

# Toll Review

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Summary of work completed prior to election  
of the Minns Labor Government

June 2023

## Acknowledgement of Country

We acknowledge that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia, and the oldest continuing culture in human history.

We pay respect to Elders past and present and commit to respecting the lands we walk on, and the communities we walk with.

We celebrate the deep and enduring connection of Aboriginal and Torres Strait Islander peoples to Country and acknowledge their continuing custodianship of the land, seas and sky.

We acknowledge the ongoing stewardship of Aboriginal and Torres Strait Islander peoples, and the important contribution they make to our communities and economies.

We reflect on the continuing impact of government policies and practices, and recognise our responsibility to work together with and for Aboriginal and Torres Strait Islander peoples, families and communities, towards improved economic, social and cultural outcomes.

Artwork:

*Regeneration* by Josie Rose



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# 1

## Introduction

# 1 Introduction

This report provides a high-level summary of prior work done during 2022 by Treasury and Transport for NSW to assess options to reform the NSW toll road network.

This report is not indicative of recommendations that may be presented to the NSW Government following the new Independent Toll Review, which commenced in April 2023, and does not represent approved policy directions of the former or current NSW Government.

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## 1.1 Objectives of the prior work

The previous NSW Government established a Toll Road Pricing and Relief Reform Review in early 2022. The terms of reference for this review were released to the public on 14 March 2022 and are available on the NSW Parliament website.

Treasury was requested to lead a review into areas of concern on existing tolling regimes, with support from Transport for NSW (Transport). This included consideration of:

- a) inconsistencies embedded in the existing toll road arrangements, leading to customer confusion
- b) cost of living impacts, and fairness and equity for the users of NSW toll roads
- c) lack of optimisation of the road network, including congestion impacts.

The prior work identified policy reform options most likely to achieve the best balance of the following project objectives:

- a) consistency of toll road pricing
- b) fair and equitable toll road pricing
- c) improve road network efficiency, addressing issues of traffic congestion
- d) meeting emission reduction targets
- e) sustainability of road funding, having regard to:
  - i. the impact of socioeconomic equity and affordability of toll road customers
  - ii. the fiscal impact to the NSW Government.

A summary of options developed in 2022 are presented in this report. These options have not been presented to Government for endorsement and do not represent approved policy directions of the former or current NSW Government.

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## 1.2 Consultation undertaken

During 2022, consultation undertaken by Treasury and Transport with customer focus groups, toll road operators, industry groups and government bodies established a clear need for toll reform in Sydney.

This engagement process included:

- a) interviews with select customer and industry stakeholders to identify issues with the current pricing regimes and potential solutions
- b) focus groups with customers across Sydney to understand their concerns with current toll pricing structures and test potential interventions

c) review of submissions to previous tolling related inquiries and reviews.

Consultation was broadly spread across four stakeholder groups:

- a) customer focus groups, including private and commercial customers
- b) toll road operators
- c) industry groups, representing customers and toll road operators
- d) government bodies with oversight or input into toll road policy.

Consultation also included transport and tolling experts from Transport, Treasury, and other areas of the NSW Government.

Figure 1: Overview of stakeholder engagement process

Element	Quantum	Relevant parties (non-exhaustive)
1. Submission reviews	12+	
2. Stakeholder consultations	8	
3. Customer focus groups	3	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-bottom: 5px; background-color: #e0f2f1;">South Western / Western Sydney</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-bottom: 5px; background-color: #e0f2f1;">Upper North Shore / North Western Sydney</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; background-color: #e0f2f1;">CBD / Eastern Sydney / Lower North Shore</div>

# 2

## Executive summary



## 2 Considerable work was undertaken

An early outcome of the prior work was the development of the Toll Relief Rebate Scheme, which was announced in June 2022.

From the prior work, the option to replace the existing varied approach to toll road pricing and move to a consistent motorway network pricing regime emerged as meriting further analysis.

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### 2.1 The case for change

Since 1992, governments have used private financing to develop the Sydney motorway projects rather than relying on public financing alone.

Private financing has involved the building, ownership, operations, and tolling of the motorways by the private sector – a 'concessionaire' – under a long-term contract with the State – a 'concession'.

The piecemeal concession-by-concession approach to motorway development has created a tolled motorway network that now faces several challenges in achieving consistency, transparency, equity and fairness for road users, and optimisation of the road network.

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### 2.2 Toll relief

Sydney residents are estimated to access approximately \$450 million in toll relief through the M5SW Cashback, Registration Relief, Toll Relief Rebate and Large Towed Recreation Vehicle Toll Rebate schemes for the year to 30 June 2023.

The Registration Relief scheme provided cost relief for tolls incurred up until 30 June 2022 (with registration relief granted up until 30 June 2023), with the more comprehensive Toll Relief Rebate Scheme introduced for two years from 1 July 2022.

#### 2.2.1 Toll Relief Rebate Scheme

Announced as part of the 2022-23 NSW Budget, a new broad-based Toll Relief Rebate Scheme has replaced the existing Registration Relief Scheme.

The scheme commenced on 1 July 2022. Tolls incurred from this date have been included in the calculation of rebates entitled by customers, with the first rebate occurring in early 2023.

Every quarter, eligible non-business and small business customers will receive a 40 per cent rebate for every dollar spent on tolls once they have reached a minimum spend of \$375. The maximum annual benefit available to each eligible customer is \$750.

The eligibility criteria for the non-business customers (which is the same as the Registration Relief Scheme except for the \$375 minimum threshold) are:

- drive a NSW privately registered vehicle (less than 2794 kg tare/unladen weight)
- be a NSW resident
- have a NSW toll account (E-Toll or Transurban Linkt)
- have their license plate(s) linked to their personal toll account

Small business customers are defined as a 'sole trader business' with the below criteria:

- have an Australian Business Number (ABN) that:
  - is registered in New South Wales

- is for a business that is physically located and operating in New South Wales has been active since the start of the current financial year
- shows you are a sole trader/individual.
- be the registered contact for the ABN with the Australian Business Register
- not be a taxi or ridesharing business.

## 2.2.2 Means-tested relief

The prior work identified that means testing for toll relief, based on income, could potentially be applied to the the existing toll relief schemes providing more equitable relief measures to the people of New South Wales.

## 2.3 Reform options: price

### 2.3.1 Motorway network pricing

The prior work analysed the concept of motorway network pricing, which could involve adopting a common pricing structure across the tolled motorway network comprising:

- a fixed access charge (paid once per continuous journey on the toll road network), plus
- a distance-based charge (c/km) that could vary across motorway zones
- a single (network-wide) escalation rate (of both the access charge and distance-based charges).

### 2.3.2 Extent of tolling

A new motorway network pricing structure could apply to the Existing Tolled Network (ETN – blue roads in Figure 2 on page 14), or to all motorways (the Continuous Motorway Network, or CMN).

A CMN option could involve tolling some previously untolled roads, but could create a more efficient continuous motorway network.

### 2.3.3 Motorway zones

Different configurations of motorway zones were considered in the context of the motorway network pricing structure.

Defining five zones was found to provide sufficient granularity to reflect the variance in:

- construction costs across Sydney
- choice of public transport and road alternatives across Sydney
- prices currently charged to motorists using the tolled motorways.

### 2.3.4 Other pricing options

#### CBD zone

The creation of a CBD zone was considered, charging an access fee on entry – by motorway and/or arterial road – into the CBD. This option was considered to have the potential to deliver a multitude of benefits, including:

- potentially reducing the numbers of cars entering the CBD (for example, during the morning peak by up to 40 per cent)
- potentially increasing average speed on CBD
- supporting mode shift to public transport
- a more pedestrian friendly CBD.

## **Truck multiplier classification**

The prior work considered that greater granularity of heavy vehicle pricing, compared with the current one class (class B), had the potential to create a more equitable pricing structure that better aligns the toll price to costs and benefits.

## **Heavy vehicle night-time discounts**

The option of a night-time discount for heavy vehicles was considered as a way to encourage motorway usage and discourage arterial road usage during off-peak hours.

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## **2.4 Reform options: non-price**

### **2.4.1 Signage and communications**

Opportunities to improve tolling information provided to customers at the roadside through more static and digital signage, and online through map integration and dedicated tolling applications were identified.

### **2.4.2 Fees, charges and notices**

The prior work considered that administrative fees and charges should be aligned with costs incurred. Opportunities exist for toll notices to be consolidated, administration simplified, and communication with customers improved.

### **2.4.3 Technology**

While reviewing the toll road network, the option of moving to tagless tolling in the future was considered. However, a business case could be required to inform any decision from government to invest in new technologies across the network.

