditure subject to preferred scheme and technology choices, across internal and external resources; covered by draft LTP 2024-34.
39. Prior to moving into the procurement and implementation phases, the capital expenditure for the scheme and expenditure profile will be confirmed and approval sought through an investment case. The updated draft LTP 2024-34 proposal includes \$158.6m over FY25 to FY28. National Land Transport Fund (NLTF) co-funding is yet to be confirmed.
40. AT's net revenue position for any scheme will depend on scheme design, operating model and revenue split between Auckland Council, AT and Government agencies. These will be defined as the programme and legislation are developed.

Ka whaiwhakaaro ki te Tiakanga Taiao / Climate change and sustainability considerations

41. A modest emissions reduction benefit is expected as a by-product of the introduction of a time of use charging scheme.

Ngā whakaaweawe atu anō / Other impacts

Relationship	Consulted Y/N	Views and Perspectives Received
Māori	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>	Houkura Independent Māori Statutory Board has representation on the PRG. Mana whenua will attend hui from June/July 2024. A mataawaka engagement strategy is being developed with the AT Māori Engagement Team.
Elected members	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>	TIC provided endorsement for programme formation in November 2023, and will be asked for endorsement of policies and options at the 6 June 2024 meeting. Mayor's Office has been consulted on 5 March 2024 and 23 April 2024. PRG (Mayor, 7 Councillors, 1 Houkura IMSB member) has been consulted on 20 March 2024 and 26 April 2024. Local Boards will be engaged mid-2024.
Council Controlled Organisations	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>	AC is a programme partner and has representation on the Programme Control Group (meeting scheduled w/c 6 June 2024) and in the Programme Lead Team.

		Eke Panuku will be included in ongoing Programme Advisory Group.
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Ā muri ake nei / Next steps

42. Late May 2024 (date to be confirmed) – third PRG meeting – direction on policies and options to be sought.
43. 28 May 2024 – Board endorsement of objectives, principles, policies and options sought.
44. 6 June 2024 – TIC – endorsement of objectives, principles, policies and options included in this paper sought. The findings and / or initial report from the Northern Infrastructure Forum sponsored deliberative democracy community panel will be included. Media engagement will be managed as the TIC meeting is public.

Ngā whakapiringa / Attachments

Attachment #	Description
1.	Scheme objectives
2.	Scheme principles
3.	Scheme policies and options to progress

Te pou whenua tuinga / Document ownership

Submitted by	Recommended by	Approved for submission
Mark Lambert Executive Programme Director (Author)	Murray Burt Director, Infrastructure & Place	Dean Kimpton Chief Executive
		

Attachment 1	Time of Use programme - Scheme Objectives
Time of Use programme	

1. Primary objectives

1.1. Travel demand management

- Time of travel shift where possible: graduated charges encouraging users to retime their journey where possible to spread out peak demand.
- Support mode shift: scheme design and implementation supported by viable alternative choices, such as public transport with frequent services, with respect to existing travel patterns.
- Avoid trips: where possible, reduced travel through increased work from home (for commuting trips) or combining multiple trips.

1.2. Improvement in network performance

- TCQ suggested order of 8-12% improvement in network performance (equivalent to school holiday level improvement) through a comprehensive scheme at targeted network points.
- Maximise productivity of roads, measured by level of service movement from E to D, increasing average travel speed compared with posted speed limit and reducing resultant traffic volume.
- Will also include reliability benefits (more consistent travel times with less variability).

2. Secondary objectives

The scheme will result in these secondary benefits, however to ensure the scheme remains effective in its primary goal of improving network performance, these are not prioritised in option development.

- Revenue generation

- VKT reduction
- Mode shift
- Emission reduction / air quality

3. Minimising unwanted second order effects

These are non-benefits that may be caused by a Time of Use scheme.

- **Diversion impacts.** This can be caused by drivers avoiding a charge by moving their journey to a non-charged route. Can result in higher traffic volumes on those routes, leading to negative impacts to local residents/businesses and impacts to local public transport, particularly in the absence of priority lanes.
- **Community severance.** Where a chargeable route/area divides an area, residents may not have a free journey to local destinations (e.g. school, shops, community facilities), effectively limiting available social opportunities.
- **Higher overall costs to users.** A Time of Use charge paid by users may increase overall costs, however this should be considered alongside the benefits of any scheme (including reinvestment of revenues) and changes in the transport cost base in Auckland, for example removal of the Auckland Regional Fuel Tax.
- **Unacceptable increase in transport deprivation.** Increased costs may reduce transport options for some users.

Attachment 2	Time of Use Charging programme – Attachment 2 – Scheme Principles & Policies
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Time of Use Charging programme

1. Scheme Principles

1.1. Consistent with other transport plans/policies

- Time of Use Charging primary objective is for travel demand management to enable the road network to perform better by improving traffic flow.
- Time of Use Charging must also be consistent with transport strategies e.g. Government Policy Statement, Auckland Integrated Transport Plan.

1.2. Effective building of public, community and stakeholder engagement platform

- The programme must increase public knowledge and understanding throughout the phases, seeking to build a recognition of the benefits of any scheme.
- This includes addressing the concerns of the public, elected members and key stakeholders.

1.3. Require good value and investment case

- While revenue is not a driver for the scheme, value for money is an important requirement for the programme viability.
- An investment case will need to demonstrate net positive benefits against disbenefits and costs.

1.4. Cost effective to operate – cost neutral or better

- Operating costs should be kept to a minimum, seeking efficiencies and economies of scale where appropriate.

1.5. Protects privacy and secures data

- Any scheme, including third party suppliers, must be compliant with all applicable regulatory requirements on customer data, including financial information.

1.6. Perceived as fair and equitable

- Any scheme must consider the social impacts (positive and negative) it may have on all demographics and customer types.
- Mitigations to offset social impacts should be considered where appropriate.
- The availability of alternative travel choices will be considered. It may also improve scheme effectiveness by facilitating mode shift.

1.7. Transparent in setup, operation and revenue allocation

- The scheme must be transparent in all aspects, which will lead to improved public and stakeholder understanding.

2. Scheme Policies

2.1. Tariff attributes

- Tariff value set to achieve ~8-12% network performance improvement or desired level of service at the point on the network.
- Single 'access' charge to avoid multiple charges during a single period.
- Inter-peak and weekends to be considered where congestion is present.
- Initial scheme will be ANPR only; future iterations may use alternative technology.
- Potential to progress to alternative technology solutions in the future.

2.2. Exemptions

- Exemptions kept to a minimum.
- Emergency vehicles and public transport vehicles to be exempt.

2.3. Use of revenue

- Transparency of use of funds is required to be part of the scheme design.
- Auckland preference for local utilisation of revenue as it is entirely locally sourced.

