Tolling

Introduction

Tolling, or toll collection, is the collection of a fee on certain roads, bridges or tunnels in order to recover all or part of the capital, operating and maintenance costs for that infrastructure.

The revenue from tolling can support significant levels of debt and can be used to construct infrastructure projects earlier than would otherwise be possible using traditional funding sources alone. It can also be ring-fenced to cover the running costs and maintenance of the toll system itself or to repay debt. In some countries, any excess is used to develop and offer alternative modes.

Paying a toll is seen as a user charge that buys a specific right to use a road, bridge or tunnel. For example, you can pay to use the bridge and have a shorter or safer trip compared to other alternative routes. Tolls are therefore generally understood and accepted by road users worldwide.

Road tolling is usually used to contribute to the financing of transport infrastructure. However, a mechanism such as variable tolling can also be used as a tool to optimise demand management and trip suppression.

Objective

Tolling aims to raise revenue and to change behaviour by adding a cost to a journey. This cost will cause drivers to consider alternatives such as different routes, public transport, car pooling or not taking the journey.

Benefits

Revenue	Revenue generation is a significant benefit of tolling and can contribute to the financing of transport infrastructure.
Congestion reduction	Tolling alters modal demand and may suppress some trips. It can therefore reduce congestion, and, in the case of variable tolling, spread the peak, thereby contributing to more efficient network management.
Fairness	Tolls link the benefits for the road user with the cost of providing the road by charging users only in direct relationship to how much of the road they use.
Public transport	Tolling may increase public transport use.

Strategic interventions for tolling

There are many different types of tolls, including:

- flat tolls, eg. $2 for cars and $4 for trucks to allow access to a new road
- variable tolls, which rise and fall depending on traffic levels or time of day
- high-occupancy toll (HOT) lanes and fare lanes where fees are electronically collected via a transmitter from cars. In HOT lanes, low-occupancy vehicles are charged a toll, whereas high-occupancy vehicles (HOVs) or low-emission vehicles are allowed to use the lanes free or at a discounted toll rate (see the Priority Lanes topic)
- cordon tolls, charged when entering and driving in a zoned city centre, and designed to limit access and congestion (see the Road Pricing topic).

Private toll roads

Private-sector involvement in the construction and operation of roads is growing around the world. This is because:

- public funding is often insufficient to keep up with needs for building and maintaining roads;
- the principle of user-pays is now widely accepted, and user charges are perceived as an important means of financing infrastructure;
- the private sector is seen as better at identifying attractive investment projects, and able to build infrastructure more quickly and cheaply at lower risk; and
- commercial pressures can encourage private operators to achieve lower maintenance, toll collection and other whole-of-life operating costs than the public sector.

The private sector funds the construction of a road, tunnel or bridge and then is permitted to charge tolls for a fixed period of time to recoup the cost at a profit. Alternatives to this arrangement include the use of shadow tolls. These are payments made by government to the private sector operator of a road, based, at least in part, on the number of vehicles using the road.

Strategic interventions for tolling contd

Variable tolling

By recognising that trips have different values at different times and places and for different individuals, variable tolls can be placed on existing and new toll roads, bridges and tunnels (only new roads can be tolled in New Zealand). The tolls rise and fall depending on predicted traffic levels. This is to encourage discretionary travellers to travel during less congested periods, to shift to another mode of transportation or to change routes. With fewer people travelling during congested periods, the remaining peak-period travellers move more quickly. Because congestion increases as roads near capacity, even a small reduction in the number of cars on the road can substantially reduce congestion-related delays and crashes.

High Occupancy Toll (HOT) Lane with variable tolling. As congestion in the HOT lane increases, the toll goes up. As congestion decreases, the toll goes down.

New Zealand legislative context

The Land Transport Management Amendment Act (the Amendment Act) 2013 amended the Land Transport Management Act (LTMA) 2003. Prior to the amendments, the Land Transport Management Act contained a number of confusing assessment and consultation requirements that had to be met before the Minister of Transport could approve a tolling scheme.

The changes to tolling simplify the process of approving tolling and replace the previous requirements with a high-level test requiring tolling proposals to be efficient and effective and for the revenue to be used to bring forward infrastructure provision.