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## **2.5 Implementation of potential toll reforms**

The prior work identified that further phases of work were necessary to assess policy options before recommendations could be made to government. Engagement with toll road concessionaires, to seek agreement on reform options and implementation pathways (where necessary), was highlighted as part of the next steps from the prior work.

3

Background

# 3 Toll roads have played an important role in Sydney’s motorway development

Over the last 30 years, the development of toll roads has created a world-class motorway network in Sydney faster than could have been possible without private sector finance, and with reduced exposure for the government to both operational, construction and traffic risk.

## 3.1 The NSW toll road network

Australia’s first toll road opened in Sydney in 1811 between Sydney and Parramatta. Toll roads have since played an important role in Sydney’s development. The Sydney Harbour Bridge, Australia’s first toll bridge, opened in 1932, linking Sydney’s north and south by road and charging sixpence for each vehicle.

The Sydney Harbour Tunnel, M2, M5, M4 and M7 motorways have provided much needed capacity and connectivity through Greater Sydney, creating premium transport routes facilitating the rapid movement of people and freight. Arterial roads and public transport provide complementary and more affordable options for less time-sensitive travellers.

Sydney’s ‘motorway network’ comprises approximately 179 km of motorway roads, including both tolled and untolled roads.

The following toll roads are collectively defined as the ‘toll road network’ and form part of Sydney’s motorway network:

**Table 1:** Summary of NSW toll network

Tolled motorway network	
<ul style="list-style-type: none"> <li>• Cross City Tunnel (CCT)</li> <li>• Eastern Distributor (ED)</li> <li>• Lane Cove Tunnel (LCT)</li> <li>• M2</li> <li>• M4*</li> <li>• M5SW*</li> <li>• M7</li> <li>• M8/M5 East*</li> </ul>	<ul style="list-style-type: none"> <li>• Military Road E- Ramps (MRE)</li> <li>• NorthConnex</li> <li>• Rozelle Interchange</li> <li>• Sydney Harbour Bridge (SHB)</li> <li>• Sydney Harbour Tunnel (SHT)</li> <li>• M4-M8 Link</li> <li>• M6 Stage 1 (estimated completion 2025-26)</li> <li>• Western Harbour Tunnel (WHT) (estimated completion 2028)**</li> </ul>

\* Parts of M4, M5SW and M5 East are untolled.

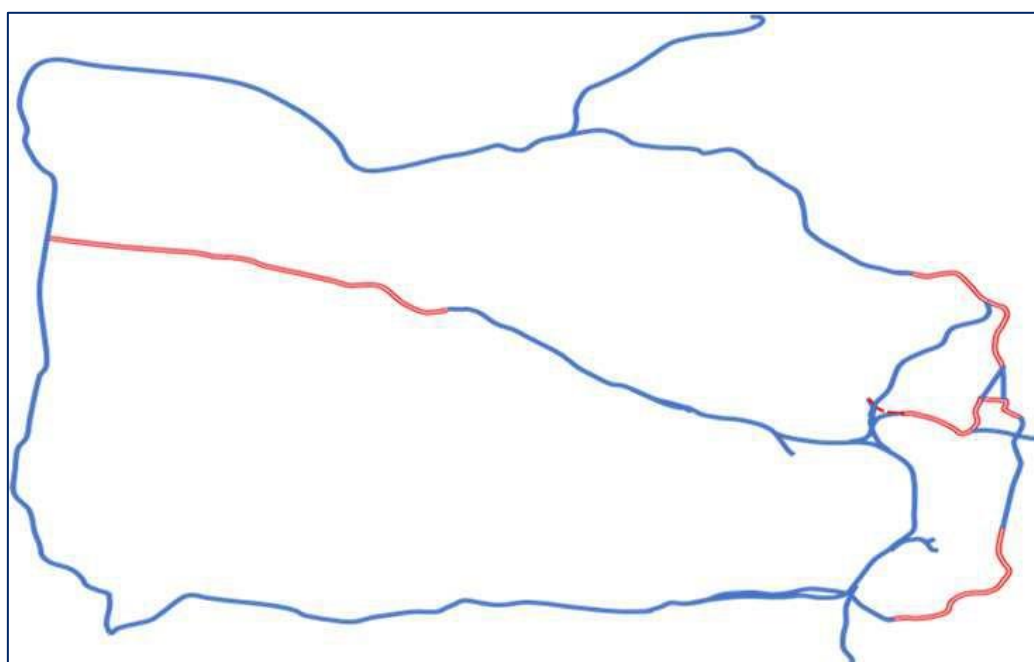
\*\* No government decision has been made on the tolling of WHT. However, the WHT business case summary assumes the WHT will be tolled.

The following untolled motorways form the remainder of Sydney's motorway network (shown in red in Figure 2 below):

**Table 2:** Summary of NSW untolled motorway network

Untolled motorway network	
<ul style="list-style-type: none"><li>• ANZAC Bridge</li><li>• General Holmes Drive</li><li>• Gore Hill Freeway</li><li>• M4 West (M7 to WestConnex M4)</li></ul>	<ul style="list-style-type: none"><li>• Southern Cross Drive</li><li>• Warringah Freeway</li><li>• Western Distributor</li></ul>

**Figure 2:** Sydney motorway network



Blue lines denote currently tolled sections and red lines denote currently untolled sections of the motorway respectively.

## 3.2 NSW toll prices

Table 3 below includes a summary of the tolling regime and current price point by toll road.

**Table 3:** Summary of the tolling regime and current price point per toll road

Tolled route	Tolling regime	Toll pricing (Oct - Q4 2022)
M5SW*	Fixed (bidirectional)	Class A: \$5.20 Class B: \$15.59 (3.0x)
Eastern Distributor*	Fixed (unidirectional, northbound only)	Class A: \$8.84 Class B: \$17.69 (2.0x)
Hills M2	Fixed by points (bidirectional)	Class A: \$2.63-\$8.90 Class B: \$7.90-\$26.69 (3.0x)
Cross City Tunnel	Fixed (bidirectional)	Class A: \$3.01-\$6.38 Class B: \$6.02-\$12.76 (2.0x)
Lane Cove Tunnel	Fixed (bidirectional)	Class A: \$3.70 Class B: \$12.50 (3.4x)
Military Rd E Ramp	Fixed (bidirectional)	Class A: \$1.85 Class B: \$6.25 (3.4x)
NorthConnex	Fixed (bidirectional)	Class A: \$8.90 Class B: \$26.69 (3.0x)
Westlink M7	Distance (bidirectional)	Class A: \$0.45 per km (Max \$9.05) Class B: \$1.36 per km (Max \$27.15) (3.0x)
WestConnex M4	Distance + flagfall (bidirectional)	Class A: \$1.48 flagfall + \$0.55 per km (Max \$8.87) Class B: \$4.44 flagfall + \$1.64 per km (Max \$26.61) (3.0x)
WestConnex M5 East	Distance + flagfall (bidirectional)	Class A: \$1.48 flagfall + \$0.55 per km (Max \$7.52) Class B: \$4.44 flagfall + \$1.64 per km (Max \$22.56) (3.0x)
WestConnex M8	Distance + flagfall (bidirectional)	Class A: \$1.48 flagfall + \$0.55 per km (Max \$7.52) Class B: \$4.44 flagfall + \$1.64 per km (Max \$22.56) (3.0x)
SHB / SHT	Fixed/time-of-day (southbound only)	Time of Day: Peak \$4, Off-peak \$2.50, Shoulder \$3

Definitions as of 17 October 2022:

**Class A Definition:** 2.8 metres or less in height and 12.5 metres or less in length. (For the Eastern Distributor and M5SW, Class A vehicles must also be either a three-axle vehicle under 2.0m in height, or a two-axle vehicle under 2.8m in height)

