

Queenstown Road Pricing Proof-of-Concept Study



Executive Summary

As one of New Zealand's fastest-growing regions, the transport system in the Whakatipu Basin is experiencing increasing pressure. This is particularly noticeable on the main corridors leading into Queenstown. With the population expected to double in the next 30 years, along with an 80% increase in housing and 45% increase in employment, it is essential that the transport network can meet current and future demands.

The transport challenges facing the District are well known. Significant work has been undertaken over the last decade which has increased our understanding of both the problems with the existing transport approach, and the benefits of ensuring a functional transport network into the future. Most recently, the separate Queenstown Public Transport and Travel Demand Management studies have updated the evidence base, as well as helped refine our understanding of the proposed solutions. These include:

- Delivery of the Queenstown Package as part of the Roads of Regional Significance Programme
- Implementation of the Queenstown Public Transport Business Case Preferred Option
- Implementation of the endorsed Queenstown Travel Demand Management Preferred Option

This work has also identified a clear deficit between what the infrastructure and public transport improvements can deliver, and what is required to maintain acceptable network function. Additionally, while the component parts of the solution have been identified, funding to deliver these is still uncertain. One approach to help address this deficit, under consideration in both Auckland and Tauranga, is road pricing.

While it is noted that there is no enabling legislation, nor an existing policy framework for such a scheme, the Government Policy Statement on Land Transport (GPS) states *"We are initiating policy work to determine the tools required to meet our future revenue needs and provide a predictable and sustainable revenue outlook. This is likely to include road pricing alternatives, time of use charging and the transition of all vehicles to RUC¹".*

This Proof-of-Concept (PoC) study was undertaken to help understand how road pricing may support the direct and indirect aims of Queenstown Lakes District Council (QLDC), and partner organisations' transport objectives.

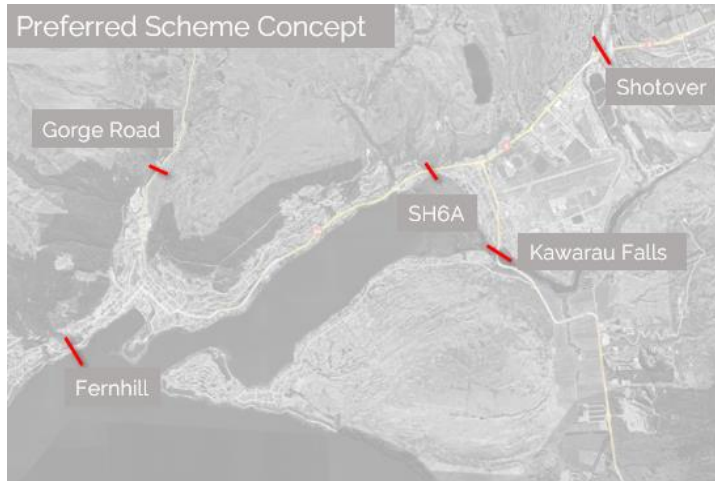
As a PoC study however, the purpose of this analysis was for conceptualisation and framing only. It does not constitute Council policy nor indicate an acceptance to implement road pricing in the District.

The development of the PoC began with a consideration of its primary objective. While a range of objectives such as supporting economic growth, financing transport projects or lowering carbon emissions were considered, the stakeholder group agreed that improving the performance of the transport network should be the primary objective. This is not to say that other objectives were not important or considered, but rather that in the development of a road pricing scheme, clarity of purpose is required to ensure a focused approach. Additional factors should be considered *if* the overall PoC is to be developed further. This is also why the analysis was limited to transport benefits and/or costs, and not wider matters such as equity or environmental impacts. While important, they were out of scope for this study.

After considering various options a five-gate scheme, shown in Figure 1-1, was confirmed as the preferred concept. Gate locations reflected key network locations where reductions in total vehicle movements would help maximise the network optimisation goals, while also reflecting ease of implementation and access to suitable alternative travel choices such as public transport.

¹ Government Policy Statement on land transport 2024-34, New Zealand Government (June 2024)
<https://www.transport.govt.nz/assets/Uploads/Government-Policy-Statement-on-land-transport-2024-FINAL.pdf>

As a PoC, a first-principles approach to modelling the scheme concept was undertaken, applying international demand elasticity values² as well as comparisons with overseas road pricing schemes.



The analysis found that an indicative modelled charge of \$5 at peak times and \$2 during the daytime interpeak period would cause a substantial reduction in traffic volumes and travel times along SH6A and SH6 (South), as shown in Table 1.

From a network operations perspective, these are significant benefits and would materially improve overall network performance. Direct outcomes include **faster and more reliable journey times for users, as well as enhanced economic efficiency and productivity.**

Figure 1-1 Preferred Scheme Concept

Table 1 Summary of benefits

Time Period	Impact on Traffic Volume (SH6A)	Impact on Travel Times (SH6A)	Impact on annual PT Patronage	Estimated annual revenue
AM Peak	8 - 14% reduction	18% reduction	Increase by 170,000 - 250,000 boardings	≈ \$22 million
PM Peak	7 - 12 % reduction	20% reduction		

People who need to travel by vehicle – e.g., those in freight, home care nursing or tour coach industries – would spend less time delayed in congestion, with greater travel time reliability enabling them to service more locations than would otherwise be possible. Similarly, tourists, who may be in the district for only a short period of time, would be able to visit more destinations.

These figures are based on a modelled 2023 year and should also be considered highly conservative. If traffic volumes continue to increase based on current trends, along with the additional residential and commercial development which is forecast, the potential benefits from a road pricing scheme would be greater.

An additional positive outcome of such an approach is the estimated increase in public transport patronage. Increasing patronage will help further drive service improvement such as more frequent services, which will encourage ridership. While this may increase operating costs, this could be offset if the net revenue generated was hypothecated to transport improvements, and this was an approach that the stakeholders endorsed.

The study also highlighted the importance of ensuring public participation for any discussions regarding a pricing approach. While the community is currently experiencing the impacts of congestion, there appears to be a gap between the public understanding of the issues and the types of solutions that are required. Careful consideration of this engagement approach and how it should be delivered is essential.

Overall, this study has confirmed that a road pricing scheme has significant potential to reduce congestion, improve travel times and increase the uptake of alternative modes, particularly public transport in the District. Based on this analysis, it appears that road pricing is feasible and further investigation is recommended.

² Elasticity in this context refers to the percentage change in trips that can be expected due to a 1% increase in costs.

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Appendix A. Level of Service

Queenstown Road Pricing Study - Summary Report

Quality Assurance Information

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1. Introduction and Project Objectives

The Whakatipu Basin is one of New Zealand's fastest growing areas, driven by population and employment growth as well as the tourism industry. This growth is placing increasing pressure on the infrastructure, especially the land transport system. Traffic on the main corridors leading into Queenstown is already experiencing congestion, and this is expected to worsen significantly with the expected near doubling of population (both visitors and residents) in the wider area by 2053. Various transport and land development measures are underway or planned to alleviate this issue, but they require significant shifts in behaviours and there are significant funding challenges.

Road pricing provides a strategic option to address this challenge as it can influence travel demand and contribute to other objectives such as supporting land use, community wellness and economic growth, depending on the scheme design.

Queenstown Lakes District Council (QLDC), as part of the wider Way to Go³ group, commissioned this analysis to understand how road pricing may support the District's transport objectives.

From the outset the focus of the study was on collaboration and consensus building among the stakeholder group. The aims of the project were to:

- ✓ Collaboratively determine the objectives for a road pricing scheme in the Whakatipu basin,
- ✓ Develop the principles around which a road pricing scheme could be framed,
- ✓ Achieve stakeholder consensus as to a preferred approach.

The desired outcome of the study process was to bring stakeholders to a common understanding about the potential benefits and costs of road pricing in Queenstown, and to utilise the expertise and insights of the stakeholder group to support critical thinking and develop a context-appropriate solution for the area. This enabled the development of a Proof of Concept (PoC) road pricing scheme accompanied by a high level to determine likely transport benefits and wider impacts.

As a Proof-of-Concept study however, the purpose of this analysis was for conceptualisation and framing only. It does not constitute Council policy, nor indicate an acceptance to implement road pricing in the District.

1.1 Stakeholders

The PoC was developed through a facilitated stakeholder group process comprised of officers from QLDC, Otago Regional Council and NZ Transport Agency Waka Kotahi. All members of the group are also either residents of Queenstown and/or have significant experience in the District and understand the challenges being faced.

As part of the process stakeholders were also to consider the overall approach from the perspective of different user personas. These personas, with examples shown in Figure 1-1, developed as part of previous market research engagement into transport issues within the District, represent different user requirements and helped ensure a broad consideration was applied to the development of the PoC. In addition to those shown in Figure 1-1, specific focus was also given to the needs of other representative users e.g., the freight community.

This approach has ensured that the emerging PoC can help further discussion and consideration of road pricing in the District, without constraining its further development.

³ The Way to Go partnership involves the QLDC, NZ Transport Agency Waka Kotahi and Otago Regional Council and recognises all three agencies have a role in providing for an enduring, safe and affordable transport system, which also provides you with transport choice



Figure 1-1 User Personas

1.2 Study Limitations

Being a conceptual study, limitations were placed on the scope as follows:

- Learnings and analysis from overseas road pricing schemes, previous New Zealand road pricing studies and Queenstown business cases were used to inform the study, rather than substantial new research, surveys or analysis being undertaken.
- The scheme concept and modelling approach was designed to assess the key potential transport outcomes of a road pricing scheme. Other aspects, such as environmental or equity impacts, while important, have not been assessed.
- The scheme concepts developed in the study are intended to inform future investigations only i.e., the proposed scheme is not to be assumed for implementation.
- The absence of enabling legislation or supporting policy means assumptions have been made about how a scheme may operate. Any proposed legislation may or may not support a scheme similar to that indicated by this study. Based on the direction indicated in the GPS, the study has considered a time-of-use pricing approach.
- Analysis of travel impacts is indicative only, consistent with the proof-of-concept nature of the study. Detailed transportation modelling is recommended if road pricing is to be investigated further.