Toll operators no longer have to provide one method of payment that does not collect personal information, as this requirement has proven impractical. Providing on-road payment (such as toll booths), required for anonymous payment, is not consistent with the service levels provided by free-flow tolling schemes like the Northern Gateway. Privacy is safeguarded by use of the Privacy Act 1993, the requirement for there to be an untolled alternative route, and a requirement that personal information will only be held for as long as it is needed to fulfil a legal

duty.

The changes to the Act's public private partnership provisions simplify the process of approving public private partnerships and reduce potential barriers to the use of such partnerships.

Case study – Northern Gateway Toll Road, New Zealand

Northern Gateway Toll Road, New Zealand

The Northern Gateway Toll Road north of Auckland opened in January 2009. The Northern Gateway Toll Road is New Zealand's first approved toll road under the Land Transport Management Act 2003 (LTMA). The LTMA enables the completion of transport projects to be brought forward by using tolls to fund part of their cost through debt finance. The new motorway is 7.5km long and runs between Orewa and Puhoi. The road has cost about $365 million. An up-front grant of around $180 million was provided by Land Transport New Zealand (now the NZTA). The revenue from tolling will be used to repay the remaining $185 million.

The scheme provides motorists who choose to use the road with a safer and more direct route between Auckland and Northland.

The toll road uses an electronic toll collection system. Tolls are calculated electronically using vehicle licence plate numbers and other vehicle details such as dimensions, which are captured when vehicles drive under the tolling point.

The toll charges

Vehicle type	**Toll**
Car	$2.20
Motorcycle	$2.20
Light commercial vehicle	$2.20
Heavy vehicle (exceeding 3.5 tonnes)	$4.40

The new road also eases traffic congestion through Orewa, including reducing heavy traffic flows on Grand Drive (the current link road to Orewa), and enhances opportunities for economic growth in the Rodney district, Northland and the wider Auckland region. It has also improved safety on the wider network through reduced traffic volumes.

Motorists are able to choose whether they wish to use the toll road, as the law sets out a requirement for a free alternative route. The free alternative route is the previous State Highway 1 (now State Highway 17) via Orewa and the Hibiscus Coast Highway and this is clearly signed.

Varying the toll would be the most direct means of ensuring that the benefits of the new road are maintained. However, varying the toll tariff could result in an unsustainable diversion onto the alternative route.

Case study – Variable tolling, Sydney Harbour Crossings, Australia

Variable tolling, Sydney Harbour crossings, Australia

Sydney is the largest city in Australia, with a population of 4.6 million people (greater Sydney). The CBD is quite small, occupying an area of less than 6.2km^2, while greater Sydney comprises over 600 suburbs and localities and occupies an area of 2500km^2.

There are now more than 160km of connected motorways located in and around Sydney. Most of the motorways on Sydney's orbital network are toll roads. Motorway tolls are set by each motorway operator. The Roads and Traffic Authority (RTA) sets the toll for the Sydney Harbour Bridge and Tunnel.

The Sydney Harbour Bridge provides a gateway between the City of Sydney and North Sydney and is a main route for pedestrians, cyclists, rail and bus commuters, and motorists. In 2005, the annual average daily traffic volume using the bridge was 161,000. The Sydney Harbour Bridge toll facilities were made completely cashless in early 2009.

The 2.3km harbour tunnel was opened to traffic in August 1992 to provide a second vehicular crossing of Sydney Harbour to alleviate congestion on the Sydney Harbour Bridge. In 2005, the annual average daily traffic volume using the tunnel was 86,800 vehicles. The Sydney Harbour Tunnel has been cashless since June 2007.

The Harbour Bridge and Tunnel combination carries a large proportion of north–south traffic and runs about 280,000 vehicles per day on weekdays. Time of day tolling (variable tolling) started on the Sydney Harbour Crossings on 27 January 2009.

The New South Wales government is aiming to prompt some people to change their travel times or take public transport for trips during peak hours.

Weekdays	
6.30am–9.30am	$4
9.30am–4pm	$3
4pm–7pm	$4
7pm–6.30am	$2.50
Weekends and public holidays	
8am–8pm	$3
8pm–8am	$2.50

Time of day tolling is expected to raise around $12 million a year, which will be reinvested into buying and running 300 new buses.