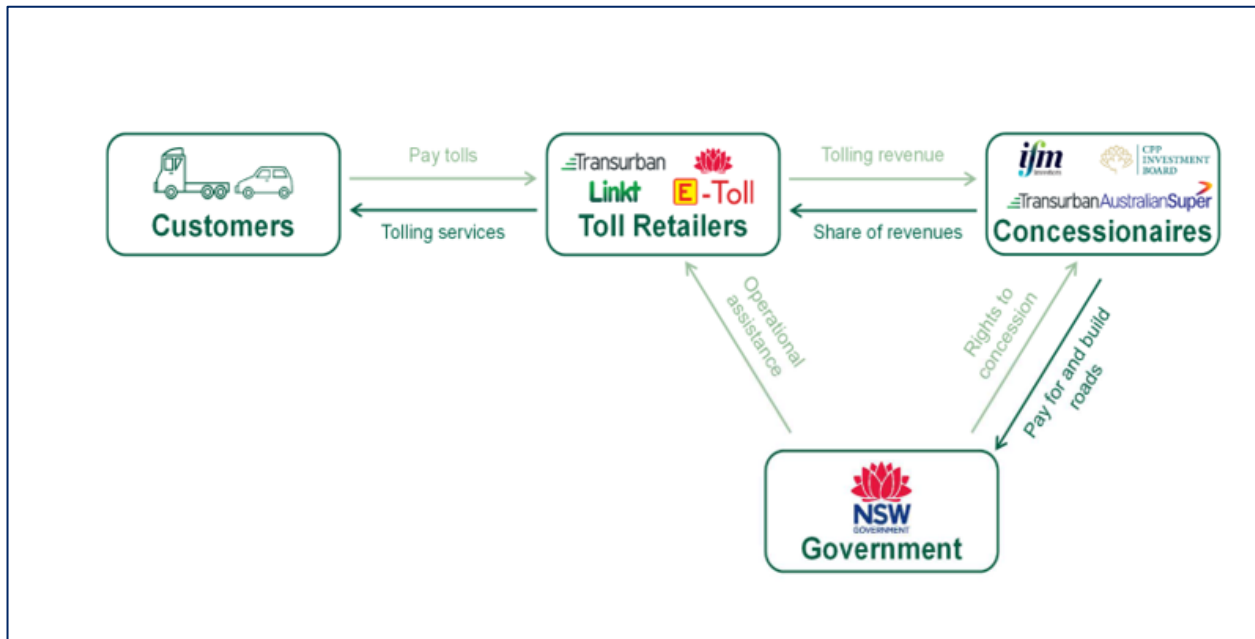
**Class B Definition:** All vehicles that exceed the Class A dimensions

\* For the Eastern Distributor and M5SW, Class A vehicles must also be either a 3-axle vehicle under 2.0m in height, or a 2-axle vehicle under 2.8m in height.

### 3.3 The tolling ecosystem

There are four distinct parties in the NSW tolling ecosystem: the NSW Government, the toll road concessionaires, the toll retailers, and the toll road customers. Figure 3 below explains the interface between these parties in the NSW tolling ecosystem.

Figure 3: NSW Tolling Ecosystem





# 4

## The case for change

## 4 Issues with the current tolling regime

Consultation and engagement with customers, operators, and other stakeholders, revealed three major issues with the current tolling regime:

- A lack of optimisation of the toll road network in terms of traffic movement leading to congestion during peak periods that impacts motorists and reduces the economic value of the network
- Inconsistencies in pricing leading to a poor customer experience, difficulty understanding toll charges, non-uniform price increases, and high tolls for cross-city trips
- Cost of living, fairness, and equity issues for toll road users, with tolling disproportionately affecting regions with a high concentration of toll roads and limited public transport options, such as Western Sydney

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### 4.1 Lack of optimisation of the road network leading to congestion

The fragmented development of Sydney's toll road network and case-by-case approach to setting tolls means that the tolled network currently operates sub-optimally. Consequently, traffic is not evenly distributed because of the differences in price across the network. Motorists will weigh up the benefit of a faster journey time or other free route options.

Congestion on the tolled networks reduces their economic value and inhibits their capacity to improve the overall network. A network approach to pricing may better balance traffic between the tolled network and arterial and non-tolled motorways. This pricing option has the potential to result in higher speeds across the network in aggregate, thereby optimising the road network to reduce congestion.

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### 4.2 Inconsistency in pricing

The prior work identified significant inconsistencies in the current tolled network.

A mix of pricing mechanisms, including fixed prices, distance-based prices, access plus distance prices and time-of-day pricing, lead to very different prices per kilometre travelled.

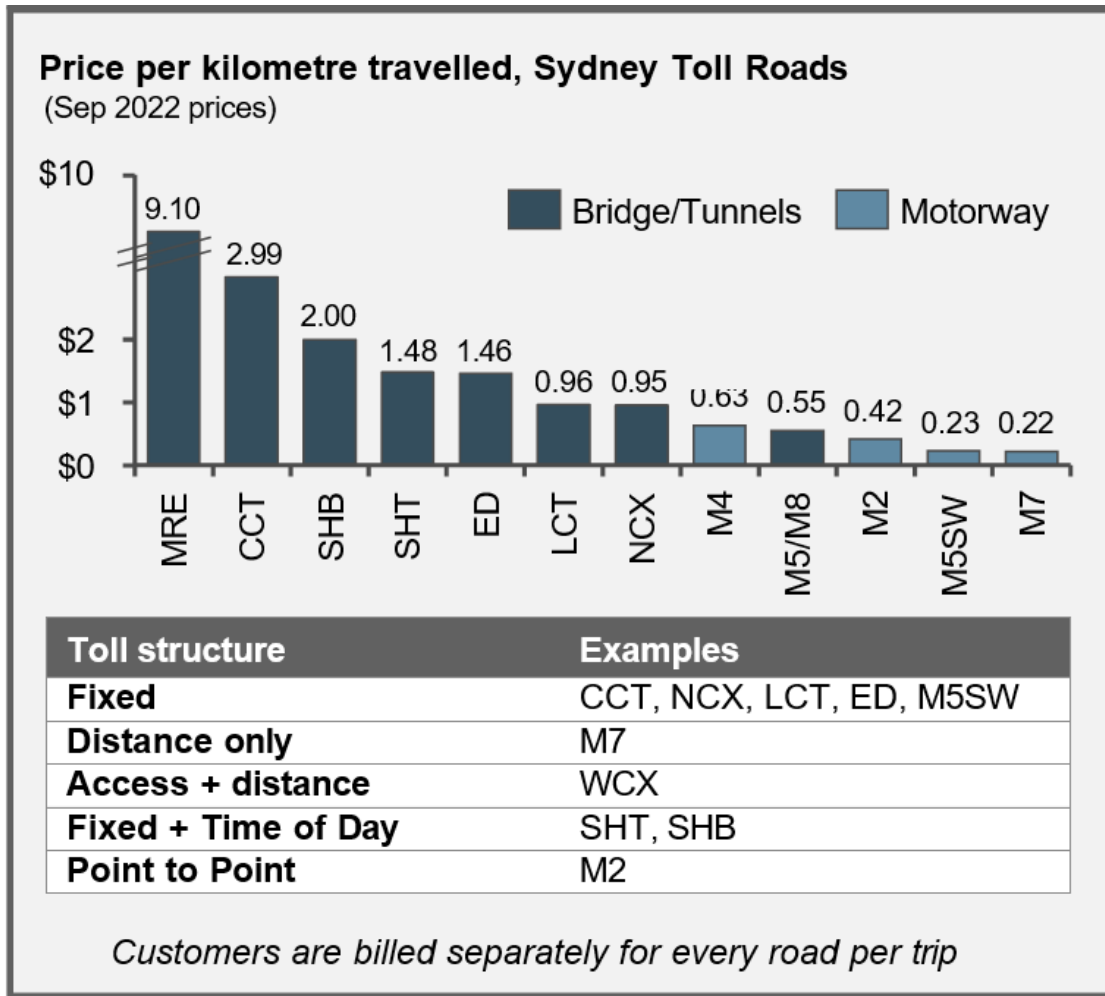
In addition:

- There are inconsistencies in terms of directions tolled – all motorways are bidirectional, except for the Eastern Distributor, the Sydney Harbour Bridge and Sydney Harbour Tunnel.
- There is variability in heavy vehicle pricing, with different multipliers on some toll roads
- There is inconsistent and insufficient on-road signage, making it difficult for customers to evaluate whether to access a toll road 'in the moment'.

For toll roads to be most economically efficient, customers need to be able to access them for their highest value trips, i.e. business or freight trips. The current pricing inconsistencies may make it difficult for customers to evaluate whether to use the toll road, leading to non-optimised toll road usage and road network inefficiencies.

Figure 4 below shows the price per km travelled, by maximum distance travelled, by toll road.

Figure 4: Price per km travelled, by maximum distance travelled by toll road (Sep 2022)



**Note:** The Military Road E-Ramps (MRE) is an outlier, created as the price per kilometre is calculated based on the length of the ramp i.e. approximately 200 metre ramp at \$1.82 charge.