2. Background

2.1 Queenstown Transport Context

Queenstown is experiencing a challenging transport situation due to its rapid population and economic growth which is forecast to continue alongside a physically constrained transport network. This problem is well-recognised, and has been studied at length as part of recent analyses:

- Queenstown Business Case (QBC, 2021)
- Queenstown Public Transport Business Case (QPTBC, 2024)
- Queenstown Travel Demand Management Single-Stage Business Case (TDM, 2023)

The Queenstown Business Case identified that the practical capacity of SH6A was exceeded on approximately 140 days in 2019⁴. Modelling as part of the business case process indicated that congestion and a poor level of service is expected to be widespread by 2028, with travel times for Lake Hayes Estate to Town Centre trips regularly exceeding 60 minutes. The resident and visitor growth forecast from this business case is shown in Figure 2-1.

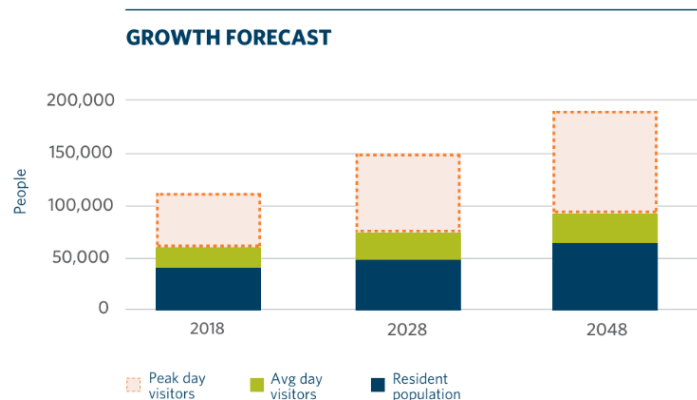


Figure 2-1 Queenstown Growth Forecast (QBC)

Analysis undertaken as part of the present study confirms the findings of the QBC. Figure 2-2 shows the current estimated volume to capacity ratios on key links of the Queenstown network, estimated from NZTA Traffic Monitoring System (TMS) vehicle counts recorded from January to December 2023. These results show typical weekday congested periods extend approximately from 6.00am – 6.00pm near the Town Centre, and from 12.00pm – 6.00pm at the SH6 / SH6A roundabout approaches.

There are a range of current and planned investments intended to address these transport challenges as part of the remaining works for the Queenstown Package⁵, including the recently re-confirmed funding as part of the Roads of Regional Significance Programme in the District. The Queenstown Public Transport Business Case Preferred Option represents a significant step change in public transport (PT) provision for the Whakatipu basin. The QBC and QPTBC both identify increases in public transport use as key to improving productivity and people capacity along the constrained key corridors in Queenstown. However, analysis as part of the business case work also indicated that the public transport improvements alone will be insufficient to maintain an acceptable transport network level of service in the future.

Failure to reach desired levels of mode shift to public transport will restrict the capacity and performance of the network, especially as PT services largely run on the same congested network as general traffic. The current analysis suggests that with only limited PT priority measures, there is a risk

⁴ Queenstown Business Case – Summary Report, NZTA, <https://www.nzta.govt.nz/assets/projects/queenstown-package/5ab-queenstown-business-case-summary-report.pdf>

⁵ <https://www.nzta.govt.nz/projects/queenstown-package/>

that a sustained mode shift will not be achieved though “pull” measures (such as improved PT services) alone.

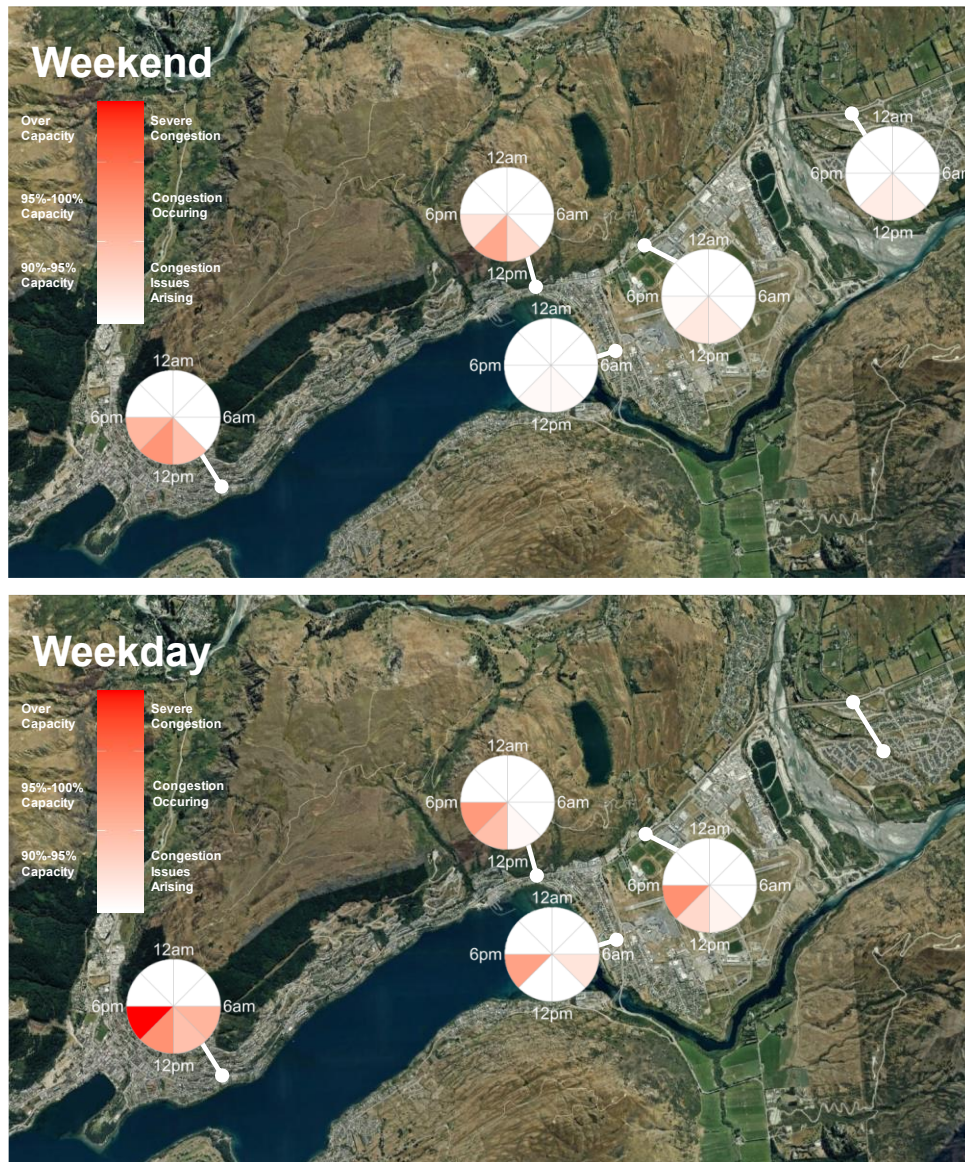


Figure 2-2 2023 Queenstown Road Network Utilisation

2.2 Road Pricing

Road pricing is an umbrella term referring to charging motorists for access to, or passage through, certain roads or areas. In general, road pricing is enacted to achieve a primary objective, such as revenue generation, congestion reduction or environmental benefits. Charging for access to roads encourages existing motorists to consider alternatives such as public transport, active modes, reducing travel, shifting trip timing, and combining trips. The term time-of-use charging is sometimes used to specifically refer to road pricing where charges vary by time, such as in schemes aiming to address peak congestion.

Types of Road Pricing

There are three common forms of road pricing that are applied:

- 1) *Zonal* schemes charge for accessing a particular zone e.g., London Congestion Charge.
- 2) *Corridor or link* schemes charge for the use of a road corridor, including typical toll roads. E.g., Singapore's Electronic Road Pricing (ERP) system (Figure 2-3) or the Tauranga Eastern Link Toll Road.
- 3) *Distance-based* schemes charge based on distance travelled, ranging from simple flat-rate charging (e.g., New Zealand Road User Charges) to a dynamic or place-based variable charge.



Figure 2-3 Electronic Road Pricing (ERP) gantry

Methods of setting charges vary based on the objectives of a road pricing scheme. Prices may adjust across the day to target times of greatest demand, or simply apply as a flat fee. Schemes typically use camera-based automated number plate recognition (ANPR), radio frequency identification (RFID) smart tags or Global Navigation Satellite System (GNSS⁶) based technology to identify vehicles and any applicable charges.

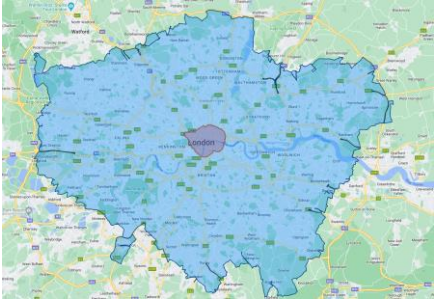
International Road Pricing Examples

Some examples of existing road pricing schemes are shown in Table 2.1. While many different cities apply road pricing, the schemes listed have a focus on congestion reduction (as opposed to revenue generation or infrastructure cost recovery).

Comprehensive road pricing schemes exist in London, Milan, Stockholm, Gothenburg, Oslo, Singapore as well as in various US highways/jurisdictions. In Norway, "toll rings", with higher tariffs at peak times, exist even in small cities such as Bergen (population 270,000), Trondheim (180,000), Tromsø (65,000) and Haugesund (36,000).

⁶ GNSS is the industry accepted umbrella term for satellite navigation systems. While commonly interchangeable with the term GPS (Global Positioning System), GPS is singular, proprietary system, whereas GNSS applies across all satellite-based systems.

Table 2.1 Examples of road pricing schemes

Scheme	Description
London Congestion Zone 	- Objectives: Reduce congestion, fund transport improvements - Charges apply 7am – 6pm weekdays / 12pm – 6pm weekends - Flat charge of £15 (90% resident discount, mobility badge holders exempt) - ANPR technology - World-leading when introduced, now considered less fit for purposes – an estimated 50% of circulating traffic is exempt from the charge (including electric vehicles, although this will end in 2025)⁷.
High-Occupancy Toll (HOT) Lane Various United States locations  https://en.wikipedia.org/wiki/High-occupancy_toll_lane#/media/File:I-15_Express_Lanes.jpg	- Objectives: Optimise lane usage and generate revenue from spare highway capacity - Express toll lanes with dynamic price (real time updates) set to maintain a desired free-flow speed - Drivers may enter the express lane at points along adjacent free lane(s) - High-occupancy vehicles generally exempt from charge - Expected travel time saving clearly communicated to potential users - Either pay-by-plate or RFID tag charge technology
Singapore Electronic Road Pricing (ERP) 	- Objectives: Optimise network performance and traffic flow - Charging gates on key links throughout the city, including a cordon formed around the city centre - Charges vary by time of day and gate, according to a published schedule – clear link between charges and level of service - Charge schedules reviewed quarterly to achieve target 15th percentile speed⁸: 45-65 km/h on expressways, 20-30 km/h for local streets - Charges are collected via an in-vehicle GNSS unit (including for motorcycles)

⁷ The Congestion Question – Technical Report, July 2022

⁸ Singapore's Experience with Road User Charges, Presented at ITF-OECD Workshop *International Best Practices to Promote Eco-Friendly Cars* 25-26 January 2021

New Zealand Examples

Road pricing has been used in various forms across New Zealand with the most notable being the Auckland Harbour Bridge toll which operated between 1959 and 1984, and the Lyttelton Road Tunnel which was tolled between 1964 and 1979.

