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California and USA Pricing Strategy Experiences

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16. Abstract
This white paper examines the successes and failures of road pricing strategies in California and the United States, with implications for congestion pricing across California. It evaluates nine case studies spanning feasibility studies, operational HOT lane programs, and the country's first large-scale cordon pricing zone. We address the conditions that favor pricing, barriers, outcomes, and how costs and benefits are distributed using case studies in Los Angeles, San Diego, San Francisco, San Mateo County, Alameda County, New York City, and Northern Virginia. We find that successful pricing programs have sustained political champions, state enabling legislation, and benefits visible to identifiable users. Revenue allocation, not toll structure, is the primary determinant of whether pricing is regressive or progressive. No pricing program reviewed was repealed after implementation. We conclude that advancing road pricing in California will require clear state leadership and supportive coalitions.

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Table of Contents

Table of Contents

List of Tables

List of Figures

List of Abbreviations

ADA	Americans with Disabilities Act
BAIFA	Bay Area Infrastructure Financing Authority
BRT	Bus Rapid Transit
C/CAG	City/County Association of Governments of San Mateo County
CalSTA	California State Transportation Agency
CARB	California Air Resources Board
CBOs	Community-Based Organizations
CH4	Methane
CO2	Carbon Dioxide
CRP	Carbon Reduction Program
CRZ	Congestion Relief Zone
CTB	Commonwealth Transportation Board
DOT	Department of Transportation
DTLA	Downtown Los Angeles
ETL	Express Toll Lane
FHWA	Federal Highway Administration
FY	Fiscal Year
GAO	U.S. Government Accountability Office
GHG	Greenhouse Gas
GP	General Purpose
HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle
IIJA	Infrastructure Investment and Jobs Act
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Institute of Transportation Studies
JPA	Joint Powers Authority
LADOT	Los Angeles Department of Transportation
LIRR	Long Island Railroad
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
MTA	Metropolitan Transportation Authority
MTC	Metropolitan Transportation Commission
N2O	Nitrous Oxide
NRDC	Natural Resources Defense Council
NVTC	Northern Virginia Transportation Commission
PM2.5	Particulate Matter < 2.5 Micrometers
RFP	Request for Proposals

RTP	Regional Transportation Plan
RUC	Road User Charge
SANDAG	San Diego Association of Governments
SCAG	Southern California Association of Governments
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SMCEL-JPA	San Mateo County Express Lanes Joint Powers Authority
SMCTA	San Mateo County Transportation Authority
SOV	Single-Occupancy Vehicle
START	Savings Through Access to Regional Transportation
TA	Transportation Authority
TAP	Transit Access Pass
TBTA	Triborough Bridge and Tunnel Authority
TMA	Traffic Mobility Act
TMRB	Traffic Mobility Review Board
TRS	Traffic Reduction Study
UC ITS	University of California Institute of Transportation Studies
UCLA	University of California, Los Angeles
USDOT	United States Department of Transportation
VDOT	Virginia Department of Transportation
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VRE	Virginia Railway Express
VTA	Santa Clara Valley Transportation Authority

Executive Summary

Executive Summary

This white paper examines the successes and failures of road pricing strategies in California and the United States, with implications for the pursuit of congestion pricing across California. It combines a review of peer-reviewed research and federal program evaluations with nine case studies spanning feasibility studies, operational high-occupancy toll (HOT) lane programs, and the country's first large-scale cordon pricing zone. The goal is to understand not only why pricing projects succeed but what lessons can be drawn from those that stall or fail.

What Existing Research Shows

Our literature review addressed four questions:

- What are the conditions under which congestion pricing has come to fruition in the United States?
- What are the identified barriers to congestion pricing?
- Where congestion pricing has been implemented, what measurable outcomes it has achieved?
- Which groups tend to be winners and losers with respect to congestion pricing?

On conditions: Federal authorization is necessary but not sufficient. Programs advance when they have executive champions willing to absorb political risk, state enabling legislation that limits veto points, and benefits that are tangible and visible to identifiable users.

On barriers: Public resistance is driven less by income or frequency of driving than by psychological factors. These include whether peers support the program, whether individuals expect to benefit personally, and whether they believe pricing will actually reduce congestion. Pricing creates concentrated, visible costs for identifiable groups while spreading benefits broadly, an asymmetry that systematically advantages opponents over supporters unless program design compensates for it.

On outcomes: Dynamic pricing produces clearer shifts in travel behavior than flat fees. A small reduction in peak-period traffic volume produces disproportionately large improvements in traffic flow. Managed lanes also require transit co-investment to generate transit benefits; high-occupancy vehicle (HOV) to HOT conversions alone do not benefit transit and can harm it if lanes become congested.

On equity: Revenue allocation, not toll structure, is the primary determinant of whether pricing is regressive or progressive. Income-based assistance, accessible payment systems, and transit investment built in from the start are more effective, politically and socially, than reactive mitigation.

What the Case Studies Show

The nine cases span Southern California, the Bay Area, New York, and Virginia.

The Southern California Association of Government's (SCAG's) Westside Go Zone produced a technically sound cordon pricing proposal that collapsed politically because the conditions for official support had not been built. No solid allies existed before the study was published, and no engagement strategy carried the concept beyond the report. The Los Angeles Metropolitan Transit Authority's (Metro's) ExpressLanes have operated successfully for more than a decade, generating over $186 million in transit investments, demonstrating that pricing can function and remain popular in one of the most congested regions in the country. But network expansion has been slow, constrained by political reluctance to convert general purpose (GP) lanes.

Metro's Traffic Reduction Study has modeled an equity-centered cordon approach using mobility wallets and demonstrated a nearly 15% improvement in job access for Equity Focus Communities, a promising framework for linking congestion reduction and equity.

The San Diego Association of Governments (SANDAG) staff proposed a Road User Charge under a compressed timeline ahead of an election and without sufficient SANDAG board engagement; the board removed it. SFCTA's downtown congestion pricing study was interrupted by COVID and remains unfinished.

In the Bay Area, San Mateo's US-101 Express Lanes consistently deliver 10 to 11 mph speed advantages over adjacent GP lanes, with an equity program, the Go Card, that has been refined over time.

The I-880 Express Lanes have met operational performance targets, but post-pandemic revenue has underperformed forecasts and state ambiguity about GP lane conversion has stalled completion of the regional high-occupancy toll (HOT) network.

New York City's Congestion Relief Zone is the clearest national proof of concept available: 11% fewer vehicle entries, 6.1% lower greenhouse gas emissions, 8% more bus ridership, and at least $500 million in first-year net revenue, achieved by tying pricing to a transit funding crisis and embedding enabling legislation in the state budget. Virginia's I-66 converted from high-occupancy vehicle (HOV) to dynamically priced HOT lanes in 2017 and has delivered reduced vehicle volumes, higher person throughput, faster travel times, and a growing revenue stream, driven by strong executive leadership and a carefully negotiated interagency agreement.

Lessons for California

Several lessons are clear. Pricing programs advance with support beyond the initiating agency, and multiple champions are needed to sustain a proposal over the long timelines pricing typically requires, since the officials who first championed a pricing concept rarely see it through implementation. Pricing framed as congestion reduction has proven more politically palatable in California than pricing framed as revenue generation, and

there is no documented case of a pricing program being repealed after implementation. Planning efforts, backed by state or federal initiative, are more likely to succeed than efforts led by a single agency alone. Both the Legislature and the California State Transportation Agency (CalSTA) and the California Department of Transportation (Caltrans) will need to take a clearer pro-pricing position for pricing to move forward more expeditiously in California, since local agencies are otherwise left to fight these political battles largely on their own. Programs also succeed more often when the problem is clearly defined before pricing is proposed as the solution, with congestion relief rather than climate or vehicle mile traveled (VMT) goals anchoring the public case. And equity concerns are predictable: Programs that address them proactively fare better than those that leave an opening for opponents.

California has demonstrated it can implement road pricing. Moving from isolated successes to a program that meaningfully reduces congestion, emissions, and inequity will require clear state leadership and direction from state agencies and the Legislature, alongside proactive equity strategies and coalitions durable enough to survive political transitions.

Contents

1. Introduction

1.1: Purpose and Scope

This white paper was prepared as part of the California Department of Transportation (Caltrans) Carbon Reduction Program (CRP), in which the Pacific Southwest Region University Transportation Center (UTC) is assisting Caltrans with understanding how road pricing in general, and priced managed lanes in particular, can reduce transportation emissions in California. This white paper highlights the successes and failures of lane pricing strategies and what contributed to their success or failure, utilizing case studies from California and other states in the United States.

This paper uses the definition of managed lanes established in a separate but companion white paper, Task 1.1: *Road Pricing Strategies*, and defines success as the implementation of road pricing intended to influence demand while focusing on the strategies involved that led to those successes (or failures). Case studies were developed with an eye for what is applicable to the California context, focusing mostly on the implementation of high-occupancy toll (HOT) lanes on state highways which allow solo drivers to pay a variable toll to access lanes otherwise reserved for carpools or buses. This paper explores what the policy barriers to pricing have been, and how they have (or have not) been overcome.

1.2: Organization

This paper begins with an overview of relevant findings from a literature review focused on research analyzing what drives the success and failure of road pricing in the United States. The paper then details case studies, beginning with those in Southern California, then Northern California, and finally New York and Virginia. Key takeaways follow.