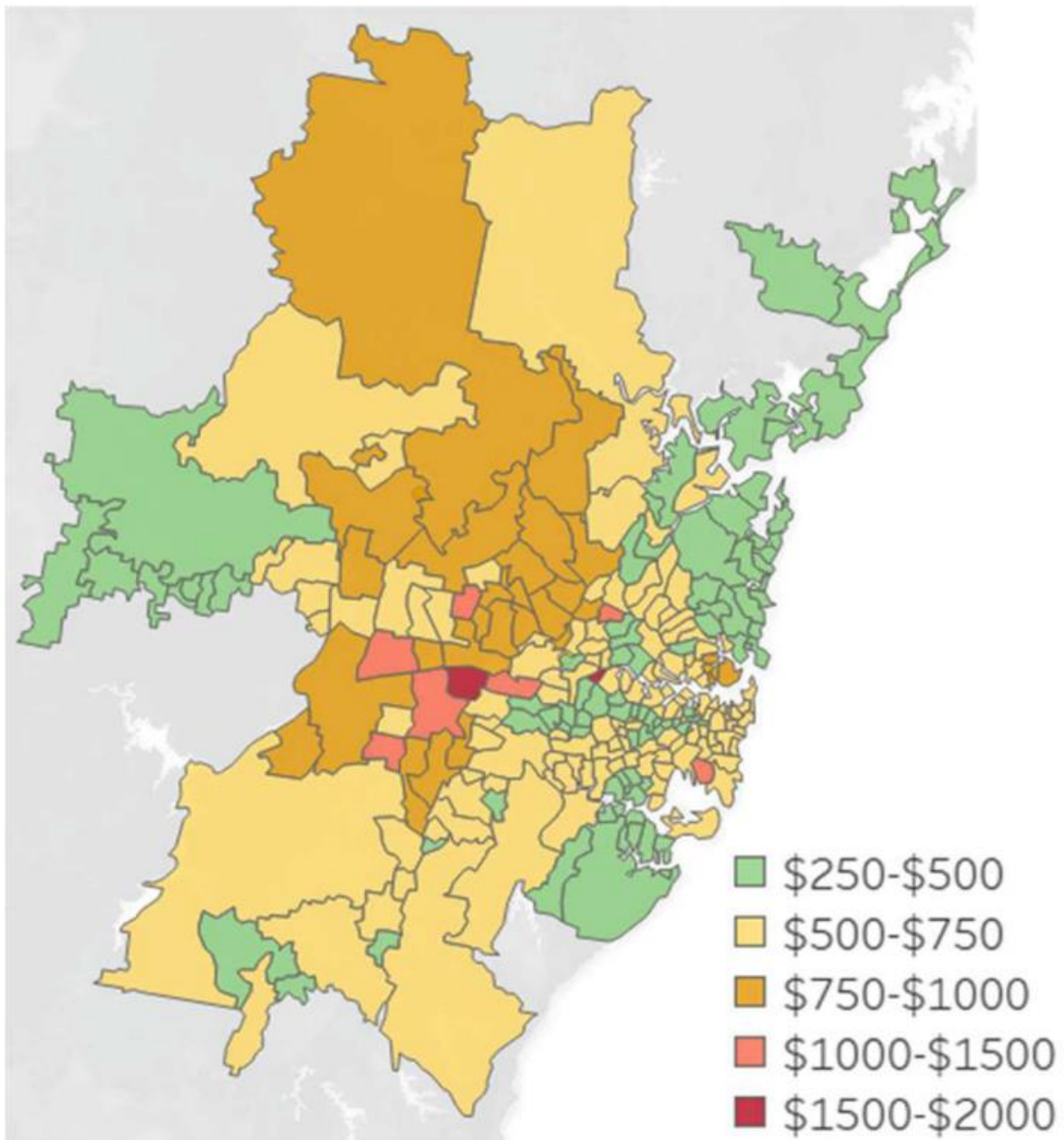
### 4.3 Cost of living, fairness and equity

Sydney’s tolled network provides a premium transport solution for the rapid movement of people and freight. For most customers, the network provides an additional transport option for their most important journeys.

However, the prior work highlighted that for some customers, particularly those in Western Sydney, the tolled network may be the only viable transport option for accessing services and employment. Fair, equitable pricing is therefore essential to ensuring that customers are not unfairly impacted by their level of transport choice when accessing the network.

Figure 5 below shows the average annual spend on tolls by Sydney postcode for the 2020-21 financial year, with the highest annual spend found in Western Sydney.

**Figure 5:** Average toll spend per non-business customer account by postcode in the 2020-21 financial year



Work done to date has found that toll price options should therefore take into consideration the different needs and circumstances of customers across Sydney, while balancing toll revenues and road network efficiency.

# 5

## Tolling design considerations

# 5 Development of price and non-price options

The prior work indicated that introducing a network pricing structure may represent an opportunity to optimise the economic efficiency of the toll road network, and improve tolling equity, consistency and affordability.

Through the potential pricing alternatives and other pricing options, government could generate substantial economic and non-economic benefits for New South Wales.

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## 5.1 Pricing principles

Design of a potential pricing structure was guided by the key project objectives of consistency of pricing, fair and equitable pricing, and improved network efficiency.

Other considerations and constraints also influenced the development of toll pricing options:

- the level of change that can be imposed on the community to ensure the acceptability of the change
  - affordability of tolling across Greater Sydney
  - customers' choice of public transportation and road alternatives
  - the historic and future costs to build motorways across Sydney, including surface roads, tunnels and bridges
  - any requirement to compensate concessionaires for lower toll road revenues, if at all
  - the capability of existing tolling technology and changes that may be required to enact the toll pricing options.
- 

## 5.2 Pricing structure

Three steps formed the basis for developing options for a new pricing structure:

1. the underlying base structure
2. additional pricing options
3. pricing levels.

### 5.2.1 Base structure

A variety of pricing structures are currently used across Sydney's toll roads. As such, there is a long list of potential options for a network pricing structure:

- fixed pricing
- time-based pricing (e.g. daily or annual passes)
- dynamic pricing
- zonal pricing
- distance-based pricing
- access plus distance pricing
- combinations of the above

Previous analysis of the above options found that an access plus distance pricing structure across the motorway network could best align with the project objectives.

This pricing structure could establish a consistent price floor for all journeys, thereby disincentivising short trips that create congestion on motorways and are disruptive to motorway network efficiency.

Customer engagement confirmed that an appropriate access charge could be considered both intuitive and broadly fair.

The distance charge could provide greater pricing consistency and equity, with the toll users driving the furthest being charged the most.

## 5.2.2 Supplementary options to network pricing

Of the pricing options available to supplement the base structure, three additional options were considered:

- bidirectional and half-priced tolling on all toll roads, including the Eastern Distributor and Harbour Crossings (SHCs), to improve network consistency and traffic efficiency
- new heavy vehicle multipliers, to align heavy vehicle prices more equitably to their impact on the roads (i.e. vehicles without trailers pay less)
- time-of-day tolling through night-time discounts for heavy vehicles, improving road network efficiency by removing heavy vehicles from arterial roads.

## 5.2.3 Pricing components

Establishing the right pricing level is critical to meeting the project objectives.

Traffic modelling tested the following pricing components:

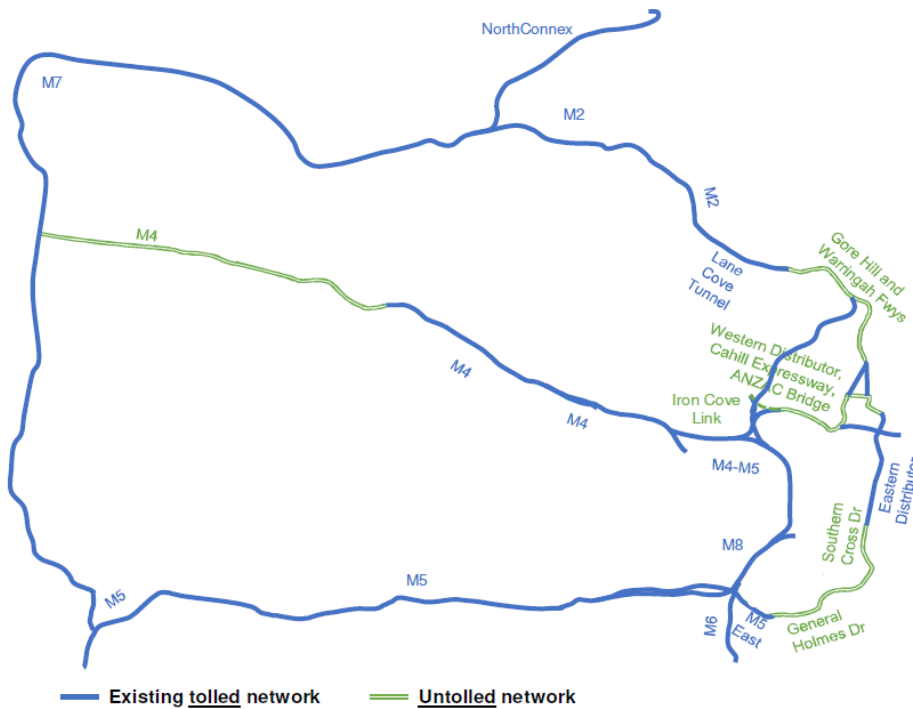
- access charge
- distance charges by zone
- toll escalation.