So far, motorists have adapted well to the changes and traffic volumes have fallen at peak times. There is a marked increase in people travelling before the peak period, with numbers falling again during the peak period between 6.30am and 9.30am on all crossings, when compared to the same time last year.

Case study – The effects of toll removal, Tauranga Harbour Bridge, New Zealand

Tauranga Harbour Bridge, New Zealand

The Tauranga Harbour Bridge, Bay of Plenty, New Zealand, was opened in 1988 and included a $1 toll each way for light vehicles and $4 for heavy vehicles between 6am and 11pm. Over the next 13 years, the daily traffic flow on the bridge increased from 10,000 vehicles per day (vpd) to 27,500 vpd because of the continued strong residential development, mostly in the Mount Maunganui and Papamoa areas, across the harbour from the city centre.

The toll was removed in July 2001 and this enabled an analysis of the effects of the removal of the toll with pre- and post-removal data made available.

In the week immediately following removal of the toll, the daily flows on the Harbour Bridge increased by 18 percent while the daily flows on the Maungatapu Bridge reduced by only 9 percent, meaning a net increase of 7 percent in the combined cross-harbour flows.

The daily flows on the Harbour Bridge increased by 26 percent from 27,600 to 34,900 vpd following toll removal.

After the initial reduction, the flows on the Maungatapu Bridge returned to their pre-toll removal level of 20,100 vpd within the 14-week period.

Tauranga Harbour Bridge

Case study – Hong Kong, road tolls and ownership restraint measures

Road tolls and ownership restraint measures

Hong Kong is located in Southern China in East Asia. The territory's land area consists primarily of Hong Kong Island, Lantau Island, Kowloon Peninsula and the New Territories, as well as some 260 other islands. It had a population of around 7.17 million people (end 2012), but only 1108km^2 of land, making it one of the most densely populated areas in the world.

Hong Kong traffic exhibits high levels of congestion during peak periods, with long vehicle queues at bottlenecks such as the harbour tunnels. Average traffic speeds in the urban areas have been maintained at about 20km/h over the past 20 years, increasing air pollution but improving safety outcomes.

Ownership restraint measures, together with relatively high operating costs due to fuel taxes and parking fees, have limited the growth of vehicles to provide Hong Kong with one of the lowest rates of cars per capita in the world. In Hong Kong, there are around 63 private cars per 1000 population, compared to 300 in London and over 700 in New Zealand.

Currently, tunnel tolls serve as a primary means of influencing traffic distribution and mitigating traffic congestion. There are 13 road tunnels, including three immersed-tube cross-harbour tunnels. Charges vary from HK$8 for a motorcycle to cross the Cross Harbour Tunnel to $250 for a heavy goods vehicle to cross the Discovery Bay Tunnel Link.

Over 11 million trips are made daily on public transport, including rail (on the mass transit railway or MTR), bus, ferry, cable car and long distance escalator. Public transport accounts for nearly 90 percent of all trips.

Complementary measures

Road pricing	Another measure to attribute actual costs of roads to the user.
Public transport	Provides an alternative to private cars and paying tolls.
Cycling	Cycling enables efficient transportation as an alternative to paying tolls.
Priority lanes	HOT lanes are a form of priority that is paid for.
Travel planning	Effective travel planning in combination with toll roads can encourage more efficient use of the transport system.
Traffic information systems	Information on congestion, toll prices and travel times for the user allows better decisions of whether to use a toll road, or an alternative like public transport.

Other policies addressed

Congestion	Tolls raise funds to cover the cost of constructing and operating a road, but also reduce congestion by discouraging some drivers from using the road.
Economic efficiency	Toll roads can be used to improve economic efficiency through smooth flowing traffic and ensuring consistency of travel times.
Infrastructure funding	Tolls provide a method to cover the cost of new infrastructure. Tolls are seen as a change on the user and are generally accepted when new infrastructure is constructed ahead of schedule and a viable alternative remains.

Further information

Northern Gateway Toll Road
http://tollroad.govt.nz/

Sydney tolls
www.rta.nsw.gov.au/
http://sydneymotorways.com/
www.mynrma.com.au/cps/rde/xchg/mynrma/hs.xsl/toll_roads.htm

Hong Kong tolls
www.td.gov.hk/mini_site/atd/2008/s4_eng_1.htm
www.td.gov.hk/transport_in_hong_kong/tunnels_and_bridges/index.htm