

MOBILITY NEWSLETTER

Research and reporting from California, the U.S.,
and around the world.

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Roadway Pricing & User Charges: An Evolving TDM Strategy

The what, where, & how of priced roads

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There are many types of roadway pricing that support diverse policy goals.

Roadway pricing/tolling: a broad term that refers to systems where drivers are charged based on their use of the road network. These systems use technology such as traditional toll gates, cameras with automatic number plate recognition, motion sensors, and in-vehicle devices like transponders to detect traveling vehicles and charge the right toll to drivers.

Types of road pricing



Full & Partial Toll Facilities

- Tunnels and bridges
- Tolled Highways
- Express Lanes



Zone-based Pricing

- Area pricing
- Cordon pricing



Odometer-Based pricing

- Per-mile charges
- Road user charges (RUCs)

NOTE: Drivers also pay for roads in other ways, like gas taxes (MFTs), or registration fees. The difference is that “road pricing” payments are triggered by direct usage of the road network, not just by car ownership or purchase of secondary inputs (like gas).

Policy Goals

- Manage traffic & manage transportation demand (TDM)
- Encourage the use of cleaner vehicles and more efficient travel in groups using discounts and exemptions
- Shift travel to alternative modes like transit

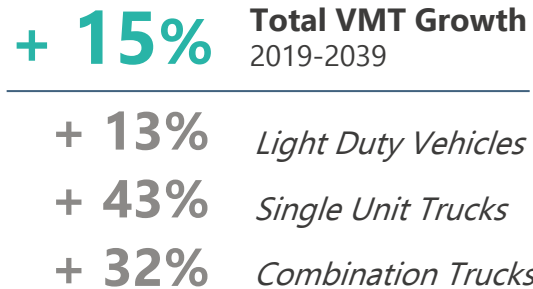
Financial Goals

- Fund infrastructure projects and operations, including other modes like public transit
- Replace declining revenues and cover the increasing costs of roadway maintenance

The priced roadway market is growing quickly in the U.S., and global tolling is projected to nearly double in the next decade.

Demand:

Domestic **car travel is projected to keep growing** over the next 20 years ([S](#)):



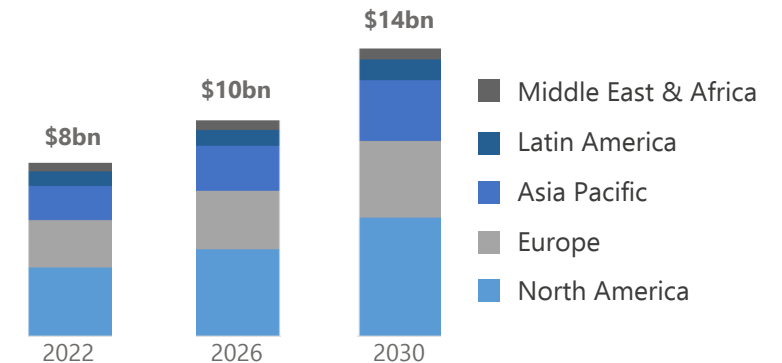
Supply:

The **miles of tolled roads greatly increased** across the U.S. between 2009-2020 ([S](#)):



Revenue:

Global **toll revenues are projected to keep rising** rapidly, at 6.6% per year through 2030 ([S](#)):



Growing revenues from tolls are important to ensure the U.S. can continue to pay for roadway upkeep.

Gas taxes currently pay for over 40% of roadway infrastructure expenses, but revenues are declining as we move toward electric vehicles ([S](#)). Between 2008 and 2021, Congress was forced to allocate over \$270 billion to make up for shortfalls to ensure continued investment in our nation's roads ([S](#)).

Toll roads are already common in the U.S., and price managed lanes (HOT, Express Lanes) are gaining traction.

Traditional Tolls

- Often located on highways or at the entrance to major tunnels and bridges.
- Payment using **transponders** or via **camera-assisted tolling**.
- Don't account for how far a driver travels, and only apply to a specific stretch of road.