1.3: Methodology

In the selection of nine case studies, the authors cast a broad net for projects ranging from studies to pilots and programs that included pricing through lane conversion, lane addition, or both. Some examples of cordon pricing strategies (cordon or zone pricing are charges for driving within or into a defined congested area within a city). These are included in this paper, since potential cordon pricing programs in California could be proposed on Caltrans facilities. The authors then considered how recent the programs were, the availability of both qualitative and quantitative information, and the potential for applying lessons to California. The list of case study selections was finalized with Caltrans staff before proceeding. Desktop research was conducted first, relying primarily on agency-issued reports, presentations, and plans, including board reports, along with relevant news and media coverage. Finally, select interviews were conducted with individuals with knowledge of the study or program and who were able to speak candidly about it, including representatives of pricing

efforts for the Southern California Association of Governments (SCAG) the San Diego Association of Governments (SANDAG), the I-880 Express Lanes, and the US 101 San Mateo County Express Lanes program. The case studies contain a summary of the study or program, followed by a description of its origin and objectives, metrics and performance, engagement, equity, political considerations, and project successes, challenges, and key lessons learned. With regard to metrics and performance, the case studies attempt to address traffic congestion, mode shift, economic value, costs, and revenue, when information was available.

2. Literature Review Findings

This literature review provides analytic support for the case studies in this white paper. It draws on peer-reviewed academic articles, federal agency reports, and government program evaluations. Some key sources are used across multiple research questions.

This review focuses on congestion pricing. According to Deakin (1996) congestion pricing "is a policy designed explicitly to help the transportation system and the economy function more efficiently by persuading those with the lowest values of time not to use the system during peak periods." The Federal Highway Administration (FHWA) defines congestion pricing as strategies "aimed at shifting travel demand away from peak period travel and/or to alternative travel modes" (Samdahl, Grenzeback, and Swisher, 2013, p. 3). In both these definitions, the goal is to shift demand away from congested roadways.

There is an economic logic to congestion pricing as individuals' choices whether or not to drive on a specific road at a certain time impacts all drivers when an additional (marginal) car creates congestion that all drivers on that road experience. Parry et al. (2007) noted in the *Journal of Economic Literature* that congestion pricing "involves charging motorists the difference between marginal costs to all drivers and average travel cost to the individual at a point in time." The price (ideally) is then set equal to the delay cost that the marginal driver imposes on all other drivers. This internalizes an externality that unpriced roads do not intrinsically account for. In other words, well-designed congestion pricing ensures that each driver pays a price that accounts for the social cost of their marginal trip.

Effective congestion pricing should vary based on demand, where the price is adjusted by time of travel, location of roadway, or level of congestion. Road user charges or vehicle miles traveled (VMT) fees that apply a fixed flat rate that are not adjusted based on travel demand or location do not provide this signal and might be better characterized as revenue instruments than congestion management tools.

Congestion pricing may serve multiple purposes: managing vehicle flows on congested corridors, limiting demand to meet greenhouse gas reduction targets, and generating revenue for transportation investment. The price signal leads some travelers to shift modes, routes, or departure times.

This review covers two main forms of congestion pricing: managed lanes and cordon pricing. Managed lanes apply pricing to designated lanes on a specific highway facility. The most common form is the high-occupancy vehicle (HOT) lane, Express HOT lanes may be newly constructed priced lanes or conversions of existing high-occupancy vehicle (HOV) lanes. Cordon pricing charges vehicles that enter a defined geographic area, typically a central business district, during peak periods. The FHWA classifies both managed lanes (priced lanes) and cordon pricing (zone-based or area charges) as forms of congestion pricing (Samdahl et al., 2013). This literature review covers both, though they are institutionally and operationally distinct. Managed lanes are administered by state departments of transportation (DOTs) or toll authorities at the facility level. Cordon pricing operates at the district or area level and requires coordination among multiple agencies.

This review is organized around the following four research questions:

- What are the conditions under which congestion pricing has come to fruition in the United States?
- What are the identified barriers to congestion pricing?
- Where congestion pricing has been implemented, what measurable outcomes has it achieved?
- Which groups tend to be winners and losers with respect to congestion pricing?

2.1: Conditions: What are the Conditions Under Which Congestion Pricing Has Come to Fruition in the United States?

Historical Background

Carpool (HOV) lanes became common on American urban freeways during the 1970s and 1980s. They were established initially as a fuel conservation measure after the 1973 oil embargo. By reserving highway space for vehicles with two or more occupants, they were an incentive for people to drive with others as well as a way to move more people per lane. Poole (2020), tracing the history of HOV and HOT lanes in the United States, notes that the precursor to the HOV lanes were dedicated bus lanes that appeared in the late 1960s and early 1970s. These included a busway on Shirley Highway in Northern Virginia (1969) and the El Monte Busway on the San Bernardino Freeway (I-10) in Los Angeles (1973). Given that the busways were not always in use (i.e. they had excess capacity), they were opened and made available for carpooling. Initially they required four people (HOV-4) but shifted to HOV-3 or HOV-2 in different corridors as usage patterns changed, and transportation agencies tried to balance lane utilization by encouraging people to shift to carpools.

Congestion pricing in the form of HOT lanes or Express Toll Lanes (ETL) emerged out of these examples. By the mid-1990s, the early HOV lanes generally were either underused (had excess capacity) or overused (were congested). As Poole (2020) noted, these concerns “led to the emergence of high-occupancy toll (HOT) lanes." The HOT lane concept opened excess capacity in each lane to solo drivers willing to pay a toll.

As of November 2022, throughout the United States there were a total of 125 toll roads in operation. Nearly one-third (39) were classified as HOT or ETL and had dynamic tolls that were adjusted based on the level of congestion (Farias, Zhu, and Mardan, 2024).

Finding 2.1.1: While Federal Authorization Is Necessary, on Its Own It Was Not a Sufficient Condition for Pricing Projects to Move Forward.

The 1991 federal surface transportation act known as ISTEA created the legal foundation for priced managed lane demonstrations by allowing variable pricing on Interstate highways and establishing the Congestion Pricing Pilot Program (Deakin et al., 1996). The first priced managed lane in the United States opened in 1995 on State Route 91 in Orange County, California. This project was a new facility built and operated by a private entity, with tolls that varied by time of day.

The first known conversion of an existing HOV lane to a HOT lane opened in December 1996 on Interstate 15 in San Diego, where spare capacity in the HOV lanes was opened to drivers paying a monthly permit fee, replaced by dynamic per-trip pricing in 1998. The San Diego example was the earliest HOV to HOT conversion and part of the FHWA's Congestion Pricing Pilot Program, which led to the agency's national framework for how HOT lanes were ultimately designed and enabled. After San Diego's dynamic toll road in 1998, the next dynamic toll road was built in 2005 on Minneapolis' I-395/US 12 HOT Lanes (Farias, Zhu, and Mardan, 2024).

Subsequent federal programs, such as the Value Pricing Pilot Program, Urban Partnership Agreements, and Congestion Reduction Demonstration Program, provided permission, incentives, and funding for project development and implementation across the country.

KT Analytics and Cambridge Systematics (2008) reviewed 24 pricing projects funded through the FHWA's congestion pricing programs. They found that these federal programs had resulted in 50 pricing projects and studies across 14 states, of which 16 became operational. The report identified three categories of projects: HOT lane conversions, variable pricing on new express lanes, and regional pricing initiatives. Their paper noted that institutional issues, outreach, and the presence of project champions were decisive factors in determining which programs moved from planning to implementation: "Pricing proposals need to be perceived as benefiting drivers individually and not simply society at large."

Samdahl, Grenzeback, and Swisher (2013) examined institutional challenges in detail, finding that projects faced three recurring obstacles that needed to be tackled to move forward. These included: establishing clear leadership and authority for the project, meeting the requirements of state enabling legislation, and building the organizational structures needed to coordinate across agencies. While federal authorization set up the initial framework, programs that did not resolve these institutional questions did not advance regardless of funding availability.

Finding 2.1.2: Sustained Institutional Leadership and Visible Project Champions Are the Most Consistently Identified Preconditions for Program Success.

Across U.S. and international case studies, the presence of a sustained executive or agency-level champion (such as an elected official or senior agency leader willing to absorb political risk) is the factor most consistently associated with programs that advance from idea to implementation.

KT Analytics and Cambridge Systematics (2008), Samdahl, Grenzeback, and Swisher (2013), Schaller (2010), and Selmoune, Cheng, Wang, and Liu (2020) all identify project champions as a critical factor that enables pricing projects to move forward. Samdahl et al. (2013) found that effective champions are those who can form strategic alliances between regional and state leaders (especially legislative), not just those who advocate internally within a single agency.

Selmoune et al. (2020), reviewing eight international case studies covering both implemented systems (Singapore, London, Stockholm, Norway) and rejected proposals (Edinburgh, NYC 2008, Hong Kong, early Milan), find that every implemented system had a strong political champion who could absorb political risk.

Singapore's pricing system has operated since 1975 under sustained governmental commitment. London's system was driven by Mayor Ken Livingstone. Stockholm's trial and permanent adoption were driven by the national government.

In the United States, the New York City case illustrates both the importance of leadership and its limits. King, Manville, and Shoup (2007) argue that Mayor Bloomberg provided the kind of political leadership essential to advancing a complex pricing program. Mayor Bloomberg had a fiscal interest in securing revenue from pricing and could use the bully pulpit as mayor to frame the benefits to a broader constituency than transit riders alone. Schaller (2010) documents that Bloomberg's proposal drew support from advocacy groups, the Partnership for New York City, and environmental organizations. However, in this case, the 2008 proposal to establish a cordon zone in the city failed when the New York State Assembly did not act before a federal funding deadline.