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## 5.3 Extent of tolling

An option of extending tolling from the existing tolled network (ETN) to the entire Sydney motorway network (the continuous motorway network, or CMN), was considered. The CMN concept includes approximately 36 km of currently untolled motorways (see Figure 6 below).

Figure 6: Sydney Motorway Network (2031 view)



Existing (untolled) motorways	Distance
M4 (M7 to WestConnex)	15 km
Gore Hill Freeway	4 km
Warringah Freeway	4 km
Cahill Expressway	2 km
Western Distributor and ANZAC Bridge	4 km
Southern Cross Drive	5 km
General Holmes Drive	2 km
<b>Total</b>	<b>36 km</b>
Future committed motorways	
Iron Cove Link	8 km
M12 (excluded from map)	16 km
<b>Total</b>	<b>29 km</b>

Applying network pricing to a CMN could maximise the efficiency of the road network. This could also align with the future potential for longer term road user pricing - across the entire road network.

Consideration of road user pricing is relevant due to an expected future uptake of electric vehicles and the decline in fuel excise tax which has historically funded road infrastructure for governments across Australia.

However, the prior work considered this approach to be challenging in the short term, due to the difficulty involved in tolling previously untolled motorways.

## 5.4 Toll pricing scenarios

Three motorway network pricing scenarios were developed for analysis as part of the prior work.

### 5.4.1 Do-minimum scenario

A 'do-minimum' scenario retaining the existing tolling regimes - pricing structures, escalation and heavy vehicle treatment - was used as a comparator for the analysis of the alternate scenarios.

This scenario addressed some obvious tolling inconsistencies - more specifically by introducing half-priced, bidirectional tolling on current unidirectional toll routes (the Eastern Distributor and SHCs).

### 5.4.2 Existing Tolled Network (ETN) scenario

This option applied the new (do minimum) base pricing structure to the existing tolled network (ETN) to maximise equity and affordability outcomes.

This includes a network-wide access plus distance (zonal) pricing structure, with five distance zones, bidirectional tolling on all roads, and a more granular heavy vehicle classification system.



### 5.4.3 Continuous Tolled Network (CMN) scenario

This scenario considered maximising road network efficiency by applying the same pricing options as the ETN scenario to the entire motorway network (the CMN).

Two variants were considered:

- **CTN Option A – Efficiency:** this variant adopted a single network price level that could provide the greatest network efficiency.
  - **CTN Option B – Zonal Pricing:** this variant adopted zonal pricing and focused on both efficiency and affordability outcomes.
- 

## 5.5 Pricing levels

Under each network pricing scenario, specific pricing levels were modelled to optimise against the three project objectives, with a focus on the following impacts:

- price impact to the customer (i.e. addressing affordability and choice of public transportation)
- traffic network impact
- the financial impact to government.

Different motorway zones were developed to test these impacts and optimise options for potential different pricing levels.

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## 5.6 Motorway zones

Different configuration of motorway zones were considered in the context of the access plus distance charges.

Different pricing across motorway zones was considered to offer several benefits, including:

- providing greater flexibility to enable more equitable outcomes through pricing differentials
- better allowing prices to broadly reflect the cost of delivering infrastructure
- forming a basis for further user pays pricing models.

The introduction of this mechanism was also considered to provide the smoothest transition from the current pricing regime to a future access plus distance pricing regime.

### 5.6.1 Number of motorway zones

Consideration was given to the trade-off between having multiple zones to maximise the equity and efficiency of the network, versus maintaining consistency of pricing across the network.

The design process also considered the need for flexibility in pricing of any future toll roads, particularly where these roads offer direct alternatives to existing toll routes, i.e. the Western Harbour Tunnel.

The option considered to strike a good balance between these competing objectives could be to create five motorway zones, with three pricing levels.

The proposed zones are detailed in Figure 7 and Table 4 below:

Figure 7: Sydney motorway map – proposed zones

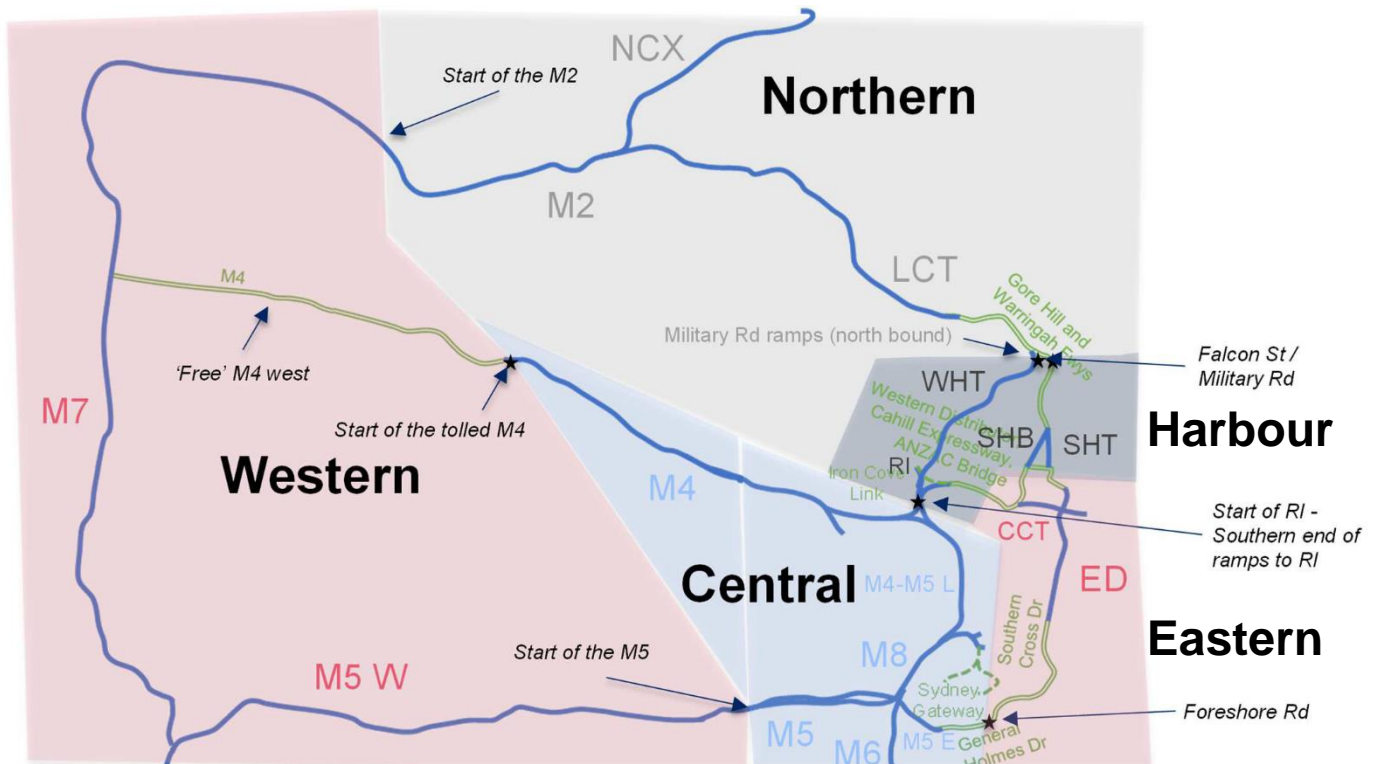


Table 4: Proposed zones, roads and pricing levels

#	Zone	Roads	Pricing level
1	Western	M7, M5SW	Lowest
2	Central	WCX, M6	Medium
3	Northern	NCX, M2, LCT, Military Road	Medium
4	Harbour	SHT, SHB, WHT	Medium
5	Eastern	ED, CCT	Highest
Access charge		All roads	

A five-zone structure was considered as offering an optimal balance between consistency of pricing, addressing equity concerns, and providing flexibility for future pricing decisions.

Fewer zones (i.e. only two zones) could increase consistency, but this option was found to create a larger number of ‘worse off’ users across the network. Fewer zones could also limit the government’s capacity to align prices with the pricing principles.

Defining five zones was found to provide sufficient granularity to reflect the variance in:

- construction costs across Sydney
- choice of public transport and road alternatives across Sydney
- prices currently charged to motorist using the tolled motorways.

Additional consideration was given to the unique status of the Sydney Harbour Crossings (SHCs), creating a Harbour zone.

## 5.6.2 Harbour zone

Consideration was given to the pricing of the SHCs in the context of options for a new network-wide pricing structure (i.e. access plus distance charge).

Due to historical anomalies, the SHC tolls apply one-way on southbound trips only, causing traffic imbalances between northbound and southbound trips.

No price rises since 2009 have also led to heavy congestion in peak hours in both directions.

Finally, equal or uniform prices for motorists crossing each of the SHCs (including Western Harbour Tunnel in the future) is considered important to avoid congestion that could be created if one Harbour crossing was cheaper than the other.