2.4. Scheme design elements

- Finding the correct balance between effectiveness, fairness, and simplicity.
- Consideration of a Minimum Viable Product or appropriate initial phase implementation in terms of public acceptability and realising early benefits, while ensuring medium to long term scheme design and opportunities.
- Change management and capacity for change across the transport network, public and stakeholders will need to be balanced through potential phased rollout.
- Network benefits and impacts need to be consider upstream, downstream and at point of pricing.
- Technology requirements should utilise market available or adaptation of existing network solutions.



Time of Use Charging

Policies & Options

AT Board Update



Mark Lambert, Graeme Gunthorp, Hamish Bunn

28 May 2024



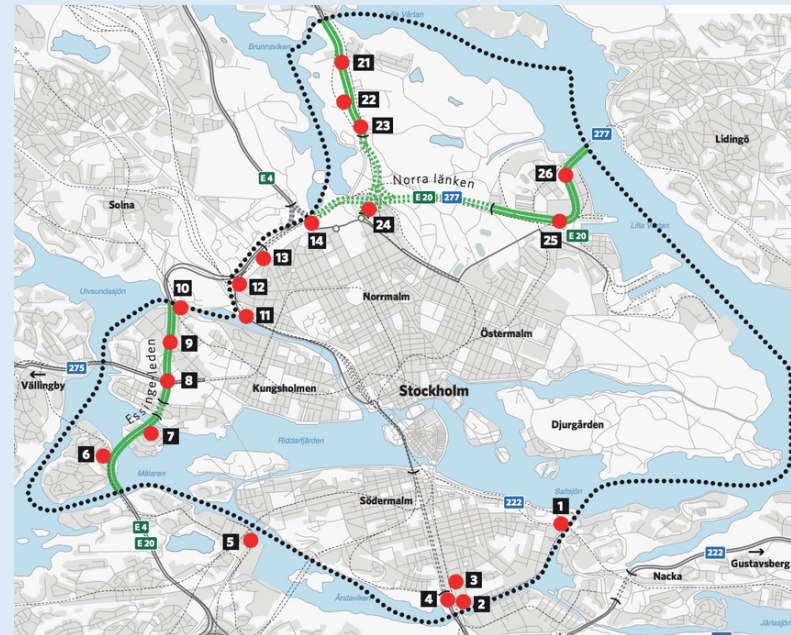
Introducing the language

There are three main types of scheme that will be considered in the Time of Use work going forward

Cordon schemes

Charges users for crossing a particular cordon. Movement that stays within the cordon is free.

Example: Stockholm

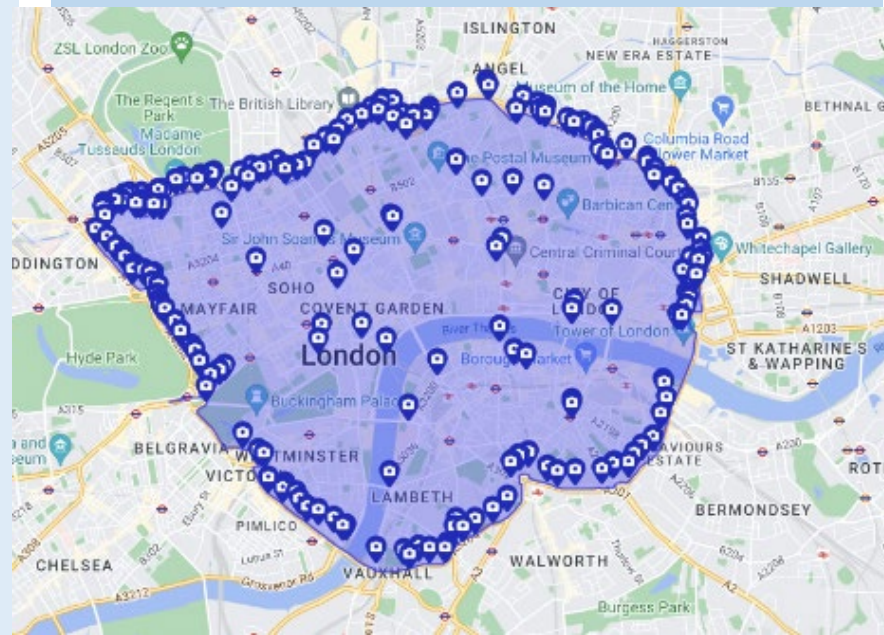


Area schemes

Charges users who travel within a particular area, including those who may come into that area

In practice it may only charge at key locations within an area.

Example: London

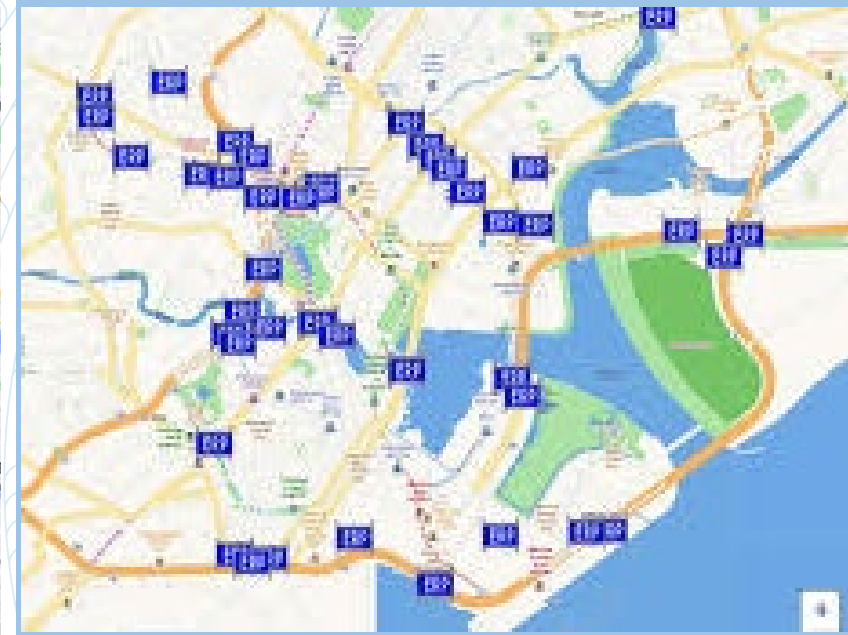


Corridor schemes

Charges users who travel on a particular corridor – e.g. a motorway or key arterial.

Can be cumulative (point charges) or single (access charges)

Example: Singapore



Previous work

Road pricing options have been extensively studied in previous reports, culminating in ‘The Congestion Question’ work of 2020

There have been several major previous studies of road pricing options for Auckland:

- 2006: Auckland Road Pricing Evaluation Study (ARPES) Considered five options to manage congestion and raise revenue and recommended that pricing schemes had merit but further work is needed.
- 2008: Auckland Road Pricing Study (ARPS) delivered a more detailed evaluation for a congestion scheme (Isthmus area) and revenue scheme (Inner Isthmus Cordon), concluding that the congestion scheme would have a strong contribution to transport outcomes, and that without pricing it will be difficult to continue improving transport outcomes.
- 2014: Future Auckland Transport Funding (FATF) report commissioned by Auckland Council, with the focus not to address congestion but rather on efficient charging options to maximise revenue.