At present, three toll roads currently operate: the Northern Gateway Toll Road (north of Auckland) and the Tauranga Eastern Link and Takitimu Drive Toll Roads (both in Tauranga). These toll roads only exist where there is a free, alternative route (albeit less direct) and the revenue is used to contribute to their construction, operation and maintenance. Charges range from \$2.10 - \$2.60 for light vehicles including motorcycles and \$5.20 - \$5.60 for heavy vehicles (>3500kg)⁹.

In addition, the nationwide Road User Charges (RUC) programme is also a distance-based road pricing scheme and was instituted to ensure non-petrol¹⁰ based vehicles e.g., diesel powered (and more recently electric) vehicles contribute to the funding and operation of the road network.

Current Investigations

Auckland

Auckland Transport, at the direction of Mayor Wayne Brown, and in conjunction with Auckland Council, has been looking at a road pricing scheme since late 2023. This work is based on a previous study led by the Ministry of Transport, which found that congestion charging / time of use charging would be an effective way to reduce congestion in the City. The current emerging options involve a City Centre Cordon, as well as charging on Strategic Corridors and/or other highly congested locations i.e., zonal and corridor charges. The proposed primary scheme goal is travel demand management, aiming to increase road corridor productivity¹¹. While no specific tariffs have been identified, the scheme would seek to achieve a 10% improvement in corridor performance. Based on previous analysis, it is expected the tariff would be between \$3.50 and \$5.00. While legislative changes would be required before any scheme is introduced, if permitted, AT is proposing to commence implementation in 2025 with the scheme operation by mid-2026. is seeking operation from 2026

Tauranga

The *SmartTrip* study, a partnership between Tauranga City Council and NZTA, developed a variable road pricing scheme concept as a potential solution to congestion issues in Tauranga. The scheme would replace existing toll charges on the primary motorway network with a variable access and distance-based charge, increasing at peak times. The proof-of-concept study estimated a 20% reduction in vehicle delays, 6% increase in uptake of alternative modes and 5% reduction in emissions. Despite Tauranga already hosting the only urban toll roads in the country, community response to the SmartTrip proposal was largely negative and the Tauranga City Council Commission elected to pause development of a business case pending further community engagement.

Legislative Status

There is currently no enabling legislation in New Zealand to allow a local authority to implement road pricing – all existing tolls are on the State Highway network operated by NZ Transport Agency Waka Kotahi. However, the Government Policy Statement on Land Transport (GPS)¹² states:

The next steps include requiring all road vehicles to move from FED [Fuel Excise Duty] to RUC [Road User Charges], which is a fairer way of charging for road use based on weight and distance. As part of these reforms, we will reform tolling legislation and allow for time-of-use

⁹ <https://www.nzta.govt.nz/roads-and-rail/toll-roads/toll-road-information/where-the-toll-roads-are/>

¹⁰ Petrol powered vehicles pay their road user charges through a levy collected as part of the price of petrol.

¹¹ <https://at.govt.nz/media/v3ekw5z/13-time-of-use-charging-programme.pdf>

¹² <https://www.transport.govt.nz/assets/Uploads/Government-Policy-Statement-on-land-transport-2024-FINAL.pdf>

charging on the most congested parts of New Zealand's road network, helping to reduce congestion and maximise use of existing assets (pg8).

[...]

Tolling provides an opportunity for an additional source of revenue and will support infrastructure which provides reduced travel times compared to alternative routes. Time of use charging will improve travel times and network performance, reducing overall costs for freight businesses and their customers (pg10).

[...]

We are initiating policy work to determine the tools required to meet our future revenue needs and provide a predictable and sustainable revenue outlook. This is likely to include road pricing alternatives, time of use charging and the transition of all vehicles to RUC (pg26).

While there is clear direction from Government that road pricing (especially time-of-use charging) will form part of future transport strategy, the details of the expected legislation are not known. In particular, it is not known whether road pricing will be allowed or supported outside of larger urban areas. Further detail is expected in the third quarter of 2024, as Cabinet decisions on time-of-use charging legislation form part of the Government's published 40-point action plan.

Time-of-Use Charging

As noted above, changes to tolling legislation have been indicated by the Government, with a particular focus on *time-of-use charging*. Time-of-use charging involves applying variable tariffs at different times, typically in a manner that maximises network benefits while minimising unnecessary costs to users. For example, peak time tariffs, implemented when the road network is most congested, maintains a focus on network operation, with the tariff reduced (including potentially to zero) during the interpeak or off-peak periods.

Time-of-use charging to reduce road congestion is an efficient way to manage demand on the transport network. From a technical perspective, these charges internalise the congestion and delay costs that road users impose on other traffic, and monetise time otherwise spent inefficiently queuing for access to capacity-constrained parts of the transport network. Any revenue generated, once operational costs are met, can be used to deliver wider community benefits, including to those potentially disadvantaged by the introduction of road pricing, such that a well-designed scheme should produce net societal benefits.

Time-of-use charging is already widely employed to manage network capacity in other areas. Electricity prices vary near-continuously (every 30 minutes) to reflect the cost of supply and manage excess demand, with wholesale prices ('spot prices') set to reduce the need for expensive peak generation and grid capacity. While traditional household electricity plans offered peak and off-peak rates, recent advances in smart metering have enabled options that allow users to pay with a variety of tariff schedules including rates directly tied to wholesale spot prices. This encourages users to reduce their power usage at peak times and shift their demand to alternative periods where there is excess grid capacity.

Other examples include public transport systems which use cheaper off-peak fares to encourage trips away from peak times and make use of spare capacity in the system. Similarly, ride-share schemes, such as Uber, apply higher "surge" prices in periods of high demand to ensure that rides are readily available when needed.

3. Methodology

As a proof-of-concept, with a focus on scheme conceptualisation and framing, a targeted methodological approach was taken, leveraging the knowledge and experience of the stakeholder group, combined with a first-principles approach to modelling. The aim was to understand the potential for road pricing to support the benefits sought in the Queenstown transport package, while also upskilling the identified stakeholders on road pricing in the Queenstown context.

The methodology was structured around four stakeholder workshops which considered different aspects of scheme development, understanding and analysis.

Workshop 1 – Scheme Objectives

The purpose of Workshop 1 (WS1) was to discuss and agree a primary objective for a pricing scheme, alongside any secondary objectives, and the parts of a network that a scheme could apply to. This workshop also provided background information on road pricing, the Queenstown context and how it can support transport and network objectives, potential challenges and pricing examples.

Workshop 2 – Scheme Concepts

Building on WS1, the second workshop focused on collating different ideas on scheme concepts, including indicative prices, geographic coverage, and wider network impacts.

Workshop 3 – Complementary Measures

Based on the outcomes from WS1 & WS1, stakeholders were asked to agree a preferred scheme for further analysis as well as identify any complementary measures that may be required to support the overall objectives. Initial discussions were also had regarding other potential impacts such as on equity or accessibility and their mitigations.

Workshop 4 – Future Proofing and Next Steps

The last workshop focused on wider considerations such as how the emerging PoC scheme could be future proofed and potential next steps.

The workshops were complemented by supporting technical analysis and/or the provision of background material to facilitate discussion and understanding. Interactive tools were used extensively to draw out and record stakeholder views. Further concept analysis and investigation between workshops was also undertaken to inform subsequent discussions.

It should also be noted that while the above methodology provides a linear overview of the process, significant iterative activity was undertaken whereby stakeholders were asked to reconsider and review findings from previous workshops. This helped ensure a continual refinement of the PoC occurred through the study.

4. Concept Development

The concept development process involved:

- Principle & objective setting,
- Scheme conceptualisation,
- Concept analysis,
- Preferred scheme identification,
- Discussions of complementary measures.

4.1 Principle & Objective Setting

Successful road pricing schemes require clarity regarding the principles and objectives that can inform the development and delivery of any proposed scheme. As part of WS1, stakeholders were asked to discuss and identify the principles and objectives that should be considered for a Queenstown scheme.

The development of clear and consistent principles has a crucial role in informing the framing of a road pricing scheme by providing a foundation for decision-making and ensuring that the design and implementation of any scheme is done in an efficient and effective manner. Following a discussion about the different principles that could be applied, the stakeholders were asked to consider and rank different identified principles. Figure 4-1 shows the results of the stakeholder rankings, with a clear finding that any road pricing scheme should be “targeted”, “user-centric” and “legible”.

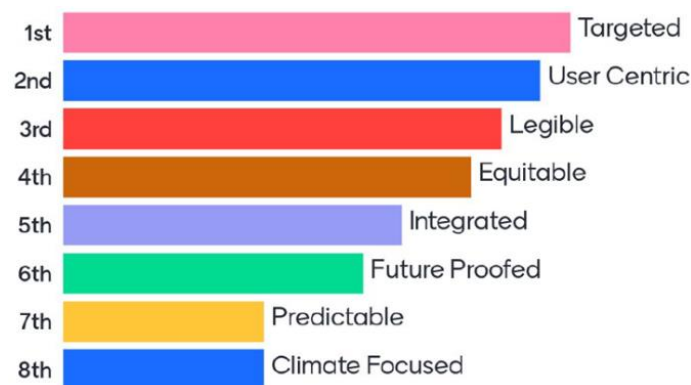


Figure 4-1 Stakeholder Rankings of Road Pricing Principles

In contrast to the principles, the objectives provide the key, measurable purposes that a scheme could seek to achieve. They can also be split into primary and secondary objectives. The objective setting process followed the initial presentations around the Queenstown context and transport challenges being faced. Subsequently the discussions focused on what objectives a road pricing scheme should seek.