An option was considered which created a (notional) fixed distance for all SHCs at 2 km per crossing, which could:

- equate the distance charge, irrespective of the actual travel distance across the Harbour
- maintain consistency with the potential broader pricing structure by introducing each way tolling on the SHC and removing the current time of day and peak pricing option
- remove the risk of traffic imbalances between crossings.

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## 5.7 Escalation

The current escalation regimes across the toll road network create consistency and equity issues for motorists. At a minimum, consistent network pricing could require the alignment of escalation regimes to ensure consistent pricing over time.

The prior work considered this could likely be achieved in the form of a rate set at or around the weighted average of current escalation rates.

However existing toll prices and their escalation rates are contracted, requiring discussion with toll road concessionaires about the positive and negatives impacts against current arrangements.

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## 5.8 Other pricing options

### 5.8.1 CBD zone

The prior work considered that a separate CBD zone option could also be considered, which could involve levying a charge on all vehicles entering the CBD (but not those by-passing e.g. via the CCT).

The option of a CBD zone has been raised by several other studies.<sup>1 and 2</sup> A CBD zone could deliver a multitude of benefits, including:

- potentially reducing the numbers of cars entering the CBD during the morning peak by up to 40 per cent
- potentially increasing average speed on CBD roads by up to 10%, with potential network-wide speed increases of 1 per cent during morning peaks
- supporting mode shift to public transport, partly because of increasing bus speeds into the city, due to less traffic on in-bound roads

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<sup>1</sup> *Why it's Time for Congestion Charging, Better Ways to Manage Busy Urban Roads*, Grattan Institute 2019

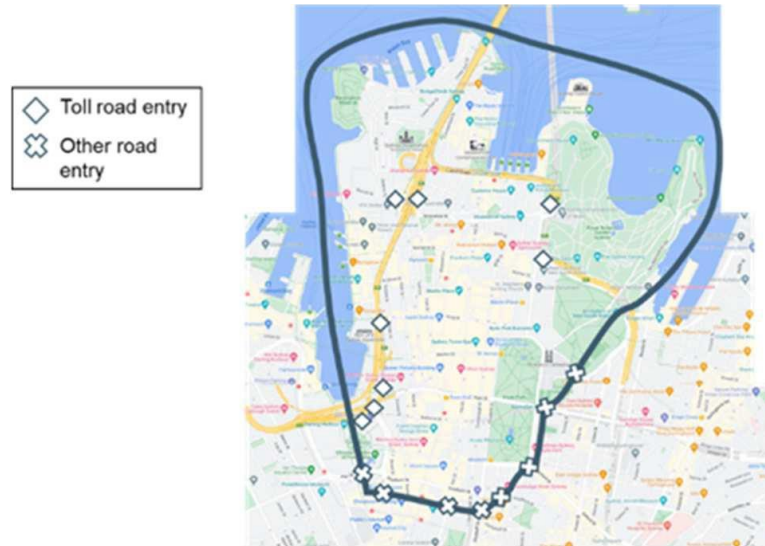
<sup>2</sup> The NSW Productivity Commission has also recommended a CBD cordon charging system

- a more pedestrian friendly CBD.

A CBD zone could be an equitable and effective way to ease congestion. Similar zones have successfully been deployed in cities like London, Stockholm, and Milan.

However, in Sydney, a CBD zone could only be effective if introduced across all entry points into the CBD, resulting in a charge being levied on previously free roads which access the CBD. The boundaries of a potential Sydney CBD are shown in Figure 8 below.

**Figure 8:** Potential CBD zone



Given the importance of re-activating the CBD post-COVID-19, and the significant level of change associated with introducing a CBD cordon (including the need to toll every free arterial road), the previous review deprioritised this option in the short-term but highlighted this as an option to be considered in the future.

### 5.8.2 Heavy vehicle multipliers

Currently, all heavy vehicles are grouped into one class (Class B), with multipliers set at 3x the passenger vehicle toll, with some small variations by toll road.

The prior work considered whether greater granularity of heavy vehicle pricing could create a more equitable pricing structure that better aligns the toll price to costs and benefits.

An option considered was to segment heavy vehicles based on both length and axle configuration:

- vehicle axle configuration could be pre-classified and confirmed on the road using licence plate recognition technology
- length could be measured through (largely pre-existing) on-road cameras

The prior work considered axles to be generally correlated with vehicle weight, the key determinant of road wear and tear. Using other dimensions in conjunction with axles could create greater granularity and account for changes in vehicle configuration (e.g. an articulated vehicle sometimes travelling without a trailer).

This option could allow the creation of up to four heavy vehicle groups, with multipliers considered in the range of 2.5x for the smallest group to 5x for the largest (refer to Table 5 below).

**Table 5:** Heavy vehicle groups, by axles and dimensions

Axles	Max length	Typical Description	Group	Multiplier
2	12.5 m	Two-axle truck or bus	2	2.5x
3	12.5 m	Three-axle truck or bus	3	3x
>3	12.5 m	Four-axle truck		
3	19 m	Three-axle articulated vehicle, or rigid vehicle plus trailer	4	4x
4	19 m	Four-axle articulated vehicle, or rigid vehicle plus trailer		
5	19 m	Five-axle articulated vehicle, or rigid vehicle plus trailer		
≥6	19 m	Six-axle articulated vehicle, or rigid vehicle plus trailer		
>6	19 m	B-double or heavy truck plus trailer		
>6	19+ m	A/B-double or heavy truck plus trailer	5	5x

However, this approach was considered to be more complex to implement than alternative options and expected to require some capital investment.

Stakeholder consultation with operators and the freight sector was identified as an important element of further phases of work.

Further technical investigation could also need to assess ease of implementation. If this model proves too challenging to implement, a purely axle-based pre-classification system could also be considered.

### 5.8.3 Heavy vehicle night-time discounts

The option of a night-time discount for heavy vehicles could encourage motorway usage and discourage arterial road usage during off-peak hours.

Across the road network, there are known instances of heavy vehicles diverting onto adjacent arterial roads to avoid tolls (colloquially known as 'rat running').

A potential option considered was the introduction of targeted off-peak pricing (i.e. at night) that could encourage higher utilisation of toll routes during these periods.

The estimated cost of this initiative required further analysis at the time of the prior work.

# 6

Summary analysis:  
impact of price options

# 6 Assessing the impact of price options

The prior work considered that by adopting certain pricing levels for a motorway network pricing structure, applied across motorway zones, a range of significant benefits could be realised by motorists. However, this could require additional government subsidy.

Further detailed analysis was required to assess possible sources of additional funding.

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## 6.1 Expected benefits – customer and traffic impact

The goal of introducing network pricing was to meet the three project objectives of the prior work, while minimising pricing impacts (worse off trips and worse off users) and balancing other constraints, such as potential financial impacts to government.

In addition to generating a net positive economic impact for NSW, at the pricing levels modelled, either the ETN or CMN scenarios (i.e., motorway network pricing) were found to have significant impacts on customers, concessionaires, and government.

The potential benefits of motorway network pricing where significant government subsidies were provided could include:

- improved road network performance with faster traffic speeds and greater utilisation of the toll road network
- more consistent, equitable and fairer prices that reflect ‘user pays’ principles as well as:
  - the relative cost of road construction (surface versus bridge/tunnel)
  - affordability – potentially lower toll prices for most users (depending on price levels)
  - people’s choice of alternative transport modes.
- other key benefits could include:
  - improved customer experience
  - greater consistency via the correction of anomalies across the network.

### 6.1.1 Improved road network performance

At the pricing levels modelled, both the ETN and CMN scenarios were considered as offering:

- reduced journey times (in aggregate) across the entire network (reductions mostly on arterials) due to faster average speeds across the network (with even faster speeds on the motorway network with a CMN)
- fewer vehicles on suburban roads, creating safer roads and communities, particularly in Western Sydney.

### 6.1.2 More consistent, equitable and fairer prices

Initial analysis identified a range of impacts from moving to network pricing, at the pricing levels modelled.

It is noted that the impact of the ETN vs. Do Minimum Option varied depending on the pricing levels modelled and had implications for the cost to government of implementation.

Customers under the modelled scenarios could be ‘better off’ or ‘worse off’ compared with the current state. ‘Better off’ or ‘worse off’ can be interpreted in different ways. For the purposes of the analysis, they referred to an account (or trip) that could cost a user less or more with network pricing than in the current state.

Similar modelling of the CMN options demonstrated greater economic benefits relative to the ETN however a lower customer benefit due to the introduction of tolls on previously untolled roads.

### **6.1.3 Other benefits**

Both network pricing options were found to have the potential to enable:

- improved customer experience
- greater consistency via the correction of inconsistencies across the network.