Options considered in previous studies

Cordon options

City centre cordon
Inner urban cordon
Urban cordon
Double cordons
Employment centre cordons
Zonal cordons
City parking levy

Area options

City centre area
Inner urban area
Isthmus area
Urban area

Distance options

State highway / motorways
Strategic corridors
Targeted congested corridors
Regional network
Express lanes
Fuel tax

Blended options

Access charges:
Motorways and arterials
Inner isthmus area

The Congestion Question

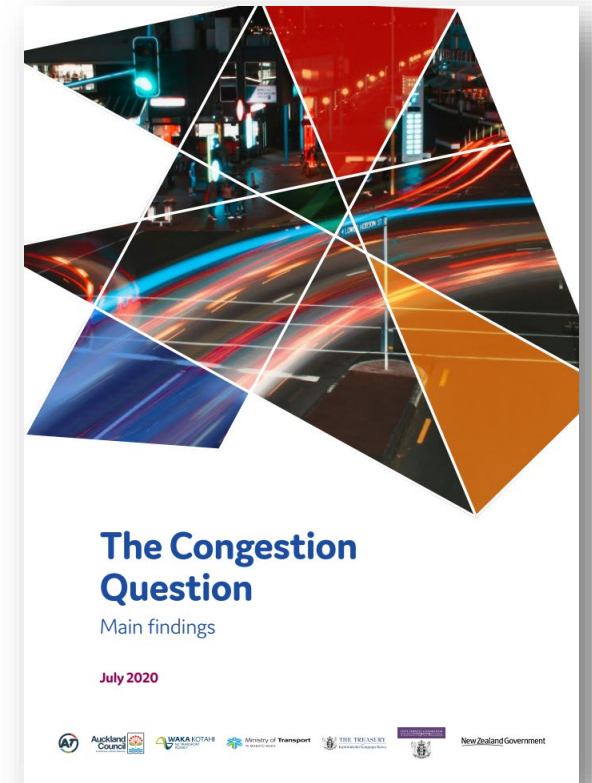
TCQ Recommendation

TCQ reassessed previous scheme options and shortlisted the following 5 options:

1. City centre cordon (peak direction only)
2. Isthmus area (enter/travel within)
3. Strategic corridors (main roads across the Auckland region)
4. City centre + strategic corridors
5. Regional (GPS tracking all congested roads)

TCQ recommended a phased approach: city centre, followed by charging strategic corridors within specific areas, such as the inner isthmus.

TCQ also recommended scheme characteristics, such as: use of camera technology, a single access charge, minimal exemptions and discounts, and setting the charge to achieve a 10% reduction in congestion (equivalent to school holidays).



Given the extensive work done by TCQ and its positive reception, including by the Transport and Infrastructure Select Committee, Auckland policy development will use existing TCQ work wherever appropriate

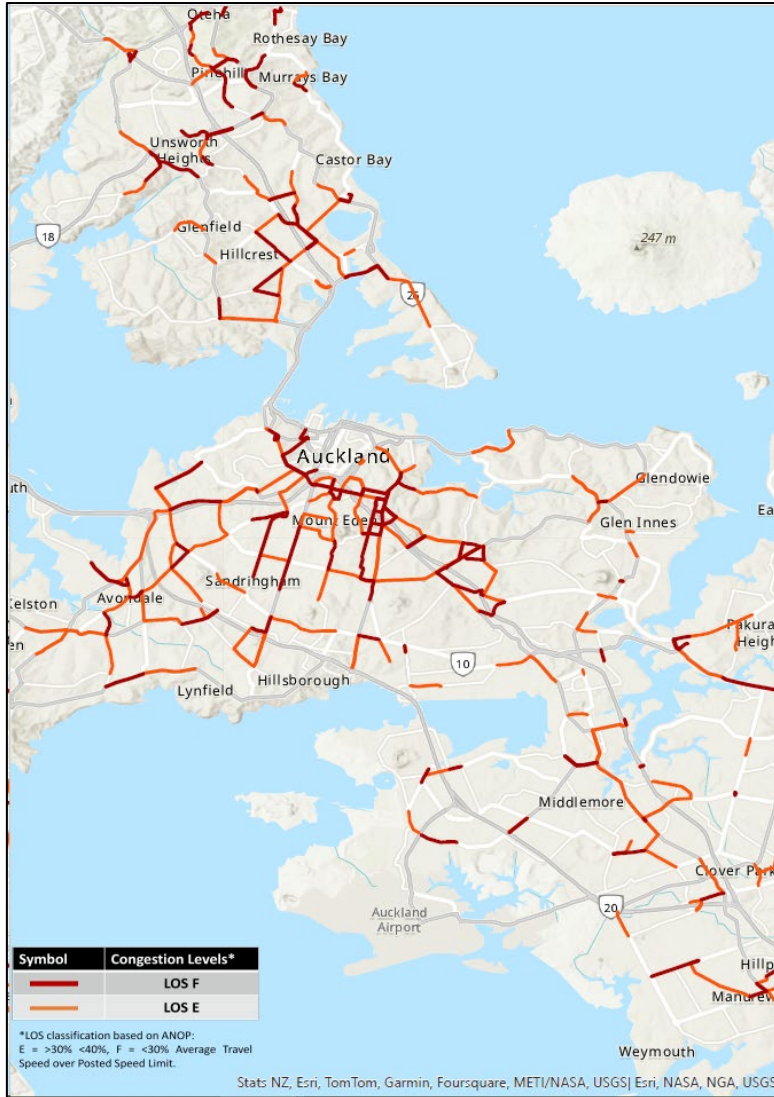
Context – Key principles in successful schemes

- Effective congestion reduction impact
- Alternative travel options are perceived to be available for charged areas
- Scheme is simple to understand
- Revenue collection schemes are generally opposed by the public
- Technical feasibility using available technology – generally automatic number plate recognition cameras
- Impacts on vulnerable user groups are avoided or managed (without adding complexity to the scheme)
- Other externalities, such as traffic diversion, are managed

Where is the congestion?

AM Peak congestion occurs across the region, but is generally worst inbound on the motorway network and within the inner isthmus. These are key areas to try and address through charging options.