Figure 4-2 shows the stakeholder rankings for the primary and secondary objectives. The highest-ranked primary scheme objective was to “improve performance of network”, with “incentivise travel choice” ranked second-highest. Few stakeholders thought that carbon emissions reductions, air pollution or road safety were key objectives. The highest-ranked secondary objective was to “finance transport projects”, with “support urban form outcomes” and “support economic growth” second and third ranked.

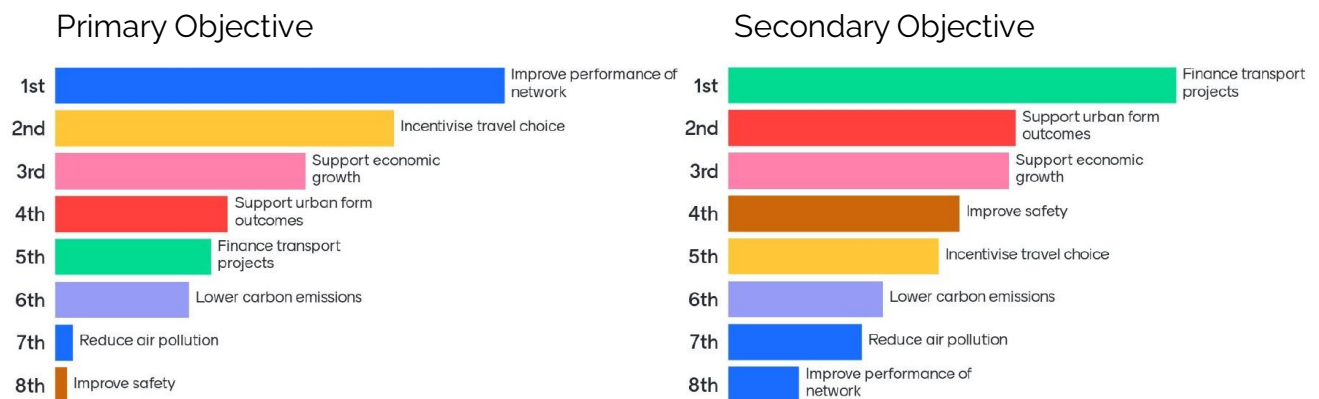


Figure 4-2 Stakeholder Rankings of Road Pricing Objectives

As an objective, improving network performance was defined, at a high level, to encompass:

- Prioritising high value trips such as those for business purposes (non-commuter) such as goods and service purposes e.g., time sensitive food deliveries
- Trip amalgamation – encouraging drivers to avoid unnecessary duplication of activity and distances travelled
- Encouraging modal choice – supporting wider behaviour change activity e.g., encouraging public transport for commuter trips or active travel for other trips
- Trip shifting – encouraging drivers to reconsider trip timing away from the peaks whenever possible

More specifically, this analysis considered network performance as a function of the *level of service* for users of the network. *Level of service* is a technical transportation term describing congestion and movement conditions for a transportation link or intersection. Desirably, traffic would be able to move through a network without excessive delay, however as congestion increases, delays and therefore the level of service deteriorates. For further detail, please see Appendix A1.

Road Pricing Alignment With QLDC Vision

As part of the discussion around the Queenstown context and road pricing principles and objectives, the stakeholder group also considered how road pricing would fit in overall with the vision and wider policies in the District. Subsequently it was agreed that road pricing is just one mechanism by which Council's vision can be achieved, as illustrated by Figure 4-3. In this framing, road pricing is just “one tool in the toolbox” alongside other travel behaviour change activities such as parking management or Travel Demand Management programmes such as business engagement. It should not be considered as *the* solution, but rather part of the solution.

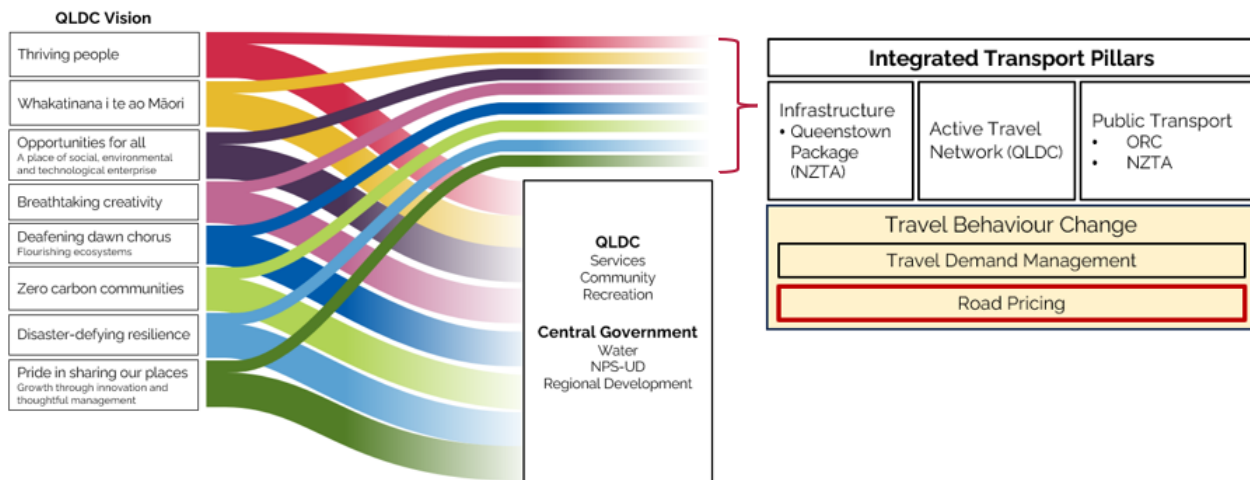


Figure 4-3 Road Pricing Strategic Alignment

4.2 Scheme Concepts

Based on the expressed views of the stakeholders, and the proof-of-concept nature of the study, network optimisation was taken forward as the primary objective of the concept road pricing scheme to be developed. Equity concerns, and mitigations to address these, were discussed in the workshops but were not the primary focus of the scheme development.

Concept Development

As part of WS2, participants were asked to individually develop a scheme concept to address either the agreed primary objective - improving network performance, or the secondary objective – financing transport projects. This approach was taken to generate the broadest range of potential schemes with consideration of:

- Geographic coverage and charging approach e.g., should it be a gate, cordon, corridor
- Indicative maximum charge, if any, by period (AM/interpeak/PM) and weekday/weekend

The generated scheme concepts were then organised into themes and condensed into six schemes with varying scope and approaches. Where insufficient stakeholder support was identified, such as for weekend charging, this was then removed as part of the PoC consideration.

Further analysis was undertaken on the six initial concepts, and in agreement with the client representatives, three concepts were agreed for further analysis.

- **Concept A: SH6A Gate**

This concept would apply a single bi-directional gate on SH6A (east of Marina Drive). Vehicles would be charged when crossing this gate in either direction. This approach would address the SH6A congestion, and would be simple to implement, although would provide only limited benefit for SH6 to the south and east. However, the presence of an un-tolled route to the Town Centre via Gorge Road¹³ would likely result in increased vehicle movements on this corridor.

- **Concept B: Multiple Gates**

This concept extends Concept A to include gates at Gorge Road, Fernhill, Shotover and Kawarau Falls Bridges. Vehicles would incur the toll when crossing the gates in either direction, with a maximum of one charge per trip. This concept effectively targets wider congestion on the network, as it includes SH6 south and east, as well as traffic from Arthurs Point, although has

¹³ As a PoC, other network constraints, such as the Edith Cavell one-lane bridge, were not specifically assessed.

limited impact on trips within the Town Centre or from nearby areas such as Goldfield Heights.

■ **Concept C: Multiple Zones**

This concept includes charging zones covering the wider Town Centre and Frankton areas. Vehicles are charged for any travel within these zones with a maximum of one charge per trip. In practice this could involve ANPR cameras located throughout the zones and in similar locations to the gates in Concept B. This concept has higher complexity than a gate-based approach, but more effectively targets congestion trips within, and adjacent to, the Town Centre and Frankton.

Figure 4-4 shows the agreed short-listed scheme concepts. The proposed tariff structure is the same for each of the scheme concepts.

While the technology required for scheme implementation is expected to be determined as part of any legislative approvals process, for simplicity, it has been assumed that automatic number plate reader (ANPR) technology would be implemented. This is also consistent with existing NZ Transport Agency Waka Kotahi toll road infrastructure.