#### **Improved customer experience**

Potential benefits of the options considered include:

- reduced vehicle operating costs (in aggregate)
- improved, more consistent signage to support on-road decision making and improve transparency of communication (i.e. standardised electronic signage).

#### **Greater consistency via the correction of inconsistencies across the network**

Potential benefits of the options considered include:

- greater consistency of toll prices and pricing structures, significantly improving the customer experience by making tolling simpler to understand (with greater consistency on the CMN)
- greater consistency of pricing for heavy vehicles across motorways and better alignment of toll prices to the operating costs of different heavy vehicle types.

### **6.1.4 Benefits to road industry and the people of NSW**

The ETN and CMN options were also considered as offering potential benefits for the road industry compared to the Do Minimum option.

Motorway operators could benefit from higher utilisation of their roads, more satisfied customers, and operational efficiencies.

The people of New South Wales could benefit through:

- a fairer, flatter, more efficient toll pricing structure
- better customer experiences
- reduced heavy vehicle usage of arterial roads, creating placemaking opportunities
- a more efficient road network
- if a CMN were implemented, government could also potentially benefit from a new revenue stream through the tolling of previously untolled roads, depending on how much of that benefit was re-distributed to existing toll road customers.

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## **6.2 Expected costs**

### **6.2.1 Financial impact to government**

Depending on the pricing levels adopted, a network pricing structure could result in a different amount of collected toll revenue compared to the Do Minimum scenario, for which the State may need to compensate the concessionaires on an annual basis until the end of each concession.

Detailed analysis is required to research possible funding sources to minimise any potential burden on taxpayers of possible reform measures.



## **6.2.2 Required capital expenditure to implement tolling regime**

To implement a new toll pricing structure, the State could need to negotiate with concessionaires around meeting the costs of front-end and back-end technology upgrades, and additional considerations such as information and signage.

## **6.2.3 Required operational expenditure to maintain tolling regime**

A new toll pricing structure is expected to require a larger recurring cost base, given technology requirements incremental to the Do Minimum scenario.

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## **6.3 Need to expand the modelling of network pricing scenarios**

Significant additional work is required to model the impacts of different scenarios concerning network pricing. Different zoning patterns, degrees of cross-subsidisation, concessionaire and government impacts all need to be considered in considering sustainable outcomes.



7

Technology

# 7 Opportunities to review technology

Technology plays a vital role in tolling, enabling vehicle passage detection, toll calculations and enforcement.

A shift to network pricing could likely require significant technology and infrastructure investments, including new front-end tolling points and a new back-end tolling engine.

## 7.1 Technology options

The prior work identified an opportunity for the government to review technology use across the motorway network. This could require a more detailed investment evaluation.

### 7.1.1 Front-end technology

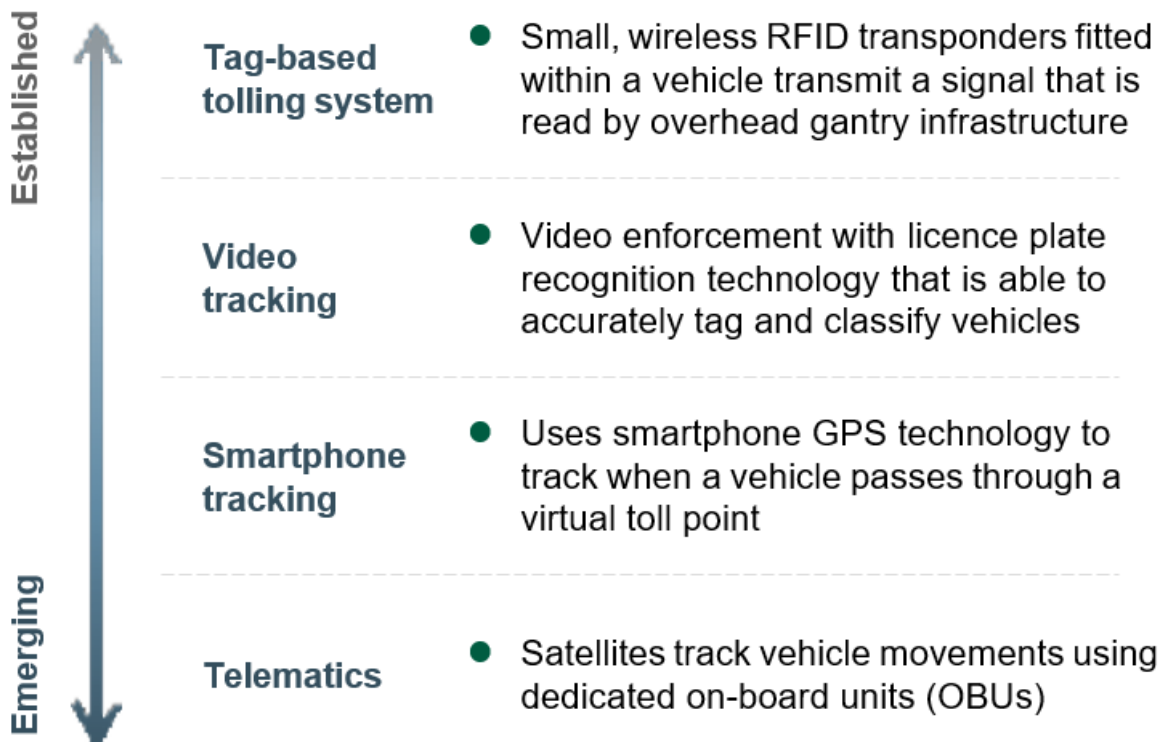
Front-end motorway technology and infrastructure includes:

- technology used for passage detection, including for heavy vehicle classification and enforcement purposes
- roadside or over-head supporting infrastructure used to house the main tolling technology including gantries and poles.

The current front-end tolling infrastructure is a tag-based system with video camera detection for bespoke tagless tolling and enforcement purposes.

Front-end options range from tags (status quo) to video, smartphone tracking and on-board telematics.

Figure 9: Tolling technologies and definitions



There is an opportunity to progress to a tagless system, which could be video based in the short to medium term. Unlike longer-term technologies, like smartphone GPS and On-Board Unit telematics, video-based tolling appears to be more readily implementable.

Tagless tolling could offer significant benefits over tag-based systems including:

- lower cost of supporting infrastructure compared to gantries for tag reading
- improved customer convenience and experience through removing the need for tags
- improved implementation of key toll design options (e.g., means-tested relief and more granular heavy vehicle classes)
- modernising tolling infrastructure so that it can be relied upon for future tolling needs.

For these reasons, the prior work identified an opportunity for the government to formally evaluate the option of introducing a tagless video-based tolling system. This system could need to be subject to a detailed business case.

## 7.1.2 Back-end technology

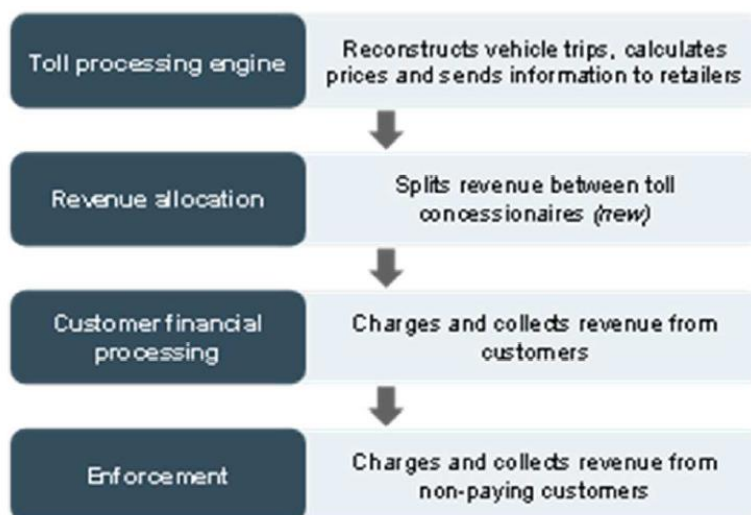
Currently, Linkt and E-toll operate independent back-end systems.

A network tolling option could require the creation of a single back-end system, where all vehicle movements could be processed together regardless of the toll road operator.

The back-end system could have four major processes:

- toll processing engine
- revenue allocation
- customer financial processing (no change)
- enforcement.

Figure 10: Back-end processes and definitions



If network pricing were to be implemented, these processes could need to scale considerably to accommodate 1-2 million trips per day across 2-3,000 potential trip configurations.

A network-wide back-end system could be built and managed by the government or a third party.

Potential benefits in managing the back-end could include:

- reduced reliance on third parties for back-end operations and pass-through costs
- enablement of future public transport platform integration such as integrating with the Opal ticketing network

- better visibility over traffic data for operations, planning and future tender processes for new toll roads.