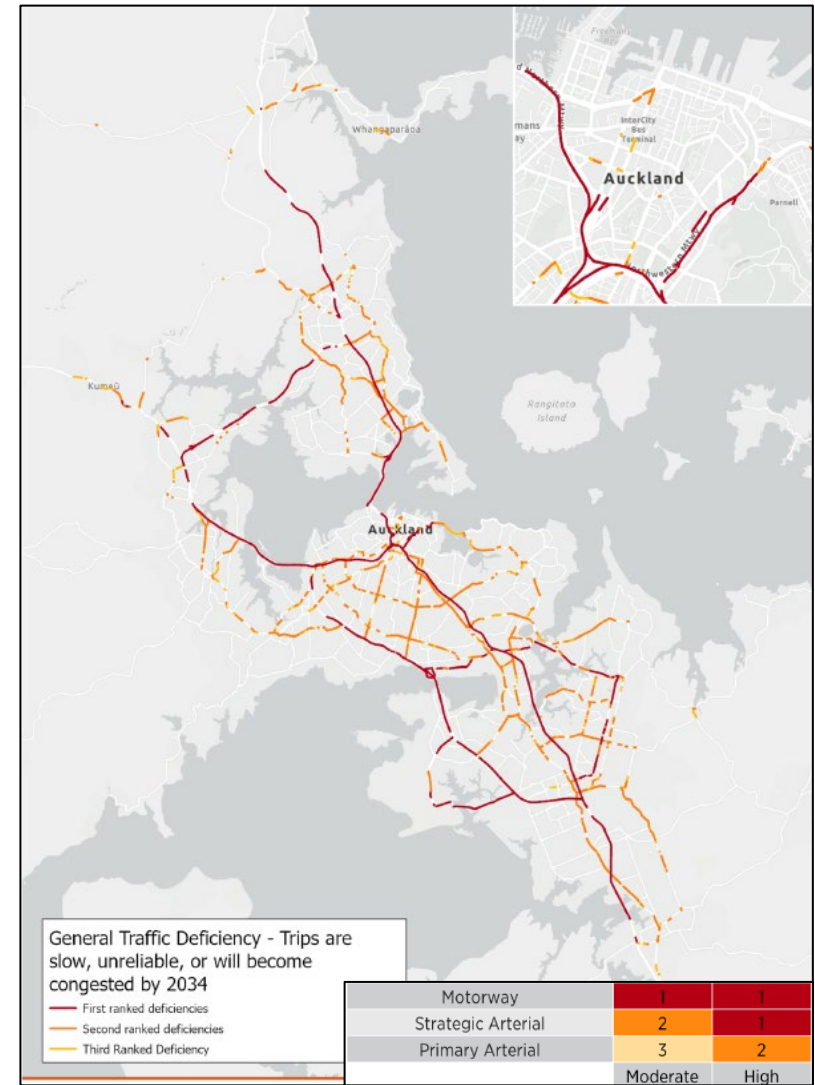
Arterial Level of Service E and F



Worst congestion hotspots (March 2024)



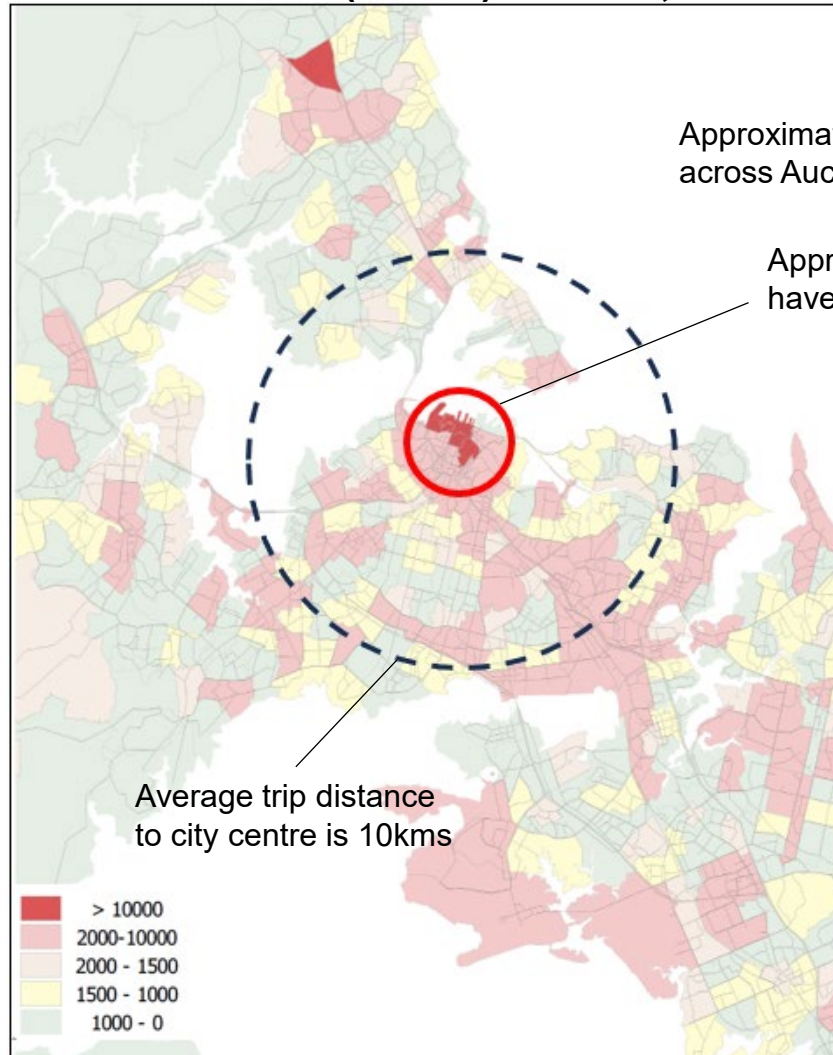
Forecast congestion (ranked) – 2034



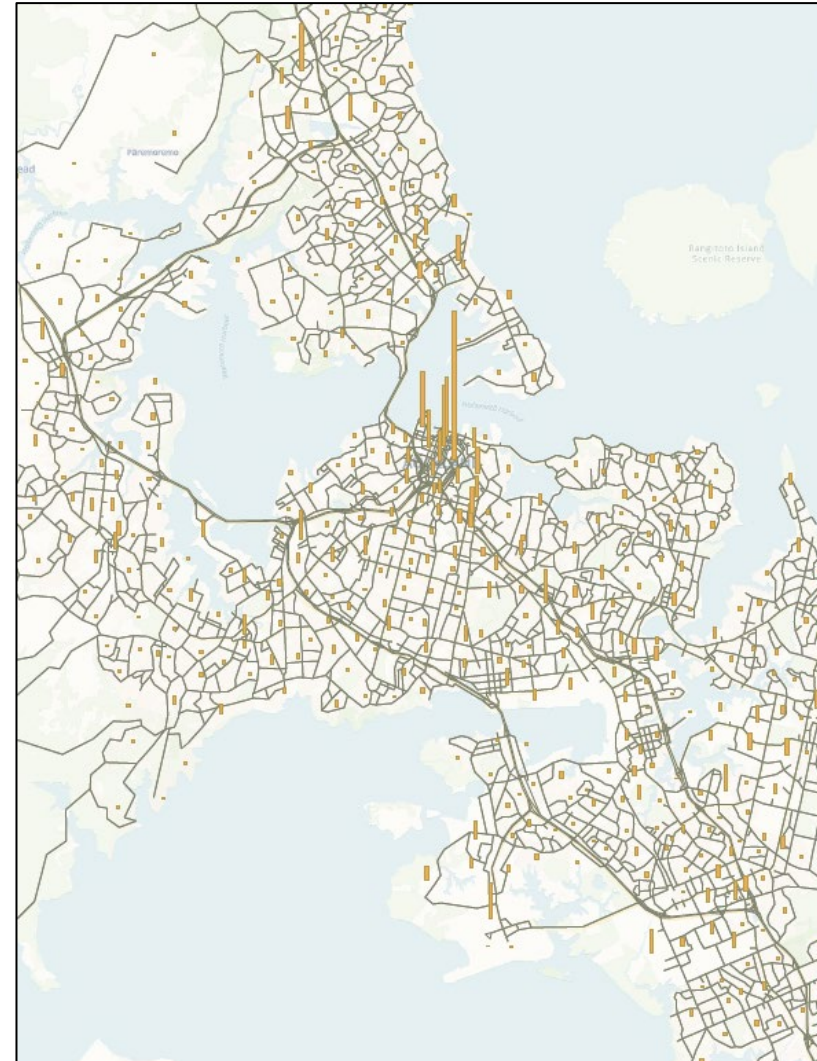
Where is AM peak demand concentrated?