Finding 2.1.3: State Enabling Legislation Removes Veto Points and Reduces Implementation Uncertainty.

Having state enabling legislation is a key distinguishing factor between states that advanced pricing programs and those that did not (Samdahl, Grenzeback, and Swisher, 2013). The specific legal authority required varies by state (e.g. to toll Interstate lanes, to set variable rather than fixed rates, and to retain revenues for purposes other than road construction).

The literature points out how the lack of local authority to enact pricing was a source of delay, as illustrated in the case of New York's cordon zone. In 2007, the Mayor and City Council were in support of the cordon zone. But the proposal did not move forward as it required legislative approval from both state houses. That spring when the Speaker of the Assembly did not bring the measure to a vote, it failed (Schaller, 2010). The 2019 legislation succeeded in part because it was embedded in the state budget process rather than standing alone as a transportation bill. This made it harder to block.

Shill (2025) analyzes the January 2025 launch and subsequent federal challenge, observing that programs dependent on state agency administration or federal approval remain vulnerable to executive reversal after enactment.

Finding 2.1.4: Programs Advance When They Provide Tangible Benefits to Specific Users.

KT Analytics and Cambridge Systematics (2008) synthesized data from 24 FHWA-funded projects and found that HOT lane conversions generally succeeded because they expanded travel options without removing them for anyone. Single-occupant drivers gained access to spare HOV capacity by paying a toll, while carpool users retained free access to the carpool lane (which ideally remained uncongested). At the same time the GP lanes stayed unpriced.

Schaller (2010) documents that New York City residents supported the congestion zone by a 60 to 30% margin in polling when revenues were dedicated to transit. This demonstrated that connecting pricing to visible, specific public benefits is essential to building and sustaining majority support.

Harsman and Quigley (2010) studied the Stockholm 2006 referendum where congestion pricing was decided by citizen vote after real-world experience with the system. They match precinct-level voting records to zone-level commute time savings and toll costs and found that economic self-interest based on actual experience was a statistically powerful predictor of voting behavior: "When they have experienced first-hand the out-of-pocket costs and time savings of a specific pricing scheme, they are prepared to adopt freely policies that reduce congestion on urban motorways." Before the Stockholm trial, polls showed majority opposition. After seven months of the trial, the referendum passed. The Edinburgh case, where the public vote came before any trial experience, produced the opposite outcome. The implication for program design is that demonstrations and pilot projects can build a base of experiential support among drivers and voters.

Overall, studies of congestion pricing in Stockholm, London and New York demonstrate that it typically faces public skepticism prior to implementation, though opinions typically improve after tangible benefits are realized.

2.2: Barriers: What Are the Identified Barriers to Congestion Pricing?

According to the literature, the core barriers to congestion pricing are political, institutional, and structural. These three factors also interact and reinforce each other. Equity concerns feed political opposition, which undermines the political champion whose leadership is critical, which in turn weakens the institutional coalition needed to carry legislation through to implementation. Understanding these factors separately is necessary to respond to them effectively in program design.

Finding 2.2.1: Public Resistance Is Driven Primarily by Psychological and Social Factors Rather than Income or Frequency of Driving.

In a 1992 paper, Giuliano identified a series of political problems facing pricing programs: public skepticism about whether pricing will actually reduce congestion, resistance to paying for something previously provided for free, and pressure to redirect toll revenues away from managing existing lanes. Her prediction was that tolls on new capacity (added lanes or roads) and fees specific to certain classes of road users were far more likely to succeed than wide-spread congestion pricing on existing roads. The paper described the HOT lane model that was ultimately implemented in the following decade (early 2000s).

Schade and Schlag (2003) surveyed 952 motorists across four European cities to test public acceptance of pricing as part of the EU TransPrice project. They found that three variables accounted for nearly 40% of the variance in the acceptance of pricing strategies: social norms (whether peers support the program), personal outcome expectations (whether the individual expects to personally benefit), and perceived effectiveness (whether the system will actually reduce congestion). Income and the frequency with which someone drove

explained far less variance than these other psychological factors. Of all the strategies tested, road pricing, even at times of higher congestion, was the least accepted.

Finding 2.2.2: Pricing Creates Concentrated, Visible Costs for Those Who Pay while Spreading Benefits Broadly Across a Public that Is Harder to Mobilize.

King, Manville, and Shoup (2007) applies collective action theory to the political economy of congestion pricing. They note how the costs from pricing are concentrated on identifiable, organizable groups (such as frequent peak-period commuters, drivers from outer areas, and commercial vehicle operators) each of whom has strong incentives to oppose road pricing. Meanwhile, the benefits of pricing are diffuse, accruing to all travelers through reduced congestion, to the public through reduced emissions, and to transit riders and systems. Diffuse beneficiaries have weaker incentives to mobilize into an effective coalition than those directly impacted. In short, they argue that "congestion pricing is unlikely to be politically successful unless powerful claimants benefit from the toll revenue." Their paper also explores the role of transit in political support for pricing and argues that framing pricing revenues as a transit subsidy is not likely to be successful given the "heterogeneous preferences of the region's residents" and how transit riders are too small a constituency in the U.S. to anchor a successful political coalition or constituency for pricing on their own. They note: "Even spending the revenue on regional transit improvements may do little to improve the prospects for pricing. In the United States a politically weak and unorganized minority rides public transit, which dims the chance of effective political support." They also make the argument that the solution to the geographic and political problem, is to have the revenue flow to "the cities in which the tolls are paid (and/or) the cities in which the toll payers live." They argue that by being explicit about where the toll revenues go could help elected officials who inevitably face fiscal pressure and who also answer to a full range of constituents.

Schaller (2010) documents this asymmetry in the 2008 New York case. In the pursuit of the cordon pricing in Manhattan, two-thirds support citywide was insufficient to achieve legislative passage because Assembly members representing outer-borough and suburban districts could veto the proposal. Their constituents faced concentrated costs and perceived no offsetting transit benefit. The later evidence from the project's eventual success suggests that connecting pricing to a genuine transit funding crisis, combined with embedding the legislation in the budget process, can shift this dynamic.

Finding 2.2.3: The Division of Authority Over Congestion Pricing Among Cities, States, and the Federal Government Creates Structural Vulnerabilities That Persist Even After a Program Is Enacted.

Mahendra, Grant, and Swisher (2012) provides a direct practitioner account of why congestion pricing programs that have been studied and modeled often fail to ever get built. Drawing on FHWA-organized peer-to-peer workshops with regional Metropolitan Planning Organization (MPO) planners, state department of transportation staff, and transit agency officials, the report identifies a series of barriers that limit projects from moving forward even when there are no technical limitations. The key barrier is legislative restrictions, such as the absence of authority to toll previously free or federally funded facilities. In California specifically,

this includes the Legislature's prohibition on changing occupancy requirements on existing HOV lanes when they are converted to priced lanes as well as the ongoing challenge of securing interagency agreements regarding operational responsibilities and where to allocate revenue. The report is explicit that congestion pricing "calls for a paradigm change," and its core recommendations are that short-term pilot projects, the development of political champions, the early establishment of revenue-use policy are all prescriptions for implementing pricing.

Shill (2025) analyzes the political history of the New York City Congestion Relief Zone through its January 2025 launch and subsequent federal challenge. Programs that require state agency administration or federal approval can be halted at the executive level after years of political investment. Governor Hochul's 2024 pause of the program and the Trump administration's February 2025 attempt to revoke FHWA approval under the Value Pricing Pilot Program agreement both demonstrate that executive reversal is a structural feature of urban transportation governance, not an exceptional political event. Shill argues that "making urban transportation policy in the shadow of an uncooperative gubernatorial or presidential administration is the norm, not the exception, and cities must be strategic."

Finding 2.2.4: Equity Concerns Arise Predictably in HOT Lane Planning and, if Not Addressed Proactively, Will Be Used to Oppose Pricing Programs.

Weinstein and Sciara (2006) reviewed eleven U.S. HOT lane planning projects and found that equity concerns that HOT lanes were "Lexus lanes" serving only wealthy drivers arose in nearly every case regardless of whether the empirical evidence supported the concern that the users were primarily wealthy drivers.

In Maryland, a US Route 50 HOT proposal was canceled by the governor in direct response to equity framing despite limited evidence of regressive outcomes. Weinstein and Sciara found that practitioners were routinely unprepared to address equity concerns analytically, leaving programs politically exposed to opposition claims they had not anticipated and had not developed frameworks to counter.

2.3: Outcomes: Where Congestion Pricing Has Been Implemented, What Are the Measurable Outcomes It Has Achieved?

In general, congestion pricing affects travel behavior by inducing some drivers to shift modes, routes, departure times, or trip frequency. The specific magnitude and character of the behavior change depend on multiple variables: the type of pricing (e.g. managed lane or cordon), the regional form and spatial structure (e.g. the level of auto dependency and distances between origins and destinations), the extent of transit availability and whether pricing is paired with transit investment (which improves transit as an alternative to driving), the particular pricing technology, and corridor-specific characteristics.

Comandon and Boarnet (2025) prepared a systematic review of peer-reviewed evidence for the California Air Resources Board (CARB). Their paper finds that for light-duty passenger vehicles, a 10% increase in toll fees produces on average approximately a 3% decrease in traffic volume on the tolled facility (ranges in studies

from 0.4 to 8.3%)—a price elasticity of roughly negative 0.3. For heavy-duty vehicles, the elasticity is slightly higher, ranging from negative 0.3 to negative 0.4. Cordon-based pricing produces larger immediate reductions than facility-based pricing. Impacts vary further depending on income, trip purpose, payment method, and the modeling approach used. A key feature of urban congestion is that the relationship between traffic volume and congestion delay is nonlinear.