Further evaluation of the potential costs, including procurement options, could need to be undertaken as part of the same detailed business case for the front-end system.



# Information and signage

# 8 Transparency for customers

Customer concerns have been raised regarding the quality of existing signage on the network, including unclear signage on some toll roads and limited information on toll pricing, structures, and benefits.

The current inconsistencies in pricing between roads makes clear communication more difficult.

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## 8.1 Communication channels

Prior consultation identified that customers value both on and off-road communication channels for information that can help them to understand the value of tolls, i.e. estimated travel times and savings, toll prices, total trip costs, and trip and cost history.

The previous work identified several digital and physical channel options to better provide customers with what they need.

Physical channels could include:

- more static road signs (e.g. toll road start/end; last exit before toll road starts; toll zones)
- digital signage offering real time information (e.g. estimated travel times, travel time savings, prices) for the most common trips.

Online channels could also offer an improved customer experience, for example:

- integration with third-party apps, (e.g. Google Maps, Apple Maps, Waze) to display estimated toll costs for different journeys
- a dedicated website and app detailing the new pricing structure
- Service NSW emails with important information and updates to toll account holders.

# 9

Administrative fees,  
charges and notices



## 9 Process simplification

The previous work identified an opportunity to change the legacy arrangements of administrative fees and charges being levied on motorists, and consolidate notices, to make them simpler and more effective.

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### 9.1 Fees and charges

Administration fees are charged by toll road operators when motorists have no payment arrangement in place, for example, drivers without an automated tag or pass, or when the tag or pass isn't detected.

Charges can also include fines for non-payment by a due date and fees for video matching.

Many of these fees and charges are legacy charges that have been in place for many years and were highlighted as areas of concern for customers in the recent NSW Legislative Council's Inquiry into Road Tolling Regimes report, released in August 2022. Key issues identified by stakeholders include:

- concern that toll notice fees do not reflect the actual marginal cost of administering toll notices
- charges often poorly communicated to motorists
- the slow speed with which toll notices are issued making collection more difficult.

The Government could consider changing the legacy arrangements of admin fees and charges being levied on motorists to make them simpler and more effective.

At a high level, the prior work recommended that reforms to administrative fees and charges should meet the following key objectives:

- ensure fees and charges are reflective of actual processing and administration costs, with an overall aim of reducing charges
- disincentivise non-compliance of unpaid tolls and incentivise adoption of tolling accounts.

Further work was to be done in the next phase of the review to prepare specific options and recommendations.

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### 9.2 Toll notices

Currently motorists receive a toll notice from each toll road operator. A motorist can receive a notice, regardless of whether it is part of a single trip, incurring potentially multiple notices per trip.

This creates the following issues:

- the issuance of multiple toll notices for individual trips leading to cumulative admin fees and charges
- the high number of notices issued (approximately 30 million first and second notices were issued in the 2020-21 financial year).<sup>3</sup>

Toll notices consolidation should meet the following key objectives:

- minimise excessive bureaucracy and administrative effort, including duplication

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<sup>3</sup> Road Tolling Regime Report, NSW Parliament Portfolio Committee No 6, Chapter 5

- simplify the payment process and improve efficiency and timeliness of communication of charges to customers.

Further work is required in the next phase of the review to prepare specific options and recommendations.

## Appendix A: Glossary of Terms

Term	Description
<b>Administration Fee &amp; Charges</b>	Administration fees and charges are levied by toll operators, in addition to the core tolls charged, for various reasons relating to the operation and enforcement of tolls.  Administration fees can be segmented into enforcement and tolling fees.
<b>Articulated Vehicle</b>	Any heavy vehicle which has a permanent or semi-permanent pivot joint in its construction.
<b>Back-end</b>	Back-end technology, refers to the underlying processing, enforcement and allocation technology required to maintain and charge tolls across Sydney's tolled network (i.e. trip reconstruction engine).
<b>CMN</b> (Continuous Motorway Network)	The Continuous Motorway Network refers to a network pricing structure which levies tolls on all motorways, both currently tolled and untolled across Sydney, including future motorways.
<b>Concessionaire</b>	The holder of a toll road concession, which grants said holder the right to operate, maintain, and in particular circumstances build and finance, a motorway for a set term or period of time, before returning the motorway back to the government entity in the required condition. In return for said services, the concessionaire may collect tolls on a contractually agreed basis.
<b>Do Minimum</b>	A scenario which retains the current tolling regimes pricing structures, escalation rates and heavy vehicle treatment, used as a comparator for the analysis of alternative options (i.e. ETN and CMN). The option introduces half-priced bidirectional tolling on current unidirectional toll routes (i.e. ED and SHCs), in order to fix anomalies with the current network.
<b>Enforcement Fees</b>	Enforcement fees are fees related to the levying and imposition of unpaid tolls.
<b>ETN</b> (Existing Tolled Network)	The Existing Tolled Network refers to a network pricing structure which levies tolls on motorways across Sydney that are either currently tolled or expected to be tolled upon completion.
<b>Focus Group</b>	Group interviews, conducted locally across different Sydney geographies, throughout July and August of 2022 to gauge public perception of particular tolling options.

Term	Description
<b>Front-End</b>	Front-end technology refers to the roadside detection technology required to facilitate toll user enforcement and charging (e.g. tags, gantries).
<b>HV Multiplier</b> (Heavy Vehicle Multiplier)	Heavy Vehicle multipliers are a pricing multiplier imposed on those vehicles that exceed Class A vehicle definitions (i.e. greater than 2.8m in height and greater than 12.5m length) when travelling currently on toll roads, typically 3x under current tolling schemes.
<b>LV</b> (Light Vehicle)	A light vehicle is any vehicle that is defined within Transport's Class A vehicle classification (i.e. 2.8 metres or less in height and 12.5 metres or less in length).
<b>Means-tested</b>	Means-tested relief is financial support, with eligibility given to individuals or households under specific income/asset levels.
<b>Motorway network</b>	A motorway is a distinct type of road that has a pure mobility function with no access function; motorways provide for major regional and inter-regional traffic movement.  A motorway network is a stretch of connected motorways.  Sydney's motorway network consists of approximately 179 km of road comprising both tolled (80 per cent) and untolled roads, connecting various localities across Sydney.
<b>OBU</b> (On-Board Unit)	An On-Board Unit is a transceiver, typically mounted within a vehicle, which collects driving and traffic information, often communicating with roadside technology such as toll gantries, for the purpose of toll collection.
<b>Peak/Off-Peak Pricing</b>	A form of variable toll pricing, which raises or lowers prices during period of high and low demand respectively.
<b>Revenue Allocation</b>	A mechanism by which collected toll revenue could be distributed proportionally to all concessionaires.
<b>Rigid Vehicle</b>	Any heavy vehicle which has a single rigid chassis, typically with two axle sets and which is not constructed or adapted to form part of an articulated vehicle.
<b>SHCs</b> (Sydney Harbour Crossings)	A term used to collectively refer to the Sydney Harbour Tunnel (SHT), the Sydney Harbour Bridge (SHB) and Western Harbour Tunnel (WHT).
<b>Tag</b>	A form of toll collection which relies on an electronic tag mounted within vehicles, currently used throughout New South Wales.
<b>Telematics</b>	The integrated use of communication and information technology to transmit, store and receive information from communication devices to remote objects over a network. In the tolling context, it is the technology that underpins OBUs and toll gantry technology.

Term	Description
<b>Transport</b> (Transport for NSW)	Transport for NSW is the leading transport and roads agency throughout New South Wales.
<b>Toll Relief Rebate Scheme</b>	A relief scheme by which toll users are refunded a portion of their tolls paid within a financial year (i.e. for 2023 it is set at a 40 per cent rebate of up to \$750 if users spend more than \$375 per financial year).
<b>Toll Road Network</b>	The network of tolled roads across Greater Sydney, either current or future.
<b>Toll Road Operator</b>	The entities responsible for operational maintenance of toll roads.
<b>Tolling Fees</b>	Tolling fees, is a term used to describe the various associated fees levied by toll road operators relating to the administration of providing toll services (i.e. video matching fees, service fees and dishonour fees).
<b>Video Tolling</b>	A form of electronic toll collection which utilises video of a vehicle's licence plate to identify liability to pay tolls. It requires no electronic tag or OBU. Video tolling in New South Wales is synonymous with tagless or automatic license plate recognition (ANPR) tolling.
<b>Zonal Pricing</b>	Pricing which geographically varies the tolling charge of a toll road by zone (i.e. Northern, Eastern).

Sydney NSW 2000

GPO Box 5469  
Sydney NSW 2001

W: [treasury.nsw.gov.au](https://treasury.nsw.gov.au)

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