AM peak demand is generally spread across Auckland. However, the city centre is a key focus for demand accounting for around 10% of all trips (around 7% of vehicle total vehicle trips). With an average trip distance of around 10kms, changes here can have effects across the wider network.

Total travel demand (car + PT) – AM Peak, destination

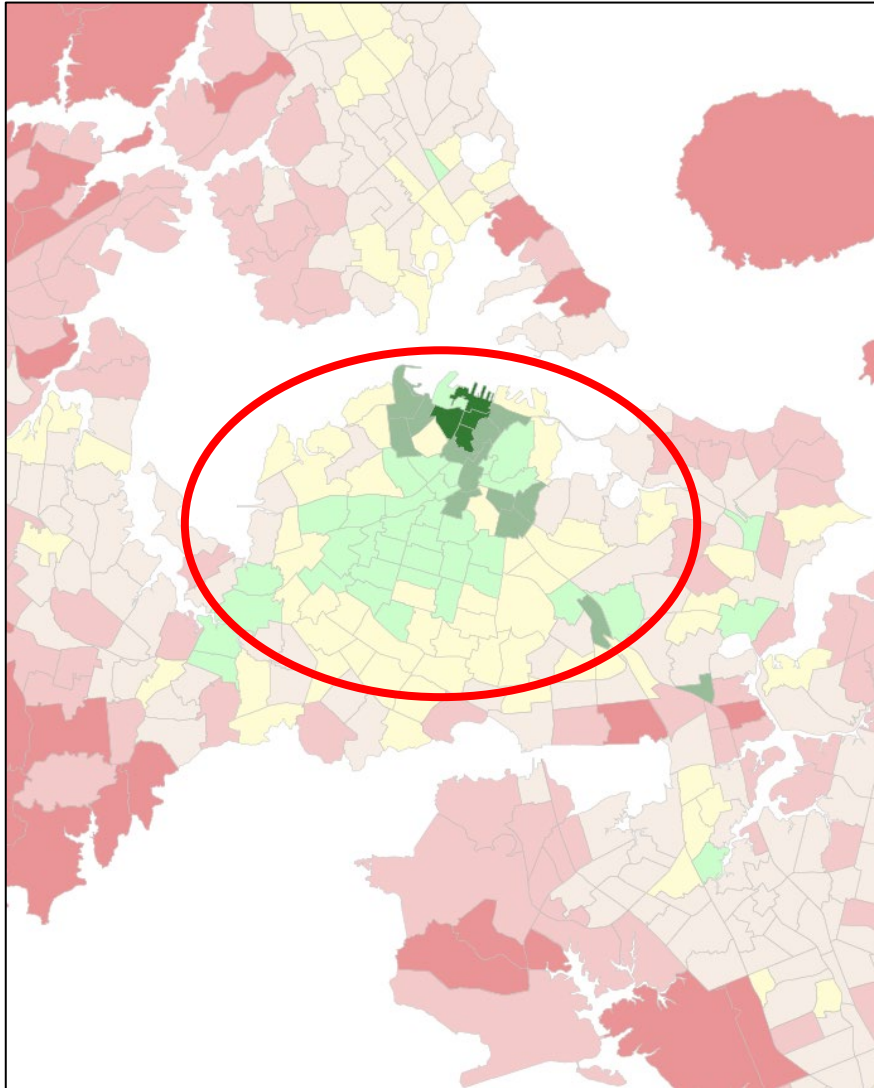


Total travel demand alternative view

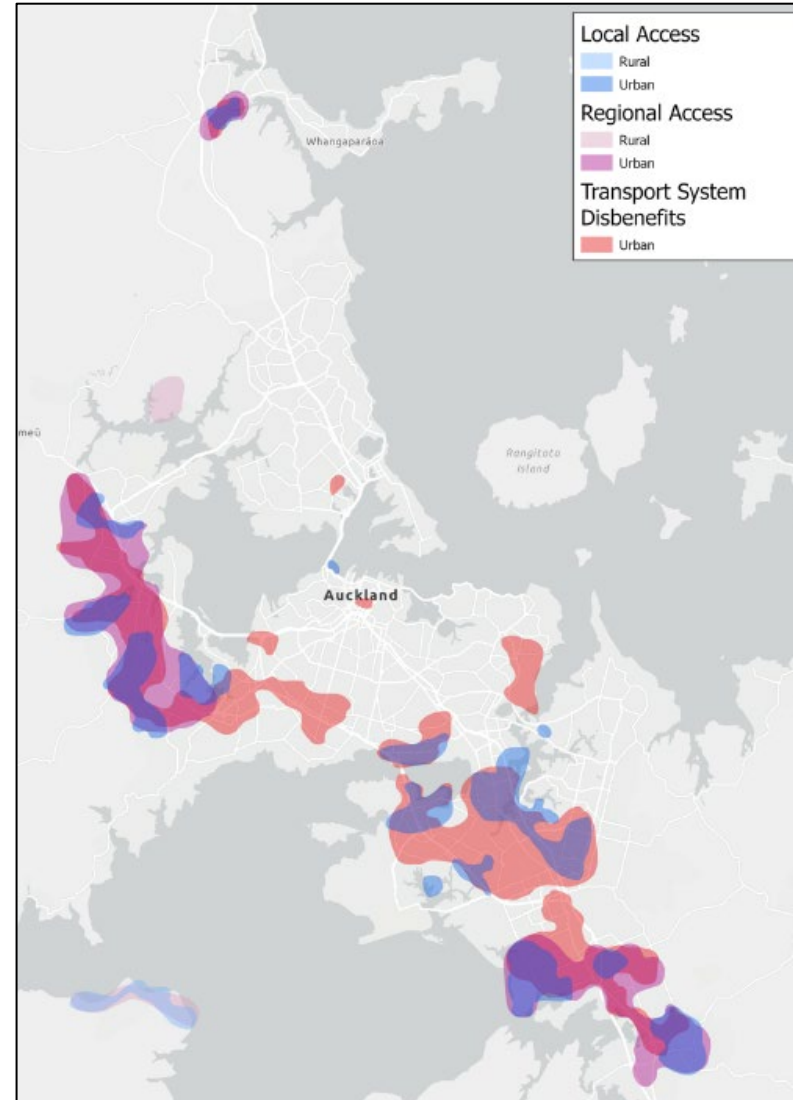


Opportunity areas, areas to avoid

Opportunities - Destinations well served by PT



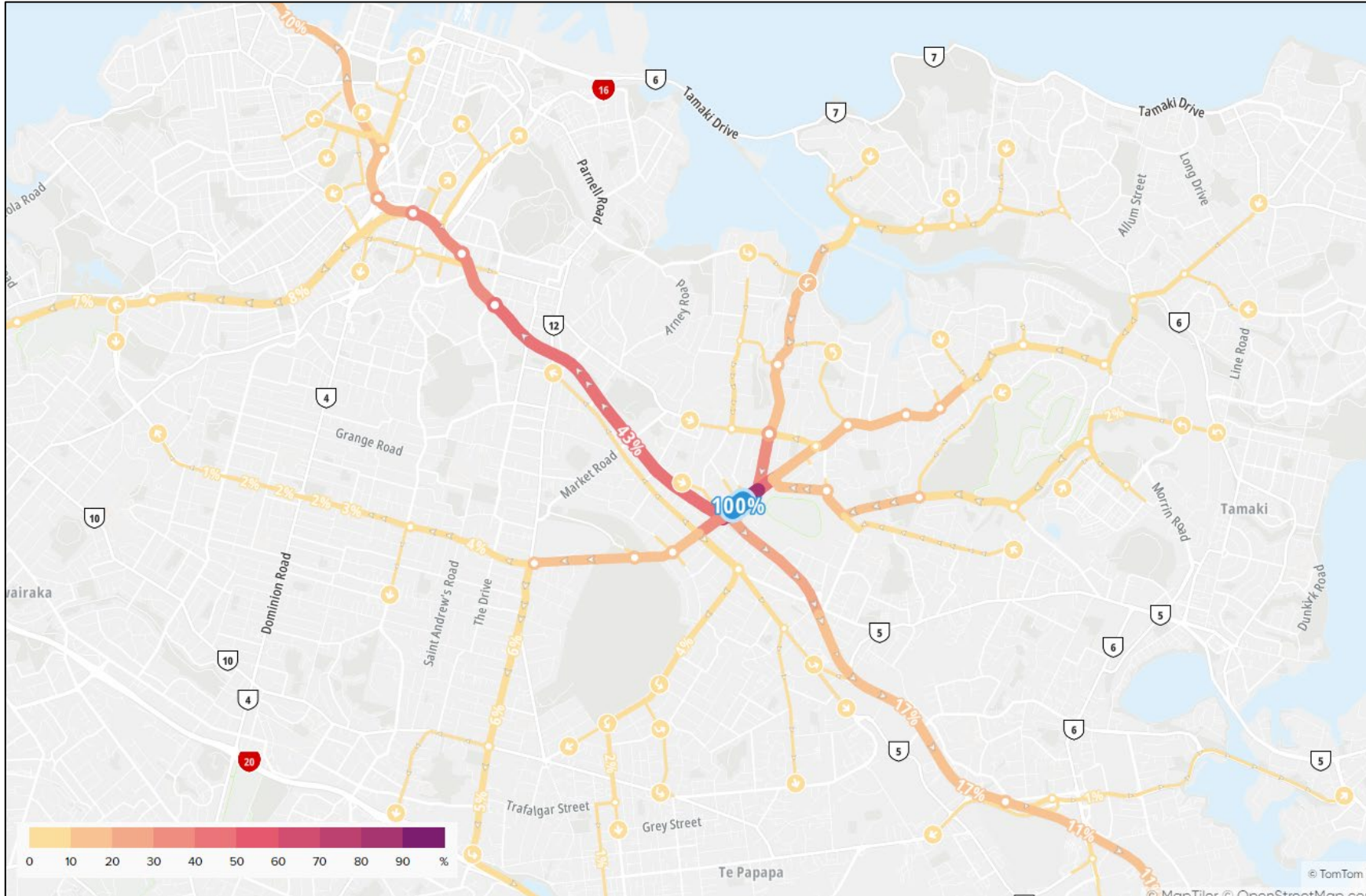
Avoid - higher deprivation / low access areas



- Trips to the city centre and inner isthmus are well served by PT transport.
- PT is generally not a good alternative for trips to most other locations.
- Lack of a PT alternative may make a charge punitive for some travellers. It will also increase the size of the charge needed to have an effect, while increasing potential diversion impacts.
- Meanwhile, pricing schemes would generally want to avoid impacting on areas of high deprivation and low transport access in the south and west.

Trip distribution, alternatives and point charging

Example: Greenlane destinations



- Auckland's distributed trip patterns present challenges for publicly acceptable pricing schemes.
- Most trips passing through congested areas outside the city centre do not go to places where there is an effective PT alternative
- For example, the map shows the distribution of origins and destinations for westbound trips along Greenlane East in the AM peak.
- As the map shows, trip destinations are widely dispersed, with a large proportion going to areas that are less well served by PT.

Issues with point charges – diversion impacts

Example: SH1 Mt Wellington point charge



Example: SH16 Pt Chev point charge



Change to
vehicle volumes

- Reduction
- Increase

Charging at single points on a road network can lead to diversion issues as travellers rat-run to avoid the charge.

This can be seen in the above modelling plots for a motorway charge scenario, with some trips (in orange) diverting onto the local road network to avoid the motorway charging point. Ideally, we would want to avoid more traffic on the local network due to the impact on bus routes, as well as houses and businesses.

Diversion impacts are not necessarily a fatal flaw, but their impacts do need to be considered.