Litman (2017) notes that just a 5% reduction in traffic volumes on a congested highway (for example, from 2,000 to 1,900 vehicles per hour) may produce a 10 to 30% increase in average vehicle speeds. Pricing interventions that produce even modest reductions in vehicle entries or VMT can therefore generate substantially larger reductions in congestion delay.

Finding 2.3.1: Dynamic Pricing Maintains Lane Performance and Produces Behavioral Responses That Fixed or Flat-Fee Pricing Cannot.

Supernak, Steffey, and Kaschade (2003) evaluated the I-15 managed lanes in San Diego through the first three years of operation, comparing outcomes under the original fixed monthly permit structure (ExpressPass) with outcomes under dynamic per-trip pricing (FasTrak), which replaced it in March 1998. Under the fixed structure, the lane flowed freely and generated revenue, but overall travel behavior did not change significantly throughout the day: "The fixed-fee structure of ExpressPass, the preceding program, was not able to create such redistribution." Under dynamic pricing, "the FasTrak program's dynamic fee structure was able to create desirable redistribution of a portion of express lane traffic from the middle of the peak to the shoulders." Level of Service C was maintained throughout both phases, but once dynamic pricing replaced the flat fee user participation grew substantially from fewer than 1,000 participants at the end of ExpressPass to more than 7,600 by December 1999. Flat fees can keep a managed lane flowing, but real-time dynamic pricing was necessary to send the appropriate price signals to shape travel behavior (especially by shifting travel away from the peak period).

Georgia's I-85 Express Lanes illustrate the impact of setting the price too low. According to Guensler et al. (2013; as cited in Farias, Zhu, and Mardan, 2024), the lanes became congested in part because the toll price was not set high enough to prevent the lanes from becoming congested. The state subsequently shifted away from a congestion pricing strategy through HOV-to-HOT conversions and toward building new managed lanes (Casady, Gomez-Ibanez, and Schwimmer, 2020).

Florida's I-95 Express Lanes also revealed a challenge in securing political support for maintaining a high price. In this case, peak tolls rose from $2 per car at the facility's opening in August 2012 to $10 per car by March 2017. The increase in price was needed to maintain free-flow conditions. Casady et al. (2020) note how toll increases generally are approved by public officials and although high tolls are potentially economically advantageous, they are not popular politically. The political pressure then is to keep the lane prices lower than otherwise would be best from an operational perspective.

Finding 2.3.2: Performance Varies Significantly by Project Type, Thus Requiring More Project-Specific Analysis.

The most common form of pricing for U.S. programs is converting existing HOV lanes to HOT lanes without new adding lane capacity. Buckeye (2012) evaluated I-394 MnPASS in Minneapolis-Saint Paul after more than five years of operation and found that the managed lanes performed efficiently, maintained free-flow speeds, and generated sufficient revenue to cover operating costs: "The results of this analysis indicate that the lanes are performing efficiently, are continuing to ensure free-flow speeds for all users, and are enhancing vehicle and person throughput." The program was adjusted, though, when public concern arose over congestion in non-peak reverse-flow lanes. The ability to adjust to implementation problems proved as important as the initial design. When HOV-to-HOT conversion is combined with added capacity, outcomes are substantially stronger.

Buckeye (2014) evaluated I-35W MnPASS, which combined a seven-mile HOV-to-HOT conversion with four miles of new express lane construction. Vehicle throughput in the managed lanes increased 77%, and person throughput increased 39% over the pre-project baseline, with free-flow speeds over more than 95% of operating hours.

Hallenbeck, Ishimaru, and Zyuzin (2016) evaluated Washington State's SR-167 HOT lanes when the program changed from only permitting cars to enter the HOT lanes at designated points, to allowing continuous access throughout the corridor. After the access rule change, prices and total revenue increased, travel times declined (slightly) in both the managed and GP lanes. Overall, there was widespread support for this shift, and a large fraction of corridor travelers (and transit agencies) favored the change.

Casady, Gomez-Ibanez, and Schwimmer (2020) conducted benefit-cost analyses of seven U.S. toll-managed lane projects and found that only two of seven exceeded a benefit-cost ratio of 1.0 under base-case assumptions, though three others approach or exceed 1.0 under plausible alternative assumptions. The most successful projects generated time savings of approximately four to five minutes per trip for managed-lane users and smaller savings for GP lane users from reduced congestion. Projects fail the benefit-cost test primarily when congestion in the general-purpose lanes is insufficient to encourage drivers to switch to the managed lanes, or when travel time savings are modest relative to the capital and development costs to build and maintain the managed lane.

California's I-680 Southbound Express Lane was the first HOV-to-HOT conversion in Northern California and illustrates the low end of the benefit-cost range for conversion projects. Casady et al. (2020) found that the lane produced very small time savings for managed-lane users and GP lane users—far below the four-to-five-minute threshold for the more successful projects. The I-680 case suggests that HOV-to-HOT conversions in corridors with moderate rather than extreme peak congestion may not generate the time savings required to produce significant net social benefits.

The GAO (2012) review of 14 U.S. projects made a finding about person throughput that traffic performance literature often overlooks: although the number of vehicles using HOT lanes rose following conversion, there

were fewer people in those vehicles because of an increase in the proportion of toll-paying solo drivers and a corresponding decrease in carpools. This is a direct consequence of HOV-to-HOT conversion—the exclusive advantage that previously motivated carpooling is reduced when solo drivers can access the managed lane by paying.

Finding 2.3.3: To Benefit Transit, Managed Lane Projects Require Co-Investment in Transit or Transit-Supportive Policies. Cordon Pricing Produces Larger and More Immediate Transit Effects.

Gregory Newmark from the Center for Neighborhood Technology (2014) examined transit outcomes across all 12 U.S. HOT lanes operating as of early 2012. He found that projects adding new managed HOT capacity were more likely to have positive transit outcomes than those merely pricing existing HOV lanes.

Miami's I-95 managed lane project (which included both new construction and conversion) "reduced bus travel times along the corridor by 68%." HOV-to-HOT conversion-only projects can harm transit if the HOV lanes had been used by buses and they become too congested post-conversion either due to tolls being set too low and/or enforcement being poor. In either case, the bus would get stuck in congestion in the managed lane.

Denver's I-25 managed lane includes a contractual requirement that tolls must be set at or above the express bus fare along the corridor during peak periods as a way to protect transit ridership. Any degradation in bus travel times triggers a policy review and may lead to a toll increase. This is a design response to the congestion risk for transit. Programs that opened HOT lanes without corresponding transit investment showed substantially smaller ridership gains than corridors with active bus operations and park-and-ride access directly from the managed lane.

The first operational year of cordon pricing in New York City provides substantially stronger evidence of transit effects from area-wide pricing. The Metropolitan Transit Authority's first evaluation report on the Congestion Relief Zone (CRZ), found that bus speeds in the zone increased 2.3% year-over-year from January through September 2025, reversing multiple years of declining bus speeds (MTA Bridges and Tunnels, 2026). Bus ridership increased 8% year-over-year on routes serving the CRZ during the same period and subway trips increased 9% year-over-year. These transit improvements occurred alongside traffic reductions: entries to the zone and excluded roadways were approximately 11% below the historical baseline on average from January through October 2025, representing more than 21.5 million fewer vehicle entries than would have occurred without tolling.

London provides a longer historical comparison of cordon pricing and transit. Litman (2011) reports that following the February 2003 launch of the £5 per day central London charge, vehicle traffic in the charging zone declined approximately 20% in the first months of operation—roughly 20,000 fewer vehicles per day. Bus congestion delays declined 50%, and bus ridership increased 14%, reversing a prior period of decline. Subway ridership increased approximately 1% during the same period.

Finding 2.3.4: Pricing Reduces GHG Emissions and VMT, but the Magnitude for Facility-Level Managed Lanes Is Modest While Cordon Pricing Produces Larger Effects.

Comandon and Boarnet's CARB report (2025) estimates that a 10% increase in toll fees produces approximately a 3% decrease in traffic volume on the tolled facility. Cordon-based pricing produces larger immediate reductions in VMT than facility-based managed lane pricing. VMT reductions translate proportionally to greenhouse gas (GHG) reductions, making pricing one of the more cost-effective VMT reduction strategies available, but the facility-level magnitude should not be overstated.

Deakin et al. (1996) modelled pricing strategies across California's four major metropolitan areas. They found that a combined package of congestion pricing and parking charges would reduce VMT by 5 to 7% and cut fuel use and emissions by 12 to 20%. They also noted that: "Because auto use and its impacts are quite inelastic to price, sizable increases in revenue can be obtained with relatively little effect on travel; conversely price increases must be large to obtain sizable reductions in travel and its externalities."

Litman (2017), synthesizing Deakin et al., found that the congestion delay reduction from pricing is substantially larger than the VMT reduction it produces. A 10-cent per vehicle-mile congestion fee in Southern California was predicted to reduce VMT by 2.3% while reducing congestion delay by 22.5% (a ratio of nearly 10 to 1). This pattern reflects the nonlinear nature of congestion. Small reductions in peak-period volume produce disproportionately large improvements in traffic flow. Among the instruments modeled (including parking fees, VMT fees, fuel taxes, and emission fees) congestion pricing was the most effective at reducing congestion delay per unit of revenue.