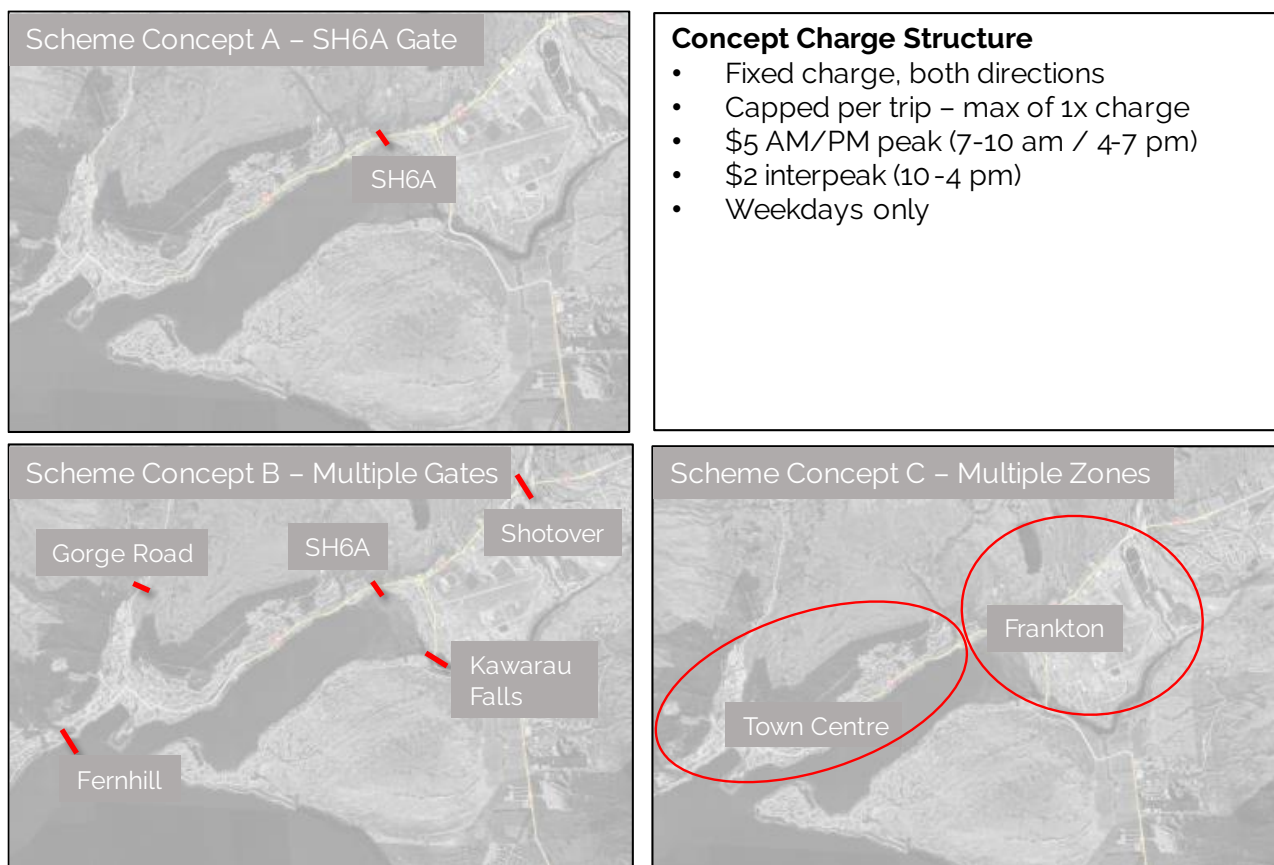


Figure 4-4 Scheme Concepts

Tariff Setting

The stakeholder discussion on a potential tariff structure was relatively high-level, however stakeholders were asked to consider what would be an appropriate fee threshold for modelling purposes. In simple terms, the higher the proposed fee, the greater the expected change in driver behaviour is expected. With a network optimisation objective, comparisons were made with different example price points e.g., a \$2 bus fare, estimated vehicle running costs between Frankton &

Queenstown of around \$3¹⁴, Queenstown hourly parking rates of \$2 - \$6/hr, as well as service rates such as late fees at an early childhood education facility (\$20 per 20 minutes) or a plumber fee (\$80 - \$90/hr).

For modelling purposes, it was agreed that a starting rate of \$5 would be appropriate, noting that if the scheme was to be progressed more refined modelling would be needed. In practice, it is assumed that a variable tariff schedule would be applied across different time periods reflecting the overall demands on the network.

4.3 Concept Analysis

The three scheme concepts were analysed to assess traffic volume, travel time, mode share and revenue implications using actual traffic data from 2023.

A high-level elasticity-based approach, in accordance with the NZTA Monetised Benefits and Costs Manual (MBCM) was used to estimate reductions in traffic using because of road pricing. This was supplemented by arc elasticity values taken from Swedish studies of congestion charges, and is a similar approach that was used inform analysis for *The Congestion Question*¹⁵ report looking at road pricing in Auckland. Peak elasticities from Gothenburg and Stockholm (Table 4.1) form the low and high elasticity bounds used in the analysis. As a conservative approach, and to reflect potentially fewer feasible alternatives to driving in Queenstown compared to Swedish cities, the lower of short- and long-term elasticity estimates from the studies were taken. Baseline trip costs in the Swedish studies were 1.2 times fuel costs, however in this analysis IRD kilometre rates (Tier 2 - variable costs) are used as a proxy for baseline cost.

Table 4.1 Elasticity values used in concept analysis

Study	Baseline Cost	Arc Elasticity
Stockholm Congestion Charge	Fuel cost x 1.2	-0.87 (peak)
Gothenburg Congestion Charge	Fuel cost x 1.2	-0.69 (peak)

Baseline travel patterns (origin – destination) and volumes were estimated based on TomTom data, calibrated to NZTA Traffic Management System counts for major links, for the period from September to November 2023. The estimated reductions in traffic were then calculated based on the relative change in trip cost between an approximate base cost per origin – destination pair and the modelled road pricing charge.

TomTom travel time data for key state highway links is used to assess the impact of traffic volume reductions on travel time. Travel times for a given traffic volume level are estimated using a regression of traffic volumes by hour of the day against both median travel time and the ratio between 90th percentile and median travel times.

Approximate baseline public transport mode share was sourced from the Queenstown Public Transport Business Case PT trip estimates and TMS traffic counts, adjusted to reflect the intermediate year of the analysis. Expected new public transport trips are determined using diversion rates from the NZTA MBCM (40% of trip reductions caused by toll charges), scaled per origin-destination pair to account for varying trip lengths and public transport service quality.

Net revenues are estimated assuming a \$0.75c transaction cost¹⁶ per charging event and a nominal 50% reduction in gross revenue was applied to account for potential variable pricing. While this results

¹⁴ Petrol vehicle travelling 7km @ 43c per km (2023 IRD kilometre rates adjusted for fuel price increase) – excludes fixed costs of ownership

¹⁵ *Congestion Pricing Options for Auckland: analysis of distributional effects* (The Congestion Question)

¹⁶ Supplied by NZTA.

in a conservative analysis, for a PoC it minimises any overstating the benefits and reflects that the indicative charge is intended to reflect a peak maximum only, and includes an allowance for non-payment and/or exemptions.

Table 4.2 summarises the key performance indicators for each of the scheme concepts. Figure 4-5 shows detailed travel time and traffic volume changes on key routes. The SH6A Gate concept is expected to induce re-routing via the untolled Gorge Road route, resulting in a larger reduction on SH6A traffic. Significant displacement would be expected to occur onto Gorge Road exacerbating existing capacity constraints on the one-lane Edith Cavell Bridge, however these were not modelled. The Multiple Gate and Multiple Zone concepts achieve similar levels of traffic reduction, although a zonal charge approach more effectively targets trips in the Town Centre.

Table 4.2 Scheme Concept Analysis Summary

Scheme concept	SH6A traffic reduction	SH6A 95 th percentile travel time*	Annual net revenue	VKT change	New SH6A PT passenger trips, peak hour (both directions)	New annual PT boardings
A: SH6A Gate	17-24%	25 → 18 min	\$10m	3-4% increase	70 - 130	170-250k
B: Multiple Gates	10-17%	25 → 20 min	\$27m	6-10% reduction	70 - 130	300-400k
C: Multiple Zones	11-18%	25 → 19 min	\$35m	7-11% reduction	80 - 150	400-900k
* Worst direction, worst peak						

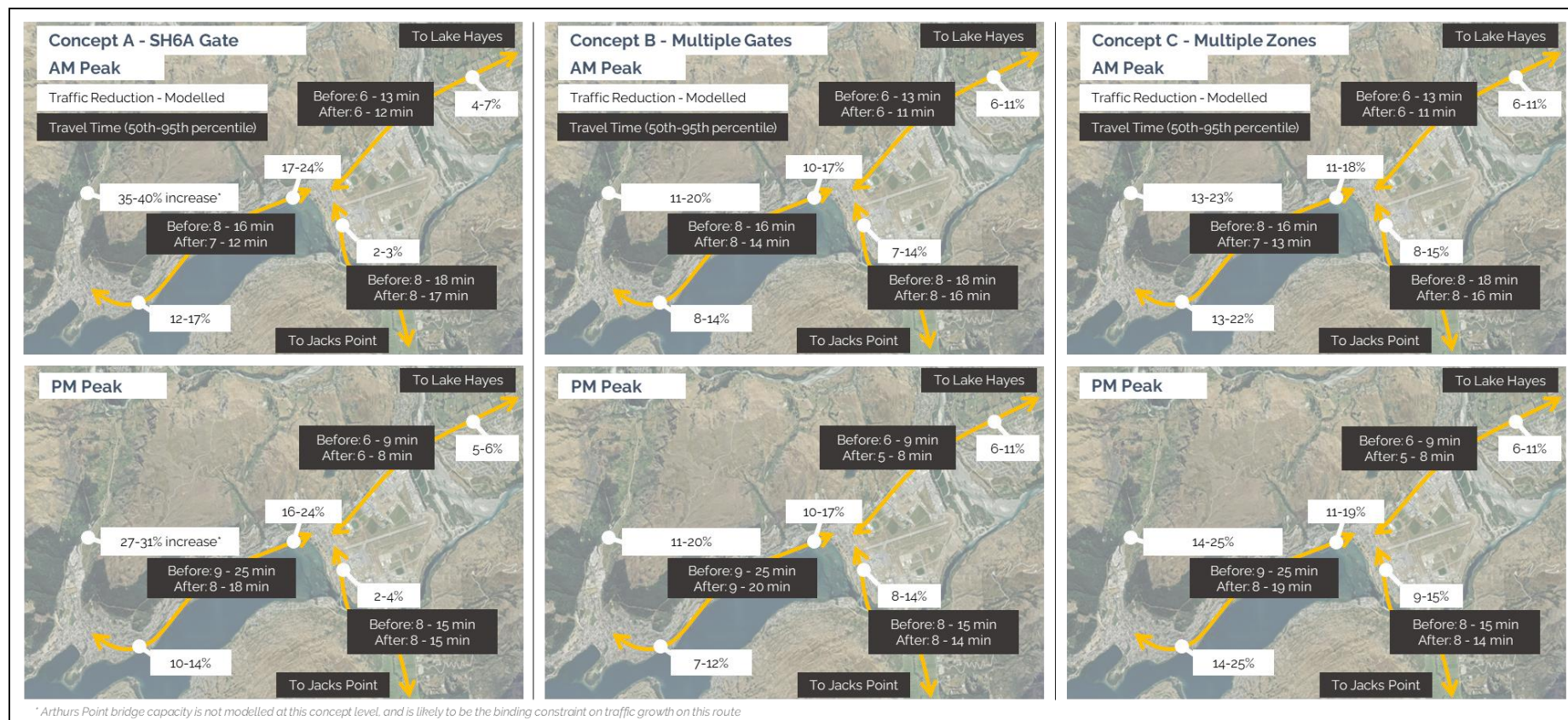


Figure 4-5 Scheme Concept Traffic Volume and Travel Time Analysis

4.4 Preferred Scheme Identification

The three scheme concepts and analysis results were then considered by the stakeholders during WS3. Concept B (Multiple Gates) was the clearly preferred option of a majority of the workshop participants and was taken forward for further analysis. Concept A (Single Gate) and Concept C (Multiple Zones) only received a limited level of support. Concept B was seen to be more targeted, user centric and legible as it provided a consistent approach across the Queenstown Town Centre and Frankton areas.

Further discussion of the Multiple Gates concept with the client stakeholder group confirmed the gate locations as shown in Table 4.3. The preferred concept is shown in Figure 4-6.