Option development



Options to take forward for analysis & development

Analysis of highly congested locations (underway)

~~1. Primarily motorways~~

~~2. Motorways and arterial corridors~~

PRG 21 May asked for these options to be combined into a single option: "Motorways and/or arterials"

TCQ recommended options – used as baseline, updated with latest data and forecasts

3. City Centre cordon

4. Inner Isthmus Area Strategic Corridors

Combination and phasing of implementation

- ✓ Phasing could be over number of years to realise full network benefit over a number of options
- ✓ Opportunities to accelerate a Phase 1 / demonstration

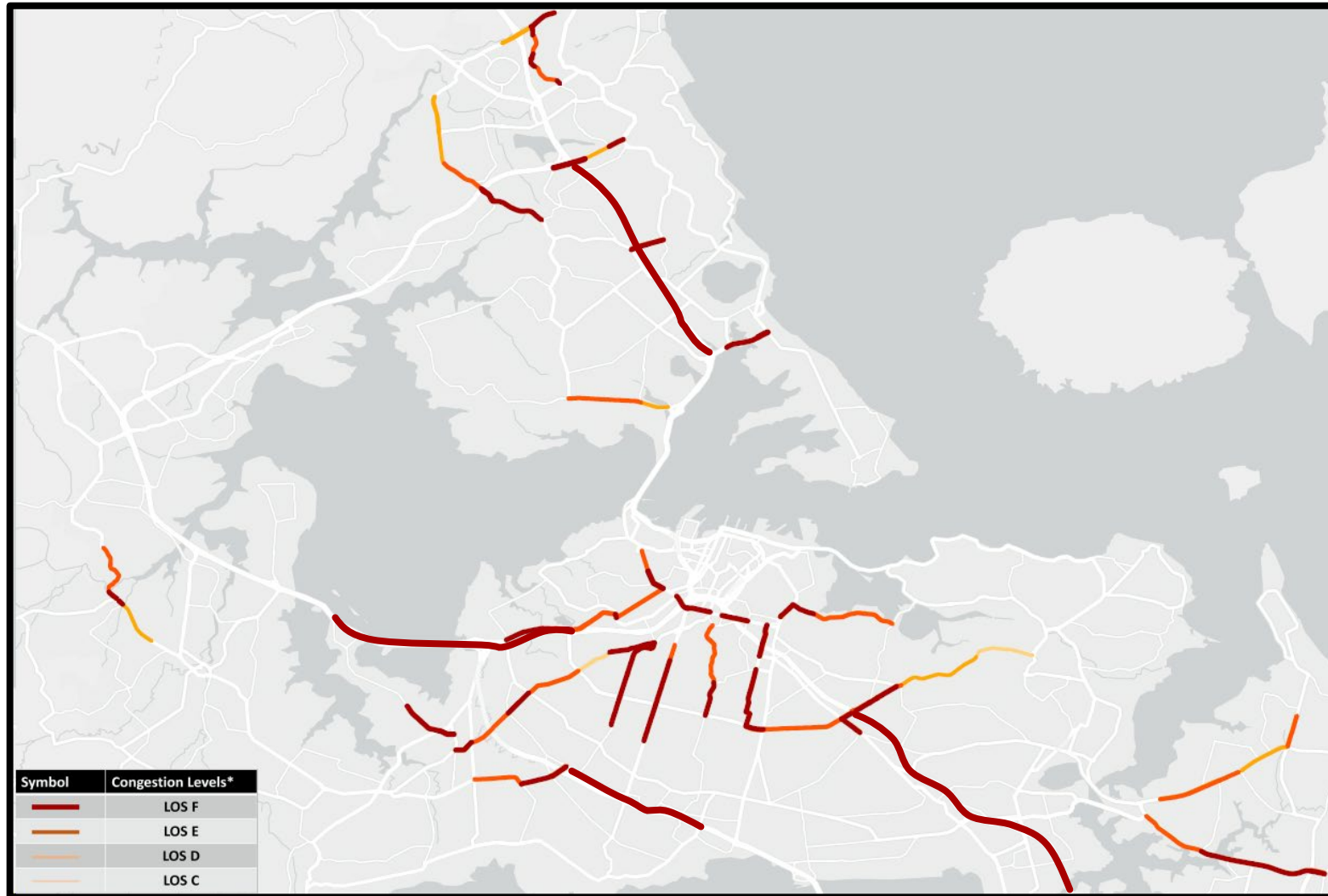
TCQ shortlisted options not further considered (does not preclude future expansions)

- ✗ All roads on isthmus (including local) – capex intensive, doesn't allow for local trips
- ✗ Regional network (requires GPS transponder) – capex intensive, poor BCR

Three options to be taken forward and reported back

Targeted congestion points – motorway and arterials

Illustrative only – most significantly congested roads



This option investigates the most congested motorway and arterial locations. Analysis will be conducted to recommend which of these points locations (including motorways) may be suitable for an accelerated scheme demonstration.

Pros

- *May* have large congestion reduction benefits.

Cons

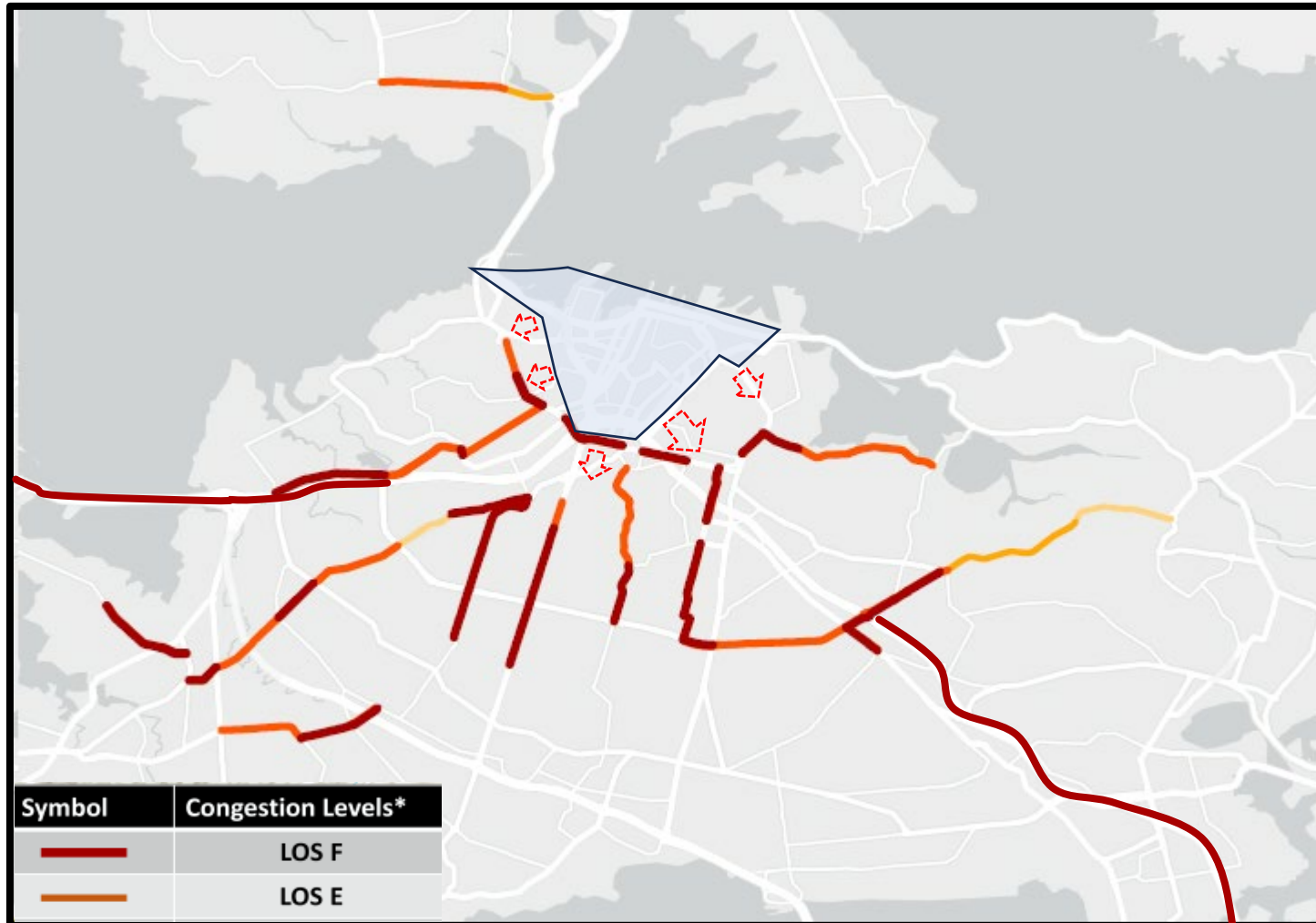
- Will cause diversion and rat running.
- Likely to create equity issues.
- Includes many routes where there is no feasible alternative so may be punitive for many travelers.
- A scheme of this type has not been tested in previous work.