The recent New York City Congestion Relief Zone evaluation report provides the first post-implementation GHG data for a U.S. cordon pricing scheme (MTA Bridges and Tunnels, 2026). It indicates that total GHG emissions decreased 6.1% year-over-year in the CRZ from January through September 2025. The report also found no significant change in PM2.5, nitrogen oxide, or nitrogen dioxide levels in the broader region during the same period and concludes that the program is "meeting the objectives of the Central Business District Tolling Program with fewer adverse effects than predicted during the environmental review." It should be noted that a peer-reviewed study using data from 42 street-level air quality monitors found a 22% reduction in daily maximum PM2.5 concentrations within the CRZ during the first six months of tolling, with smaller but measurable reductions across the five boroughs and the broader metro area. This suggests that zone-level air quality benefits may be larger than regional averages capture (Fraser et al., 2025). The MTA review noted that vehicle speeds within the zone and on crossings also improved: 4.6% year-over-year within the zone and on excluded roadways, and 23% year-over-year on average during the morning peak on crossings.

London's experience adds a longer-run comparison. Litman (2011) reports that average traffic speeds in the central London charging zone increased 37% after the 2003 charge introduction (from approximately 8 miles per hour to 11 miles per hour). Peak-period congestion delays declined approximately 30%. Over the longer term, Litman (2017) reports in a later paper that vehicle trips in the London zone have fallen 17% from pre-charge levels, and congestion measured in person-hours of delay per mile traveled has fallen 26%.

Finding 2.3.5: Safety Evidence From Managed Lanes Is Limited but Does Not Indicate Increased Risk.

Abuzwidah and Abdel-Aty (2024) conducted the first comprehensive safety analysis of U.S. express lane operations, examining 55 miles of Florida managed lanes. They find that converting HOV lanes to express lanes does not compromise overall freeway safety. Crash modification factors for the managed lanes are below 1.0, indicating fewer crashes than under the prior HOV baseline. Crashes in adjacent GP lanes increased post-conversion, which the authors attribute to redistribution of risky driving rather than a net increase in overall crash risk. The study also found that electronic toll collection independently reduces crashes, a benefit that accompanies HOT lane implementation regardless of lane design. International evidence on safety from pricing notes the reduction in accidents.

Litman (2019), drawing on Green, Heywood, and Navarro (2015), reported that London's congestion charging zone experienced a 40% decline in the accident rate following the introduction of pricing, with total accidents declining by approximately a third and accident rates per vehicle-mile traveled declining 22%. Total vehicle travel in the zone declined 14% over the same period.

2.4: Impacts: Which Groups Tend to Be Winners and Losers With Respect to Congestion Pricing?

To understand the winners and losers from congestion pricing requires examining three related questions: who pays the toll, what alternatives exist for those who cannot or choose not to pay, and where does the new revenue go? If exemptions or discounts for lower-income drivers do not exist and there are no viable alternatives to driving, then a pricing program can function as a regressive charge that disproportionately burdens lower-income households. On the other hand, if revenues are reinvested in transit or returned through assistance programs, the benefits can accrue more broadly, including to lower-income households.

The location of pricing also matters to winners and losers. Communities near heavily congested facilities often bear the largest air quality burden from traffic. Pricing that reduces that congestion also achieves reductions in pollution, improved travel time reliability, and reduced accidents near congested corridors. To fully understand equity then requires not just looking at who pays but also who gains with a less congested and lower-emission transportation system.

Finding 2.4.1: Revenue Allocation, Not Toll Structure, Is the Primary Determinant of Whether Congestion Pricing Is Regressive or Progressive.

What the revenue from a pricing program is ultimately spent on can contribute to whether a pricing program is regressive or progressive. Eliasson and Mattsson (2006), applying a detailed equity methodology to Stockholm's proposed congestion charging scheme, showed that the same charge would produce opposite distributional outcomes depending on how revenues were used. Without revenue recycling, the scheme was mildly regressive. With revenues directed to public transit improvements, it became progressive: "If revenues

are used for improving public transport, this will benefit women and low-income groups the most." With revenues used for income tax cuts, it substantially benefited higher earners. Their central finding: "The two most important factors for the net impact of congestion pricing are the initial travel patterns and how revenues are used. Differences in these respects dwarf differences in other factors such as values of time." They also found that total collected charges would be more than three times as large as the net efficiency benefits, meaning redistribution decisions are quantitatively more consequential than the efficiency gains that are conventionally used to justify pricing.

Kristoffersson, Engelson, and Borjesson (2017) extended this analysis by examining the trade-off between efficiency and equity across multiple charging designs for Stockholm. They found that the efficient pricing system designed for Stockholm was also the least equitable as the benefits accrued more to higher income residents. This was due to the spatial distribution of jobs and housing whereby higher income populations tended to live in or closer to employment areas. In the case of Stockholm, higher income residents faced less congestion in their origin/destination pairings as they were more likely to live and work in the center or north while lower income residents were more likely to live in the south and commute north. This gave higher income residents more time savings relative to what they paid. Among various revenue recycling strategies analyzed, income tax cuts benefited high-income groups substantially more than transit investments or lump-sum redistribution. But the authors note that if revenues are spent on public transport (especially bus systems) they are more likely to reduce the negative distributional effects.

In an earlier paper, Small (1992), modeled congestion pricing for the Los Angeles region, finding that the revenue generated by pricing is large enough to more than offset average individual losses if directed strategically. Small noted that if road pricing replaces regressive sales and fuel taxes, then it is possible to offset some of the regressive distributional impacts for most residents by spreading the benefits of pricing more widely.

The International Transport Forum (2018) synthesized evidence from a roundtable on the social impacts of road pricing. They found that "while levies that increase the cost of using cars, such as congestion charges, parking fees and fuel taxes can be regressive, they have been found to be progressive in some circumstances." The roundtable also noted that the revenues raised by road pricing are typically larger than the direct benefits to drivers, and that "the biggest benefits fall to the community more widely, including people using public transport." This reframes the equity question more towards a comparison between who pays tolls and who gains transit improvements rather than a comparison of toll payments alone between income groups.

Litman (1996) estimated negative externalities from automobiles (accidents, pollution, parking, noise, and resource consumption) at between 10 cents to over 30 cents per vehicle mile. Because most road pricing proposals would generate less revenue than these externality estimates, one approach to equity (horizontal equity) would allow the revenues to go to other uses and not necessarily be returned exclusively to drivers. In fact, when looking more fully at externalities, drivers as a class would need to compensate others before any claim to revenue arises. This supports directing funds to transit, low-income assistance, or programs that address the harms driving imposes. Litman also notes that most existing transportation taxes used to fund

highways (e.g. fuel taxes, use fees, sales taxes, and property taxes) are already regressive. Replacing them with road pricing revenue would have a neutral or positive distributional effect.

Finding 2.4.2: While Managed Lanes Do Not Serve Only High-Income Users, Affordability Constraints on Lower-Income Users at High Toll Levels Are a Real and Distinct Concern.

Poole (2020) reports that non-luxury vehicles accounted for 67% of HOT lane transactions on I-405 in Washington State, and most program evaluations find vehicle distribution in managed lanes broadly comparable to the general fleet. The FHWA (2008), in its Income-Based Equity Impacts of Congestion Pricing primer, reviews evidence from multiple priced lane programs and finds that "the data from priced lanes have shown that a wide range of income groups use the lanes at different levels of frequency of use." The use of congestion-priced lanes by both high- and low-income users appears to be selective: it is based on the value of a specific trip, not solely on income.

Harsman and Quigley (2010) in analyzing the Stockholm trial found that acceptance was strongly predicted by actual time savings and cost experience rather than income. When voters experienced the pricing system first-hand, self-interest based on actual costs and benefits was a more powerful predictor of voting behavior than political ideology.

Weinstein and Sciara (2006) note that the relevant question is not whether lower-income commuters use managed lanes (since they do) but whether they can afford reliable access as frequently as higher-income commuters when tolls rise to substantial levels during peak periods. They write that "HOT lanes' impacts on low-income travelers are more complex than many planners and other community stakeholders to date have acknowledged." This is a question about budget constraints and frequency of access, not a binary question about whether low-income users use the lanes at all.

West and Borjesson (2020) evaluated Gothenburg, Sweden's congestion charges and found that low-income citizens pay a larger share of income than high-income citizens. This is due in part because high-income workers have substantially greater access to employer-provided cars, meaning congestion charges can be partially tax-deductible for them but not for lower-income workers.

Litman (1996) notes that lower-income people drive fewer miles on average than higher-income people, especially on the suburban highways that are primary candidates for managed lane pricing. As a group, lower-income households would therefore pay relatively little in tolls. But it would be important to provide relief for lower-income automobile-dependent households without viable alternatives who use those corridors. A study of the impacts of tolling Puget Sound region highways, cited in Litman (1996), found that most poor households would not be substantially affected, but that for a small number of low-income households without travel alternatives, the financial effect of tolling could be large. In one hypothetical simulation, a poor household could pay up to 15% of its income on tolls.

Finding 2.4.3: Income-Based Assistance Programs Are a Feasible and Established Mechanism for Mitigating Affordability Concerns, and Comparable Programs Already Operate in Electricity and Water Utilities.