Table 4.3 Preferred Concept Gate Locations

Gate Location	Selection Rationale
SH6A (east of Marina Drive)	- Experiences high congestion - Naturally constrained network location (pinch point) - Well serviced by current and planned public transport and alternative modes
Gorge Road	- Prevent trip diversion through Arthurs Point (rat-run) - Legibility and consistency
Fernhill	- Moderate congestion experience on corridor into the town centre - Well serviced by current and planned public transport and alternative modes
Shotover River Bridge	- Experiences high congestion - Naturally constrained network location (pinch point) - Key public transport corridor providing modal choice for journeys
Kawarau Falls Bridge	- Moderate congestion but expected to significantly increase in future - Naturally constrained network location (pinch point) - Key corridor for future PT improvements

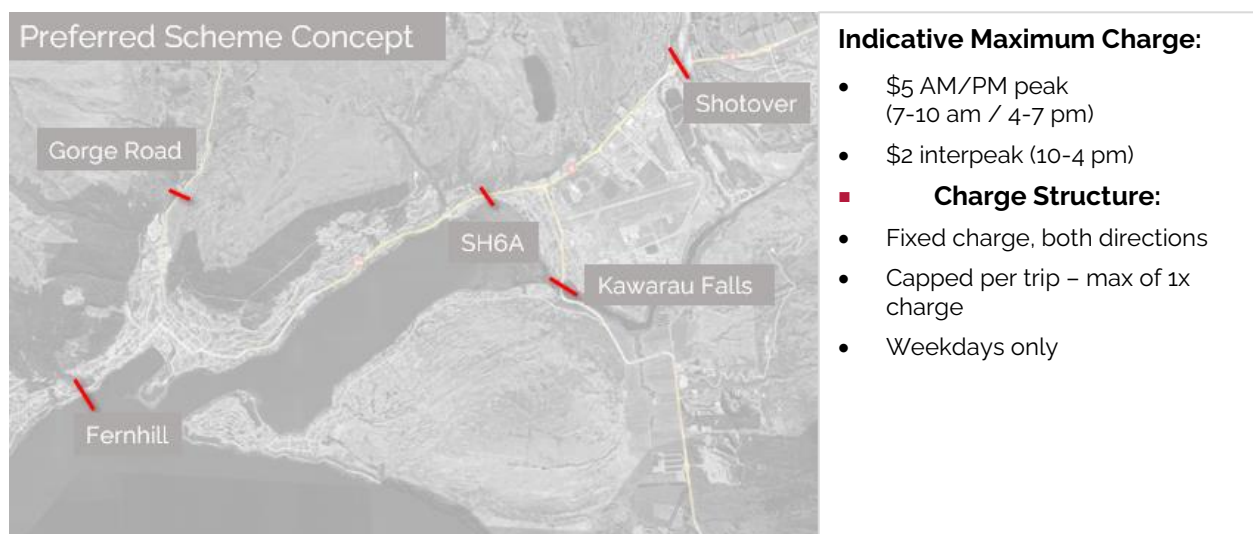


Figure 4-6 Preferred Scheme Concept

4.5 Potential Disbenefits

As shown, the introduction of a road pricing scheme is expected to provide the desired network performance improvements, as well as encouraging the uptake of alternative modes alongside generate net revenue for further investment. However, there are a range of potential disbenefits and costs that also require consideration. It is expected that, if road pricing is investigated further, community consultation is undertaken to understand and mitigate potential disbenefits, such as:

- **Overall user costs:**

While road pricing (particularly time-of-use charging) is expected to lower overall cost for users of the transport system – in terms of time, money and transport choice – some people may face tariffs that exceed the value that they place on faster and more reliable journey times. As such, some users will be negatively affected, particularly those for whom changing their travel time or mode is unfeasible or impractical e.g., shift workers, or those who are required to use a vehicle for work or other purposes. Given that these users will also see benefits from improved network performance, it is important to understand the magnitude of any increases in net cost, particularly in comparison to fixed and variable costs that are already accepted when owning and using a motor vehicle.

- **Equity impacts:**

The five-gate concept avoids disproportionate targeting of one area or population, as most travellers will need to cross at least one gate. However, the current scheme consideration does not specifically assess the impact on households or users with less disposable income, or how these impacts might be mitigated by complementary measures. This was an area of concern for the stakeholders, and further modelling and analysis is recommended if the scheme is to be advanced.

- **Diversion impacts:**

A common occurrence with poorly designed schemes is drivers electing to travel on alternative routes which do not incur a charge. The proposed scheme coverage mitigates this risk by placing gates at naturally constrained network points such as bridge crossings etc. Detailed transportation modelling should be undertaken to identify any diversion impacts if the scheme is investigated further.

Discounts and Exemptions

As a means of mitigating potential disbenefits, consideration was given to what discounts or exemptions, if any, should be applied. While there was general support for their appropriate usage, such as for those with mobility parking permits, it was also noted that these should be kept to a minimum to avoid comprising the objective of network optimisation or introducing additional scheme complexity.

Introducing discounts or exemptions would also be expected to generate additional demands from groups that may not initially receive a discount, and may also result in a higher base tariff to achieve desired traffic reductions, to account for the subsidy afforded to those with discounts.

4.6 Future Year Analysis

Future year modelling from the Queenstown Public Transport Business Case (QPTBC) was used to estimate potential future impacts of the preferred scheme concept.

The traffic volumes from the 2023 base year analysis were increased in line with QPTBC projections to estimate the 2039 future year requirements. The impact of road pricing is assessed against both the QPTBC “do minimum” and “Bus Max” options. For this analysis, the Bus Max option is intended to

proxy the QPTBC preferred option¹⁷, with extensive improvements in public transport infrastructure and service provision.

The preferred scheme concept was assessed against future peak charges of \$0 (no road pricing), \$5, \$10 and \$15. Table 4.4 shows selected results from the future year analysis. At a minimum, the \$5 charge level the preferred road pricing concept is expected to generate significant traffic reductions and corresponding travel time improvements. If minimal public transport improvements are implemented (QPTBC Do Minimum), an increase in the peak charge to \$15 in 2039 is estimated to be required to maintain network performance at levels achieved by the preferred scheme in 2023.

With public transport interventions (QPTBC Bus Max), the required 2039 peak charge to maintain network performance decreases to approximately \$10. This intuitively follows from the idea that better alternatives to driving will reduce baseline traffic volumes, and hence the charge required to achieve desired network performance.

Table 4.4 Future Year Analysis Results – Preferred Concept

Approx. year	Baseline PT network	Indicative peak charge	Annual net revenue	95th percentile car travel time [†]		New annual PT boardings
				SH6A	SH6 South	
2023	Current	No road pricing	-	25 min	18 min	-
		\$5	~\$11m	19 min	16 min	170-250k
2039	QPTBC Do Min	No road pricing	-	>35* min	>35* min	-
		\$5	~\$13m	21 min	22 min	300-450k
		\$15	~\$40m	18 min	20 min	500-800k
2039	QPTBC Bus Max	No road pricing	-	>30* min	>30* min	-
		\$5	~\$13m	21 min	20 min	250-400k
		\$10	~\$40m	19 min	19 min	400-700k

Bolded rows indicate scenarios with approximately equivalent network performance.

[†] Worst direction, worst peak. SH6A: SH6 roundabout to Stanley Street, SH6 S: Jacks Point to SH6 Roundabout

* These are estimated maximum times and dependent on other factors e.g., network saturation levels, bridge capacity limits and land use changes e.g., Jacks Point/ Hanley's Farm intensification

4.7 Complementary Measures

Public Transport

Road pricing can affect travel behaviour in a number of ways. Public transport is one alternative to travel at peak times, but others include people shifting the time of their trips e.g., delaying travel to outside of the peak, working from home, shifting to another mode e.g., walking or cycling, or deferring their trip altogether e.g., instead of making two trips in a day, linking the journey purpose with another trip outside of the peak. In general, however, it will be the availability and suitability of a reliable and

¹⁷ It is noted that the QTPBC preferred option is to operate an enhanced Bus Max service pattern with supporting system improvements. The non-enhanced option was applied due to scope limitations regarding modelling and would also result in a conservative assessment so as not to overstate any potential benefits.

high-quality public transport alternative that will be the most significant contributor to reducing the potential negative impacts and maximise the benefits of road pricing.

The preferred scheme concept is likely to improve public transport through two primary mechanisms. Firstly, reduced congestion on the road network will allow buses to operate more quickly, reliably and – if travel time improvements allow higher service levels – frequently. This is important as some trips previously using private vehicles will divert to public transport, increasing the demand for these services. Secondly, road pricing provides a potential revenue stream to expand and improve PT services in the District. Revenue used for this purpose will attract further trips to public transport and maximise the productivity of a constrained transport network.

The QPTBC estimates a “target” mode share required to maintain acceptable network function in the face of projected travel growth in the Whakatipu basin. Figure 4-7 shows the modelled QPTBC Bus Max and target mode shares against the estimated mode share range if the preferred road pricing concept is implemented (in addition to Bus Max). The preferred option is modelled with a \$5 charge in 2023, increasing to \$10 in 2039. While not a complete solution, the results show that road pricing can make a significant contribution to achieving the target mode share on key links in the Queenstown network¹⁸.

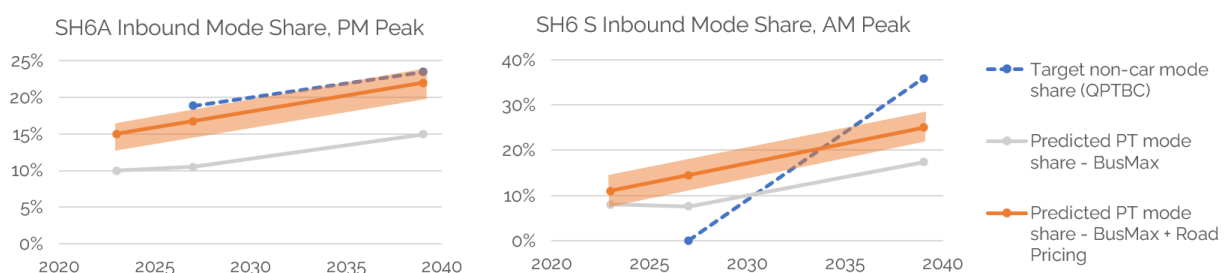


Figure 4-7 Estimated Preferred Option Mode Share on Key Links

Scheme Future Proofing

The rapidly changing transport landscape in Queenstown highlights the need for any road pricing scheme to be robust to future growth and changes in travel patterns. In particular, growth on the southern SH6 corridor is likely to exceed forecasts used in previously transport modelling and increased public transport provision is likely to influence the shape of travel demands in the District.