At the **Golden Gate Bridge** in San Francisco, drivers pay a fixed-rate, one-way toll to cross the bridge. The tolls are managed by [Golden Gate Bridge Highway & Transportation District](#).

Price Managed Lanes

- **Dedicated highway lanes** that require drivers to pay a toll to enter and offer faster travel, free from congestion.
- Payment using **transponders** or via **camera-assisted tolling**.
- Often allow **exemptions or discounts** to drivers with registered "high occupancy vehicles" or with low-emission vehicles and often allow transit vehicles like buses to use the lanes freely.
- California was the **first state to introduce express lanes** in San Diego in 1991. There are now 400+ miles of express lanes in California.



The **Colorado Express Lanes** around Denver allow drivers to quickly bypass traffic on major highways, often for less than \$1. The lanes are managed by the [Colorado Department of Transportation](#).

Newer kinds of pricing, like congestion pricing and road user charges, are also starting to be implemented in the U.S.

Congestion Pricing

- Price-managed regions where **all vehicles entering a geographic area** are charged a fee that can change based on traffic, time of day, and/or vehicle type.
- Generally used in **large cities**; London, Stockholm, and Singapore are major international examples.
- Require tolling capability at all roadway entrances to the region, often using **vast networks of cameras** for enforcement.
- Payment through a **web portal** or via **automatic billing**.



The Metropolitan Transportation Authority (MTA) plans to open the **Manhattan Central Business District (CBD)** tolling scheme in 2024 following multiple delays. This congestion pricing scheme will be the **first in the U.S.**, [\(S\)](#) and is anticipated to fund over **\$15 billion** in capital improvements of the transit system [\(S\)](#).

Distance-Based Road User Charges

- Drivers are charged **based on the total distance traveled**.
- Tracked using **onboard units** in vehicles that track distance traveled (odometers) and/or location via GPS.
- **Not yet deployed widely for passenger vehicles**, but have gained traction for **heavy-duty vehicle** tolling.
- **Payment methods vary widely**, from apps to web portals to fees calculated and paid at vehicle inspection.
- Many jurisdictions are still experimenting with different technologies to find the most secure, efficient solutions.



A few states are implementing RUC schemes. **Virginia's mileage choice program** has gained traction with drivers. **Over 7,000 participants enrolled in the first months** [\(S\)](#). The program let drivers forgo low-emission vehicle fees to pay by the mile, tracked using an onboard device [\(S\)](#). If they drive less than the average driver, they save money.

Roadway pricing is part of the broader mobility payments ecosystem and can work synergistically with other policies.

Similarities to other mobility payment types



Same objectives

Customers pay a price to receive a mobility service, and the money is used to support mobility infrastructure.



Similar transactions

High volumes of low-value payments, with parallel issues around interchange rates, customer account management, discounts, etc.



Similar or the same stakeholders

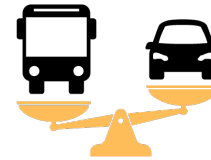
Local DOTs, transit operators, and municipalities are the asset owners, and frequently contract operations to private companies and transaction processors.

Synergies with other mobility policies



Revenue cross-subsidization

Tolling revenue can cross-subsidize other transit operations in the same region, like in congestion pricing schemes.



Holistic mobility behavior control

Tolls are an incentive to change travel behavior and altering the relative price of modes (via transit pricing, parking costs, rideshare surges, etc.) can lower congestion and emissions from cars.



Potential economies of scale

Transportation authorities could combine transit fare payment and toll processing systems, allowing payments for car and transit mobility using common infrastructure and accounts.

A few key trends will continue to shape the roadway pricing market as it evolves over the coming years:

Ongoing **debate** about paying for car **usage** instead of car **ownership**

Shift from traditional barrier-based tolls to **seamless payments and new technology**

Growing emphasis on **emissions reduction** and transportation demand management

Increase in **interoperability of payment** options between regions and mobility modes