Manville, Pierce, and Graveline (2022), using data from California's six largest metropolitan areas, estimated that approximately 13% of households are both economically vulnerable (income below 200% of the federal poverty level) and likely to be regularly exposed to freeway congestion charges. They compared this to the share of Californians eligible for food assistance (14%) and the share receiving utility rate subsidies (25 to 30%) and argue that "the equity problem posed by pricing would be manageable." They propose that discounted utility meter pricing programs for electricity and water networks —for which there are no substitutes—provide applicable models. "The market for road space, in contrast, basically does not exist. Nor is one likely to arise unless the government creates it. These circumstances offer an opportunity for holistic market design: both the market and its redistribution mechanism can be jointly created."

The FHWA (2008) identified a specific practical barrier in this context. They noted that when pricing systems rely on electronic toll collection, households without credit cards or bank accounts face barriers to establishing transponder accounts. In situations where transponder users pay a lower rate than those paying by video toll or at a booth, low-income households that cannot afford the deposit may effectively face higher per-trip prices than wealthier households. Several states and programs have addressed this through cash replenishment options at retail locations or prepaid accounts that do not require a credit card. The FHWA primer identifies this as one of several program design choices (alongside income-based discounts and transit investment) that planners should address proactively to prevent this equity concern from becoming a political vulnerability.

Finding 2.4.4: Geographic Equity (Which Is Different From Income Equity) Is Generally Underexamined in the US Literature but Could Be a Factor in California Due to Its Diverse Regional Economies.

The GAO (2012), reviewing 14 evaluated U.S. pricing programs, identified income equity and geographic equity as two distinct dimensions. Geographic effects (whether particular areas bear costs without commensurate benefits, especially when traffic diversion occurs on toll-free parallel routes) have rarely been evaluated systematically. The report notes that equity concerns may become more acute where pricing is used not only to manage congestion but also to raise revenue for new projects. They write that "raising revenue can be at odds with managing congestion" because the corridor generating the revenue may not be the corridor receiving the investment.

Kristoffersson, Engelson, and Borjesson (2017) show that the efficiency-equity trade-off in Stockholm arises directly from the spatial mismatch between where lower-income and higher-income residents live relative to employment centers. This is a dynamic that also exists in and between California metropolitan regions.

The International Transport Forum (2018) recommends differentiating charges by time and location as the primary tool for minimizing distributional impacts: "Fine differentiation of pricing by time of use allows traveller's to select their preferred departure time to match their willingness to pay. This enables most users to

adjust travel patterns rather than be priced off the road, minimising distributional impacts." The roundtable also recommends combining road pricing with public transport planning, noting that "where alternatives to car use are inadequate, major investment in public transport systems and pedestrian and cycling infrastructure is called for."

3. Case Studies

This white paper includes case studies from four areas: Southern California (four cases), the Bay Area (three cases), New York (one case), and Virginia (one case). The cases are summarized in **Table 1** below.

Table 1. Summary of Case Studies

Case	Type	Status	Primary Goal	Pricing Structure
SCAG Mobility Go Zone	Cordon Pricing	Study Published (2019); not Implemented	Congestion Reduction; Mode Shift; GHG/Carbon Reduction	Proposed: ~$4 Flat Entry Fee
Metro ExpressLanes	HOT Lanes	Implemented since 2012	Congestion Reduction; Traffic Flow Improvement	Variable/Dynamic
Metro Traffic Reduction Study	Cordon Pricing	Feasibility Study in Progress	Congestion Reduction; VMT Reduction; Equity	Proposed: Variable, with Mobility Wallets for Low-Income
SANDAG Road User Charge	Road User Charge	Proposed; Removed by Board Vote (2022)	Revenue Generation; VMT and GHG Reduction	Proposed: Flat per-Mile Fee
SFCTA Downtown Study (San Francisco)	Cordon Pricing	Study begun (2019); Not Completed or Implemented	Congestion Reduction; Mode Shift; Equity	Proposed: Variable
San Mateo 101 ExpressLanes	HOT Lanes	Implemented since 2022	Congestion Reduction; Person Throughput; Carpooling	Variable/Dynamic
I-880 ExpressLanes (Alameda)	HOT Lanes	Implemented	Congestion Reduction; Regional HOT Network	Variable/Dynamic
NYC Congestion Relief Zone	Cordon Pricing	Implemented January 2025	Congestion Reduction; MTA Capital Revenue Generation	Variable
Virginia I-66 HOT Lanes	HOT Lanes	Implemented since 2017	Congestion Reduction; Mode Shift	Variable/Dynamic

3.1 Southern California: Southern California Association of Governments: Mobility Go Zone and Pricing Feasibility Study

Summary

In March 2019, the Southern California Association of Governments (SCAG) published the Mobility Go Zone and Pricing Feasibility Study Final Report ("GoZone Report") (SCAG, 2019). This report explored the concept of a "Mobility Go Zone," which would pair cordon pricing with a suite of other mobility service options for commuters, visitors, and residents to reduce Greenhouse Gas Emissions by reducing VMT and Vehicle Hours Traveled (VHT). The feasibility study evaluated numerous potential cordon pricing zones across Los Angeles County against factors including arterial congestion delay, technical feasibility, and potential support from the public and local governing agencies.

Based on this evaluation, the West Side of Los Angeles, including part of the City of Santa Monica (See **Figure 1**) was determined to be the most promising location in the county for a Mobility Go Zone pilot program. The objectives of such a zone were to encourage drivers to shift travel patterns to shared modes and/or to shift less time sensitive or lower value trips to off-peak times resulting in more evenly distributed congestion.

To determine the efficacy of this West Side alternative, SCAG conducted a travel demand analysis on an approximately $4 "decongestion" fee on vehicles entering the zone during peak traffic periods (6–9 a.m. and 3–7 p.m.), with discounts for residents of the zone and low-income travelers, that was designed to encourage drivers to shift travel patterns to shared modes or off-peak times

In line with existing California law on corridor-specific reinvestment, the model assumed revenues generated by the fee would fund local transportation improvements that reduce congestion and carbon emissions and offer improved travel options to residents, commuters, and visitors to the area. The model also assumed enhanced mobility options in the zone, including more bus circulator and commuter express routes, micro-transit options, and improved bike and pedestrian infrastructure. The analysis anticipated peak period improvements for VMT and VHT by 21–22% and 24% respectively, and overall drops in daily VMT and VHT by 8% and 10% respectively.

When SCAG's report was made public, it was met with strong public criticism by Los Angeles City Councilmember Mike Bonin, whose 11th district covered the West Side southwest of Interstate 405 and included portions of the proposed zone. SCAG suspended further efforts to move forward with this specific concept and has since pivoted its approach to focus on creating conditions to support a statewide road charge.

Figure 1. Outline of West Side Mobility Go Zone from Final Report

Study Origin and Objectives

SCAG's Go Zone study was a culmination of several earlier studies, beginning with its 2013 Express Travel Choices Study, which reviewed a wide range of congestion pricing options for their potential applicability to the SCAG region. In 2011, SCAG, Caltrans, and the Los Angeles Metropolitan Transit Authority (Metro) the region's largest transit provider, received a Value Pricing Pilot Program 2010 Grant Award to support the pre-implementation of value pricing alternatives in the SCAG region. Based on the three primary objectives of 1) reducing congestion, 2) improving air quality and reducing GHG emissions, and 3) creating new sustainable sources of revenue for transportation investment, the study recommended two pricing concepts for further analysis: an express lane network and cordon pricing.

The Go Zone study was designed to identify the most promising geographic area and system design for initial testing of cordon pricing in the SCAG region, and staff also hoped that the study would influence an implementing agency to come forward to deliver and test a pilot program based on its findings. After an iterative screening process, additional evaluation and refinement, the study ultimately put forward a cordon pilot program in West Los Angeles for its proof-of-concept/feasibility analysis.

Traffic Congestion: VMT and VHT

The Go Zone report identified VMT and VHT as core congestion performance metrics. The feasibility analysis predicted a 22% reduction in VMT during the morning peak, and 21% during the evening peak. VMT was projected to increase by 6% during off-peak periods. The analysis predicted a nearly 24% reduction in VHT during the morning and evening peaks, resulting in an overall daily average VHT reduction of 9.6%.

Mode Choice Shift: Mode and Vehicle Occupancy

The feasibility analysis predicted that travelers choosing to drive into the study area would decrease by 19% during peak periods, including a 22% reduction in single occupancy vehicles entering the area. It projected that individuals choosing to take transit would increase by 9% and those using active transportation would increase by 7%.

Economic Value: Present Value, Benefit Cost Ratio, and Jobs

The study predicted that the overall benefits of the program, over a sixteen-year study period, would be over $1 billion in 2019 dollars, and the net benefits of the program (when considering administrative costs) would be over $667 million. This equates to a benefit/cost ratio of 3:1. Nearly 500 jobs would be needed annually to support the administration of the program, generating an estimated $54 million in total regional economic output, of which $25 million would go directly to worker wages and salaries.

Costs

The SCAG GoZone study was funded through the FHWA's Value Pricing Pilot Program grant. Capital costs associated with the program were projected for tolling and improved ancillary infrastructure. Operations and maintenance include maintenance of that infrastructure, cost of operating and maintaining an expanded bus fleet, and the cost of collecting the fee. SCAG estimated total startup capital costs at $41.9 million ($14.7 million for toll collection infrastructure and $27.2 million for transit capital) and ongoing operations and maintenance costs at $41.3 million annually.

Revenue

SCAG estimated anticipated program revenue, through the collection of decongestion fees, at $86.5 million in 2020 and $135.2 million in 2035 Plus an additional $1 to $2 million annually in additional transit fare revenue for the same period.