International examples of road pricing use various methods to update prices. London and Stockholm follow an administrative process where political decision-makers need to agree to change prices. This typically results in infrequent price changes (London: 4 times in 12 years; Stockholm: once in 10 years) and can obscure the link between charge level and network performance. Charge increases are often viewed by the public as a means of revenue generation, potentially undermining public support.

Alternatively, Singapore applies a rules-based approach to adjust prices, up or down, on a quarterly basis to achieve the desired corridor operating speeds. Singapore seeks to achieve 15th percentile speeds of 20-30 km/h for local roads and 45-65 km/h for expressways. While there are some complexity and legibility drawbacks with such a flexible pricing structure, consistently applying this process reinforces the link between the scheme and improved travel levels of service.

Key to any pricing strategy is clear focus on agreed objectives of the road pricing scheme and avoiding changes to these objectives without public support. When establishing the pricing tariff, there is a tension between maximizing network throughput and maximizing revenue. The stakeholder feedback

¹⁸ Note that road pricing also serves to reduce general traffic on the network, and therefore reduces the required number of PT trips to achieve minimum network performance. Therefore, the target mode share under road pricing may be lower than indicated in the QPTBC.

however clearly identified that optimising network performance should be primary objective. This approach would also see the determination of the key performance metrics, such as the V/C ratio (traffic volume / corridor capacity), journey travel times between key network nodes e.g., Shotover Street to Grant Road, and journey time reliability. Through a clear and transparent benchmarking process, the tariffs can be adjusted accordingly to optimise the network performance what will also maintain community support.

While revenue generation is not a core objective of the scheme as modelled, an understanding of how net revenues might be used is essential. In the Queenstown context, three of the five proposed gates in the concept scheme are on the State Highway network (SH6A, SH6 East and SH6 South), which are managed by NZTA but used by both local and visitor traffic. As a result, there would likely be a community desire to see revenue returned to the local area. One possible resolution of these conflicting objectives is for NZTA to set charges to optimize network performance (perhaps based on level of service targets agreed with local partners), while returning net revenues to the region.

Road Pricing Pre-Requisites

The discussion around pre-requisites considered whether or not infrastructure projects needed to be completed prior to the introduction of a pricing scheme, e.g., Queenstown package, or public transport services upgraded. Alternatively, should a particular network operational trigger, such as travel times on SH6A be set. Stakeholder views on these varied, with some participants not seeing any major obstacles to implementing road pricing, however it was noted that some improvements, such as public transport upgrades would be required if the target mode shift was to be achieved.

4.8 Analysis Limitations

The analyses presented in the preceding sections are at a concept level only. In particular, the following limitations should be noted:

- **Fixed pricing structure**
To maximize network efficiency and minimise equity impacts it is likely that variable charges by time of day, gate location and/or season would be appropriate, however fine-grained variable pricing *within* the peak period is not included in this assessment. Only a flat charge per peak period has been modelled, with a differing charge level for morning, interpeak and evening periods.
- **Indicative charge level**
The price used for analysis is indicative only, to assess likely change in travel behaviour. It is not intended to assess the affordability or equity of a particular charge level or structure.
- **Travel time estimates**
Route travel time impacts for a given change in traffic volume are estimated using travel time models calibrated to route data from 2023, which does not explicitly account for wider network and intersection delays. Extrapolation from this 2023 to future traffic conditions is uncertain, so travel time savings, particularly in future years, are likely conservative.
- **Base and future year alignment**
The base year for QPTBC modelling is 2027 vs. 2023 for this study. QPTBC-modelled growth in link trips from 2027-39 has been used to approximately increase 2023 origin/destination volumes. The resulting increases by link are within 5% of QPTBC modelling, but this is an indicative future year only – development on the southern corridor is likely to exceed existing model projections.

It is recommended that detailed transport modelling addressing these limitations is undertaken if the preferred scheme is taken forward for further analysis.

5. Public Engagement

Road pricing schemes can be particularly contentious, and it is essential that a high level of public awareness and support is developed as part of the scheme design process. This analysis has identified the technical benefits regarding the estimated reduction in traffic volumes and improved journey time reliability. However, the focus of any engagement activity must be on communication to the public about *why* a scheme is being considered and *how* it would affect them, and the benefits individuals will receive. For example, increasing travel time variability due to congestion can have the following effects:

- **Commuter trips:** drivers are having to leave earlier to reach their workplaces on time and then arrive home later, which impacts on personal quality of life. This can also be exacerbated if trip linking occurs, e.g., dropping children off at school, or after school activities which are also impacted.
- **Home services:** many people in the community require home help such as home nursing services. Improved travel time reliability means these essential service providers can spend more time with their clients rather than on the road.
- **Courier drivers:** a congested network means they cannot complete as many deliveries in a day, or have to work extended hours to complete their delivery runs. Reducing congestion means they can be more efficient, lowering costs and improving delivery times.
- **Tourists visiting Queenstown** are often time limited and seek to maximise their experiences. Without reliable travel times, they are forced to reduce the number of activities they may undertake, taking money out of the local business and community.
- **Tour Coaches:** coach drivers operate under strict rules regarding the total hours they are allowed to drive without a break. For example, for day trips departing Queenstown for Milford Sound, journey time delays along SH6A can compromise a driver's ability to complete the trip legally and safely.

QLDC officers have confirmed that while traffic is a concern for the community, there is less understanding about the magnitude of the issue from the local perspective. It is important therefore that any communication and engagement strategy focus is on increasing community awareness and understanding of the key issues, before socialising the concept of road pricing (as "one tool in the tool box") with a focus around developing social license to consider such a scheme further.

Key Messages

While any key messages would need to be carefully considered, baseline messaging could potentially include the following, noting that the narrative will evolve during the engagement stages:

- *Council is assessing different mechanisms to improve the performance of the transport network to reduce delays and congestion. Road Pricing, as indicated by the Government, is one tool that should be considered. No decisions have been made.*
- *Council, along with other partners such as NZ Transport Agency Waka Kotahi and Otago Regional Council are making significant improvements to transport infrastructure and services in the District. Council is focused on continual improvements to support effective and efficient movement across the District's transport network.*
- *Council represents the community and is undertaking this work to help inform and influence any discussions that may occur at the national level e.g., policy development and engagement and/or legislative select committee stage.*

Potential Approach

Consideration of key stages in an engagement plan are outlined below. This overall strategy will also be dependent on any internal or external considerations that Council may have. For example, the

Government's Q3 Action Plan¹⁹ includes decisions around time-of-use charging legislation. If QLDC wished to ensure their concerns are captured in this process, bringing forward development and analysis activity may be warranted.

Stage 0 – Council Approval

As a technical PoC, it is recommended that a briefing workshop is held with Councillors and QLDC Executive to socialise ideas and understand any key concerns regarding the findings of this PoC. Any issues or identified concerns can be assessed and addressed prior to proceeding with further public engagement.

Stage 1 – Key Stakeholder Engagement

Due to the potential complexity of the messaging, confirming, and communicating the reasons why, and benefits are essential. This will be of particular importance to key stakeholder, community and business groups who may influence wider community opinion. This engagement should seek to:

- Validate or align communication narratives and approaches
- Assess the acceptance or otherwise of road pricing, its potential benefits, and costs
- Identify community and advocacy groups to leverage for early engagement and during public engagement
- Identify any potential community champions.

Stage 2 – Public Engagement

The general engagement strategy should be focused on the achieving the following objectives:

- Understanding public sentiment and pain points regarding transport in the District
- Understanding how this sentiment may have changed over time e.g., perceptions of deterioration or improvements and impacts
- Developing trust with the community to introduce road pricing as a potential consideration

Stage 3 – Specific Engagement

Assuming public sentiment supports further consideration of a road pricing scheme and/or Council endorsement, more specific engagement activity can be undertaken. As noted above, this will be dependent on any adopted timeline that Council may seek to achieve.

Given the complexity of road pricing, and the potential for misunderstanding, a two-phase approach is recommended that combines a deliberative democracy approach alongside broader public consultation.

Deliberative democracy is an engagement approach that involves community members in the decision-making processes through facilitated discussions and debates. In the context of road pricing schemes, deliberative democracy helps develop community consensus and social license in several ways:

- **Informed decision-making:** stakeholders are provided with unbiased information and data, enabling them to make informed decisions about the scheme.
- **Active participation:** Community members are encouraged to engage in discussions, share their concerns, and suggest solutions, fostering a sense of ownership and investment in the decision-making process.
- **Diverse perspectives:** Through bringing together community members with diverse backgrounds, experiences, and opinions, this ensures a comprehensive understanding of the scheme's impacts and opportunities are understood.

¹⁹ Coalition Government's Q3 Action Plan for New Zealand, <https://www.beehive.govt.nz/sites/default/files/2024-07/Q3%20Plan.pdf>

- **Building trust:** Through transparent and inclusive processes, deliberative democracy helps build trust among all participants.
- **Consensus-building:** Facilitated discussions aim to reach a collective understanding, fostering a sense of community consensus and social license.
- **Addressing concerns:** Concerns and objections are addressed through open dialogue, reducing opposition and increasing support for the scheme.

By engaging citizens in a deliberative democracy process, road pricing schemes can gain the support and acceptance of the community, ultimately leading to successful implementation and positive outcomes for all stakeholders.

The Northern Infrastructure Forum, in partnership with Kōi Tū (University of Auckland), has applied a deliberative democracy process in the development of their road pricing scheme, with positive outcomes²⁰.

Through working with appropriate qualified experts, e.g., IAP2 certified practitioners, to deliver the deliberative democracy process, the key scheme objectives and approaches can be developed further prior to engaging with the public.