Recommendation

- This scheme has been included on the recommendation of the AT Board (DDC).

City Centre Cordon Stage one proposed by 'The Congestion Question'

Illustrative only – TCQ cordon **plus fringe suburbs**



Pros

- Most feasible and publicly acceptable to implement, due to relatively small geographic area and availability of alternative travel options
- Does not include the worst congestion areas, but will still reduce congestion on key routes approaching city centre

Cons

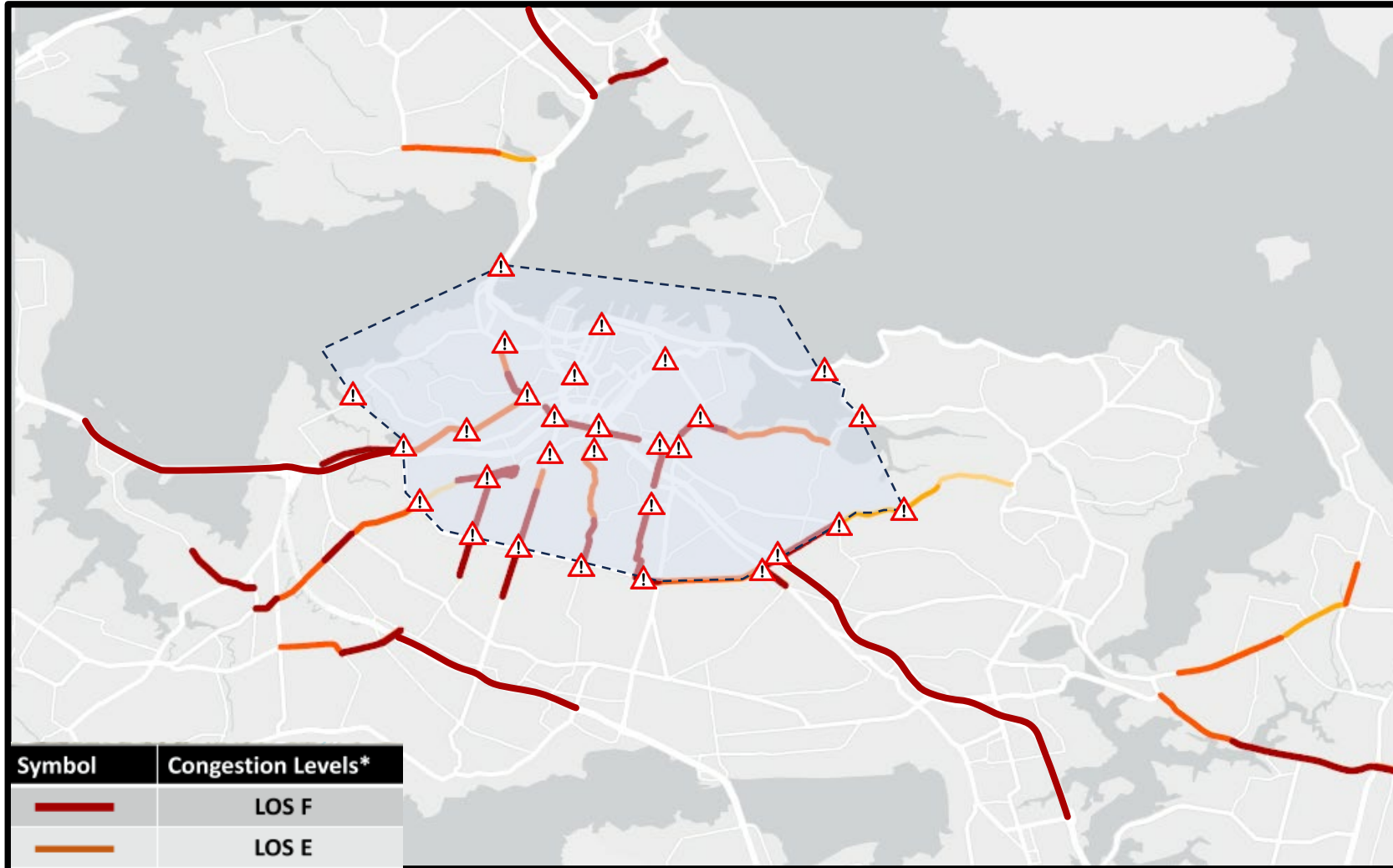
- Relatively modest impacts at a regional scale, despite the concentration of trips into the city centre – hence a need to investigate other options with larger scale impacts.
- The city centre cordon can be combined with other options, including corridor options

Recommendation

- City centre cordon option is taken forward to the next stage as the minimum viable option
- More work is needed to identify the specific cordon location – e.g. city centre, or city centre and fringe

Inner Isthmus Area Strategic Corridors Stage two proposed by 'The Congestion Question'.

Illustrative only – TCQ Strategic Corridors stage two



Pros

- Targets travel into and within the inner isthmus area by charging strategic corridors at key locations to pick up most longer trips
- Includes many of the most congested arterials and will have larger congestion reduction impacts, including on the motorways approaching the area

Cons

- However, the scheme will be more complex to implement, includes some areas that are less well served by public transport and will create more boundary issues at the edge of the cordon

Recommendation

- We recommend taking forward as an option for a larger scheme