Engagement

SCAG refined the Mobility Go Zone Study through the aid of a public outreach initiative including traditional meetings with stakeholders, focus groups, networking events, panels, and a social media campaign called "100 Hours." The 100 Hours public engagement campaign was intended to start a public conversation regarding decongestion fees and a Mobility Go Zone Program. As part of the campaign, SCAG enlisted influential transportation leaders to publish blogs around congestion pricing.

While neither Los Angeles nor Santa Monica committed to implement the proposal, throughout the course of the study development, SCAG staff worked with the Los Angeles Department of Transportation (LADOT) and the City of Santa Monica's Transportation Director and City Manager, as well as other elected officials, to try to build a coalition in support of pricing.

Equity

Equity was a stated consideration in the study. The study assumed low-income travelers and residents within the Go Zone would be eligible for discounted decongestion fees to reduce potential financial burdens. Approximately 18% of households within the Mobility Go Zone reported household incomes of less than $25,000, and 8.2% of households did not have access to a private vehicle, including 3% of owner-occupied households and 10% of renter-occupied households, in large part due to the student and elderly population residing in the area. Within the area, only 8% of all daily travel trips were being taken by low-income individuals, but they accounted for 23.6% of all daily transit trips. This increased to approximately 30% for transit commute trips, further showing low-income commuters' reliance on transit. Only 2.2% of those driving alone were low-income.

Revenues generated by the fee were assumed to be reinvested locally to expand and improve transportation options, including enhanced bus service, microtransit, and bicycle and pedestrian infrastructure, to enhance access to affordable and reliable mobility alternatives. The analysis suggested that congestion reduction and associated improvements in travel time reliability could improve the experience of transit users and travelers with limited flexibility in their schedules. By shifting trips to shared modes or off-peak periods, the program could have improved system performance and specifically benefitted lower-income and transit-dependent travelers.

Political Considerations

The report was publicly supported by experts at UCLA, the Natural Resources Defense Council (NRDC), and then-State Assembly member Richard Bloom, who represented the area, citing the need for creative ways to address congestion (Rubin, 2019). However, while then Los Angeles Councilmember Mike Bonin was privately interested in the concept, once SCAG published the study, he became a prominent detractor (Newton, 2019). In addition to his equity concerns, Bonin tweeted that the West Side alternative was not a viable option for pricing due to its lack of existing "robust transit alternatives" (though the model did assume enhanced mobility options in the zone funded by congestion fee revenues) and the existence of other, more viable locations with existing transit investments such as downtown Los Angeles and LAX airport (Newton, 2019). SCAG's own polling suggested that support for a congestion tax peaked at forty% (Nelson, 2019).

SCAG staff noted that while they engaged with many elected officials throughout the course of the study, the tone shifted drastically once SCAG published the study. Staff surmised that the organization was not prepared with a full engagement strategy for implementing the program.

Project Successes, Challenges, and Key Lessons Learned

While SCAG staff had hoped the feasibility study would persuade an implementing agency to enact its recommended pilot, this did not occur.

A California Public Records Act request from the *LA Times* forced SCAG to publish the report earlier than planned, before staff had completed the coalition-building and engagement work they had intended to finish first. As a result, the report drew political opposition, most notably from Councilmember Bonin, before an implementing agency or political coalition was in place to defend it. Nevertheless, the report demonstrated that a cordon pricing project in Los Angeles County could be a viable approach to reduce congestion and vehicle miles and hours traveled if it had political support. It also indicated that cordon pricing could enhance the economic output of the region and provide meaningful cash flow to support localized mobility improvements.

The analysis demonstrated favorable outcomes in all key project metrics. Additionally, while the publication of the SCAG study did not result in an immediate pilot, Los Angeles Metro's Traffic Reduction Study (discussed below) built off SCAG's study. Its third round of modeling leveraged the boundary of SCAG's west side cordon zone.

SCAG staff involved with the study reflected that a successful congestion pricing program in Los Angeles will require a long maturation process with continuous outreach. Election cycles and staff turnover make this more challenging. Additionally, staff suggested that engagement and communication around a potential congestion pricing program cannot begin with pricing; instead, it must be part of a broader conversation around transportation, where pricing is offered as one potential solution. Lastly, staff opined that success requires elected officials willing to take a public stand in support of pricing and that it is the responsibility of transportation agencies to create the conditions that allow an elected official to support a controversial policy. This could mean providing a credible implementation pathway, absorbing stakeholder backlash, creating a coalition, and embedding pricing into a larger plan.

3.2 Southern California: Metro ExpressLanes Pilot and Program

Summary

Metro's ExpressLanes Program began as a 12-month pilot program, when Express Lanes were opened on the I-110 in November of 2012, and on the I-10 in February 2013. The pilot was successful enough that the Metro Board voted unanimously to keep the program in April 2014.

The program currently encompasses managed lanes on the I-10 and I-110 freeways, designed to reduce congestion and improve traffic flow (See **Figure 2**). Metro allows toll-free access to HOVs drivers (with three or more occupants), transit, and vanpools, while also offering non-HOV drivers the opportunity to pay a toll to use the lanes that varies depending on the level of demand. Pricing is set to optimize both lane utilization and

performance by targeting usage levels that are just below the carrying capacity of the roadway. Fees are collected using a FasTrak transponder with a manual switch that is used to indicate vehicle occupancy.

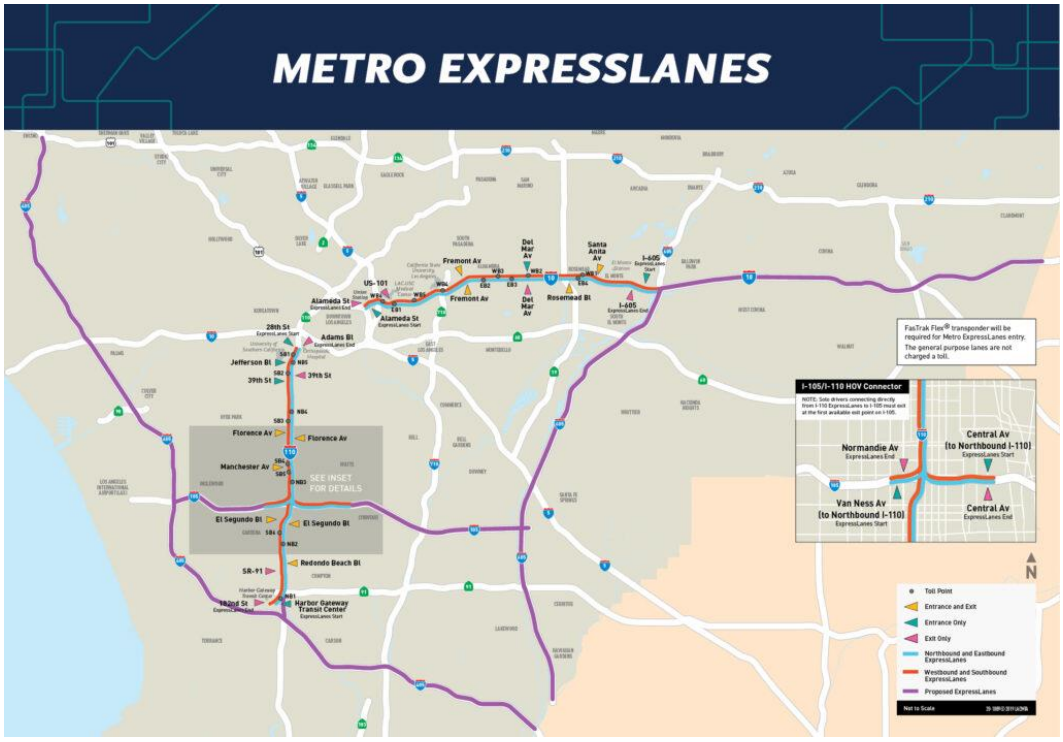

Figure 2. Map of Metro ExpressLanes

If at any given time, demand for the ExpressLanes becomes so great that the maximum toll rate (set by Metro policy) is insufficient to keep demand below capacity, the lanes temporarily revert to conventional HOV lanes until demand subsides (a transient operational condition referred to as "HOV Only" mode). In line with state law, Metro reinvests net revenues from the ExpressLanes into transit service improvements and projects along the corridor from which they were generated.

Program Origin and Objectives

Metro's congestion pricing work dates back over twenty years. In Fall 2006, Metro, along with the County, City of Los Angeles, Caltrans, and SCAG applied to the United States Department of Transportation (USDOT) Urban Partnership Agreement Program for congestion relief (Metro, 2007). Initially, LA was not selected when USDOT announced five other finalists (Twin Cities, Seattle, New York, San Francisco, and Miami). However, in spring 2008, New York dropped out, and Los Angeles was selected to replace them. Metro executed a Congestion Reduction Demonstration agreement with USDOT for $213.6M in programming, subject to Metro receiving legal authority to implement the conversion of HOV lanes to HOT lanes (Metro, 2008). By 2010, Metro had completed a technical feasibility study and detailed operating plan for the I-10 and I-110 ExpressLanes Demonstration Projects.

The 12-month pilot program began with I-110 Express Lanes in November of 2012. The I-10 Express Lanes opened in February 2013. The projects resulted in two new ExpressLanes in each direction. These new Express Lanes were created by converting existing HOV lanes and busway facilities on both corridors into two HOT lanes. In this way the project generally used existing freeway right-of-way and did not remove or convert any GP lanes to HOV or HOT. In April 2014 the Metro Board voted unanimously to keep the program and instructed staff to develop a countywide ExpressLanes Strategic Plan, which was adopted in 2017.