²⁰ *Community Panel on Time-of-Use Charging in Auckland*, Kōi Tū: The Centre for Informed Futures
<https://informedfutures.org/congestion-community-panel/>

6. Summary and Recommendations

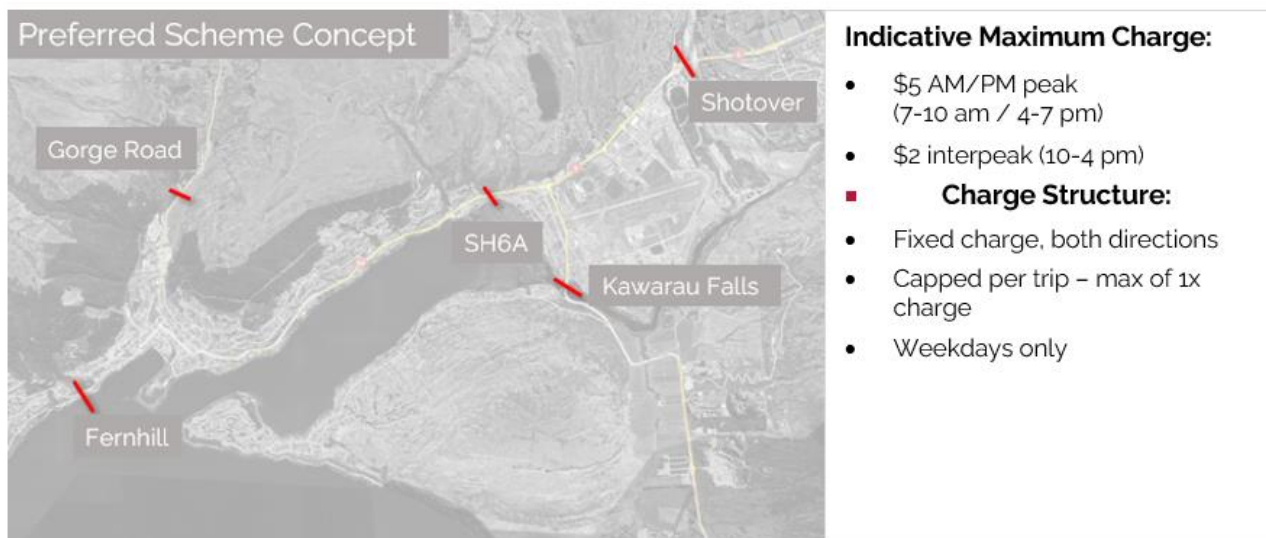
The stakeholder-led process followed by this study has successfully developed principles, objectives, and a potential concept design of a road pricing scheme for Queenstown. While there was strong support for the further development of the preferred concept, concerns were raised about ensuring equity considerations were well understood, and that it should not be seen as an additional tax on the community. The significant, and growing, congestion experienced on the transport network was recognised as matter of increasing importance; without decisive action being taken, the quality of life and economic productivity of the area will be compromised.

Significant investment is being made in the physical infrastructure, as well as in public transport, but further interventions are required to maintain network performance. Road pricing, as part of wider set of travel behaviour activities, is seen as an essential component to achieving the network goals.

The development and analysis of this scheme concept was intended to assess the potential travel impacts of road pricing in Queenstown, but the study does not recommend that the scheme concept be implemented without further investigation, particularly with regard to equity impacts, social acceptability and detailed transportation modelling.

6.1 Preferred Concept

The preferred concept consists of five gates located on key links in the Whakatipu basin. Drivers would be charged, through appropriately technologies, upon travelling through any gate, with at most one charge occurring per trip. Indicative charge levels are \$5 in the morning and evening peak periods, and \$2 in the interpeak period. There would be no charge for off-peak or weekend travel.



6.2 Areas for Further Analysis

As part of the final workshop, stakeholders indicated specific consideration of the following would be desirable:

- **Further understanding of the benefits.** While the estimated 10% - 17% reduction in SH6A traffic volumes is significant from a transport perspective (which would be similar to the general difference between school term and school holiday traffic volumes) there was concern that this would not be perceived by the community as significant enough to justify the introduction of a road pricing scheme.

- **Equity impacts and potential mitigations.** How would any scheme affect low-income households or those who may be car dependent? How could this be mitigated
- **Tourist impacts.** While tourism is recognised as a significant contributor to the economy, stakeholders were keen to ensure that the perceived cost share between residents and visitors was appropriately assessed.
- **Scheme pre-requisites.** Having viable and attractive alternatives, such as public transport services and/or completed infrastructure upgrades, for affected communities was seen as desirable prior to the introduction of a pricing scheme to support community uptake. How these could be programmed to align with the introduction of any scheme was considered as important.
- **Revenue hypothecation.** Any new fees for accessing the road network could be seen as a tax and may compromise community support. Allocating all revenue generation to system maintenance, operation and enhancements was seen as of critical importance.

6.3 Findings and Recommendations

The key findings of this proof-of-concept study are that a road pricing scheme in Queenstown could:

- Generate significant reductions in congestion and travel time
- Significantly increase public transport mode share
- Generate positive net revenue

Figure 6-1 summarises the potential benefits in terms of network performance, wider transport impacts and community outcomes.

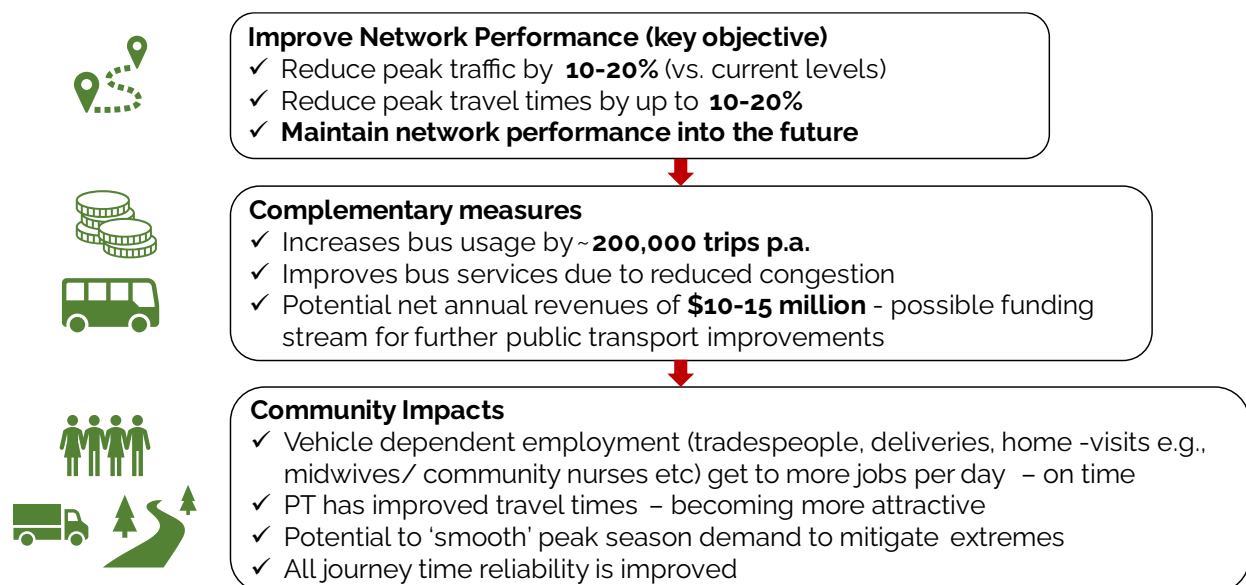


Figure 6-1 Benefit Summary of Concept Road Pricing Scheme

7. References

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Appendix A. Level of Service

A1. Level of Service

Level of service (LOS) is a technical term that refers to defined qualitative performance categories for transport links, intersections or networks, typically measured on an alphabetical scale from A to F. It is widely used in transport planning and engineering to translate potentially complex performance metrics into a more readily understandable qualitative ranking. Level of service rankings existing for many modes of transportation; however, this definition focuses on road network performance.

Table A1.1 shows the level of service definitions for arterial roads. Lower levels of service correspond to increasingly slow and unstable conditions experienced by those using the road.

Table A1.1 Arterial Road Level of Service Definitions (from Austroads *Guide to Traffic Management*²¹)

Level of Service	Traffic Condition	Percentage of Base Free-Flow Speed
LOS A	Free flow, unimpeded manoeuvring	> 80%
LOS B	Reasonably unimpeded operation, ability to manoeuvre is slightly restricted	67-85%
LOS C	Stable operation, ability to manoeuvre is more restricted	50-67%
LOS D	Less stable operation, small increase in flow may cause substantial delay	40-50%
LOS E	Unstable operation	30-40%
LOS F	Unstable operation, high delay and extensive queueing	< 30%

Figure 1-1 shows theoretical relationships between traffic density, speed and flow. Higher traffic densities (lower LOS) result in lower maximum flow rates (vehicles per hour) and a reduction in link capacity. Thus, level of service improvements on severely congested networks can improve both travel times and network capacity.

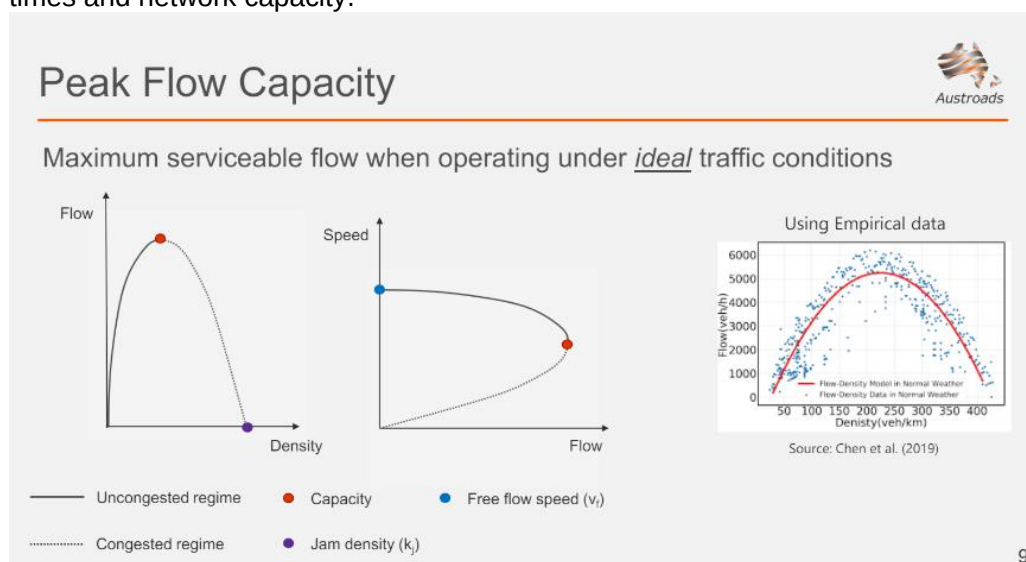


Figure 1-1 Speed/Flow Relationships (from Austroads *Traffic Analysis Concepts*²²)

²¹ *Guide to Traffic Management – Part 3*, Austroads (2020) <https://austroads.com.au/publications/traffic-management/agtm03>

²² *Traffic Analysis Concepts*, Training Module Slides, Austroads (2020)

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