The 2017 ExpressLanes Strategic Plan established a vision for a system of Express Lanes for LA County using a network approach to maximize regional benefits (Metro, 2017). The objectives of the program are to, "create a more reliable, faster travel option that makes better use of existing vehicle capacity in high occupancy vehicle (HOV) lanes while addressing the degradation in HOV lane performance and providing Express Lane users with a seamless customer experience." The Strategic Plan identified three tiers of projects comprising a 621 lane-mile ExpressLanes network that would be constructed across the next 25 years, notably with a focus on dual-lane configurations. The primary focus of the ExpressLanes Strategic Plan was the conversion of existing and planned HOV lanes to Express Lanes. The plan did not consider conversion of any general purpose lanes, citing federal law. Its scope was also limited to corridors with existing or planned HOV lanes, which excluded new, stand-alone Express Lanes on freeways that had none.

Tier 1 of the plan included segments that were supposed to be implemented within 5–10 years. While some of the segments in the plan received funding through Measure M (a county-wide sales tax increase for transportation), including $175 million for the I-105 and $260 million for the I-405, there is still a significant funding gap for the I-105, and a similar gap is anticipated on the I-405. Furthermore, no other funding has been identified for the remainder of the projects included in the plan. Progress on subsequent ExpressLanes projects, including the I-105 and I-405, has been extremely slow. Only the I-105 has begun construction at this time, and that project is anticipated to open at the earliest in 2028, nearly 11 years after the completion of the ExpressLanes strategic plan and nearly 20 years after program inception. The I-10 ExpressLanes extension is in the planning/environmental stage.

Traffic Congestion: VHT

The ExpressLanes have demonstrated measurable congestion relief along the I-110 and I-10 corridors. Before conversion to ExpressLanes, carpool lanes averaged about 42 mph during peak periods. After conversion, average speeds increased to about 55 mph overall, with some segments like the I-110 showing AM peak speeds about 61.6 mph, indicating both reduced VHT and smoother vehicle flow (Jager, 2022).

Metro ExpressLanes Operations Performance Reports for FYs 2017 and 2018 (their most recent publicly available years) show ExpressLanes continuing to sustain speeds above 45 mph and travel time savings of 13–15 minutes compared to GP lanes, reporting increases in overall trips and high average speeds (Metro, 2017).

Mode Choice Shift: Mode and Vehicle Occupancy

While ExpressLanes primarily target vehicle traffic speeds, complementary transit service improvements such as Metro's J Line (formerly the Silver Line Bus Rapid Transit), vanpools, and new buses have boosted multimodal use, with over 100 vanpools added along the ExpressLane corridors as of 2022 (Jager, 2022). The J Line runs on separated freeway high-occupancy lanes along the I-10 and I-110 Freeways—the same lanes that were converted from carpool-only to toll lanes. When it opened in 2009, buses ran every 30 minutes. With the ExpressLanes project, Metro purchased 59 new buses for the J Line and service frequency was increased such that buses were able to run every 4–6 minutes at peak commute hours. Additionally, net-toll revenue funds applied toward incremental transit service has allowed for increased service on Foothill Transit (Silver Streak and Line 699), Torrance Transit (Line 4x), Gardena G Trans (Line 2), and Metro's J (Silver Line) (Metro, 2025).

Economic Value

As of 2025, the existing ExpressLanes have facilitated over 340 million trips and issued more than 1.6 million transponders (Metro, 2025a). ExpressLanes have saved riders an average of 12.7 to 13.7 minutes per trip during peak times as compared to GP lanes (Metro, 2025).

Costs

The initial pilot's capital costs totaled $210 million, to convert existing HOV lanes and add tolling infrastructure (Linton, 2014). Ongoing operations and maintenance, including the toll account payment system, are funded through toll revenues.

Revenue

California state law (California Streets and Highways Code 149) stipulates that all remaining revenue generated by a toll facility after direct expenses, operations, maintenance, enforcement, and reserves, must be used in the corridor from which the revenue was generated. In October 2013, the Metro Board adopted guidelines governing reinvestment of approximately $26.7 million in net toll revenue funds to projects with a direct mobility benefit to the ExpressLanes corridors. The overall program is comprised of two elements: a set-aside component and a competitive grant. The set-aside is comprised of funds provided to continue the operation of transit services that address social equity and encourage increased transit ridership as well as a reserve fund. The competitive grant provides funding to implement multi-modal mobility options including freeway/roadway improvements, transit enhancements and active transportation and system connectivity. In October 2015, Metro's Board adopted revised guidelines to establish a new set aside to allocate funds to Caltrans for freeway improvements that benefit the ExpressLanes.

As of 2022, ExpressLane revenues have funded nearly 60 clean-fuel buses and the addition of more than 100 vanpools along the ExpressLanes corridors. As of 2025, over $186 million in toll revenues have been invested in improved transit service and mobility improvement projects along the I-10 and I-110 corridors (Metro, 2025a).

Engagement

Notably, the ExpressLanes program began as 12-month pilot, funded by federal dollars, and was publicly messaged as such. Metro produced videos and websites explaining how drivers could take advantage of the new toll lanes. FHWA published an early results memo in April 2014 to help inform Metro on determining whether tolled operations should continue beyond the pilot. The memo stated that results suggested that "many of the strategies deployed are accomplishing their goals and objectives" (FHWA, 2014). The success of the pilot enabled the Metro Board to unanimously vote to make the pilot permanent. Public messaging from Metro was around providing the solo driver a "choice" to pay for reliability and a guaranteed trip or choose to continue driving in the GP lanes.

Equity

When the ExpressLanes debuted in 2012, Metro implemented an associated Low-Income Assistance Plan. This program is still in place and allows qualifying LA County residents to receive a one-time $25 credit at account set-up, which can be applied to either the transponder deposit or pre-paid toll deposit. The $1 monthly account maintenance fee is also waived for these users. As of the 10th anniversary of the ExpressLanes in November 2022, according to the most recently available data, nearly 24,000 low-income accounts had been opened (Jager, 2022).

In 2019, Metro initiated a Pay-As-You-Go model to enable drivers to use the ExpressLanes without a transponder or registered account. Drivers without an account or transponder are charged the toll and a $4 processing fee per transaction/one-way trip with a payment notice sent to the registered owner of the vehicle. Additionally, Metro's Transit Rewards program offers transit riders who register a TAP card on their ExpressLanes account the opportunity to earn a $5 toll credit each time they take 16 one-way transit trips during peak hours on the I-110 Harbor Transitway or the I-10 El Monte busway. Transit rewards toll credits issued to date total $253,370.

Political Considerations

When first proposed, congestion pricing and tolling generated considerable debate; critics sometimes labeled the concept as inequitable "Lexus Lanes" that were only for those who could afford them (ABC7 Los Angeles, 2014). However, high usage, positive performance outcomes, effective messaging, and strong board support propelled the transition from pilot to full program.

When advancing its ExpressLanes Strategic Plan in 2015, Metro decided to consider only freeways with existing, under construction, or planned HOV lanes for conversion to ExpressLanes (Metro, 2015). This policy does not appear to have changed since that time. While it is legal under state and federal law to convert existing GP lanes to HOV lanes and then later to convert them to HOT or priced lanes, Metro has—as yet—declined to pursue this strategy. Discussions with Metro staff indicated that this hesitancy is largely political in nature, with staff not wanting to get crosswise with their Board or other elected officials.

Project Successes, Challenges, and Key Lessons Learned

Over more than a decade of operation, Metro's ExpressLanes program has demonstrated that congestion pricing can function effectively in one of the most congested metropolitan regions in the United States. High and growing usage levels over time further suggest broad acceptance and indicate that travelers value reliability enough to adjust their behavior, whether by paying a toll, carpooling, or shifting to transit services that benefit from ExpressLanes operations.

However, as ExpressLanes have become more popular, rising demand has at times strained the system's ability to maintain optimal free-flow speeds, particularly during peak periods. This has required continual refinement of pricing algorithms, occupancy policies (such as HOV eligibility thresholds and Clean Air Vehicle exemptions), and performance thresholds, and Metro has continued to increase its maximum ExpressLanes toll rates (Metro, 2025c). Significantly, Metro's policy has consistently maintained a per-mile cap rate with Board-approved ceilings that have been raised periodically to maintain performance standards.

Moreover, Metro has been unable to expand the ExpressLanes network as desired in the ExpressLanes Strategic Plan, the Vision 2028 Strategic Plan, and Measure M. While Metro has not formally addressed this challenge, discussions with Metro staff indicate that it is likely related to Metro's commitment to providing ExpressLanes with two lanes in both directions, which often means expanding freeway capacity and brings substantial additional challenges. Another factor is Metro's reluctance to convert GP lanes to tolled lanes.

Enforcement has also remained a persistent operational challenge, as ensuring accurate vehicle occupancy declarations and compliance is essential to maintaining both fairness and performance. Metro's low-income assistance program has expanded access and improved public perceptions (particularly concerns that ExpressLanes favor higher-income drivers), but this has required high-effort sustained outreach, transparency, and program adjustments.

3.3 Southern California: Los Angeles Metro Traffic Reduction Study

Summary

Metro's Traffic Reduction Study (TRS) is intended to determine the feasibility of implementing congestion pricing and complimentary strategies to alleviate traffic congestion in LA County and reinvesting revenues into high-quality transportation options. Identified as an initiative in Metro's 2018 Vision 2028 Strategic Plan and formally approved in 2019, the study has completed three phases of modeling and analyzed 14 potential congestion pricing concepts (Metro, 2018).

After pausing the study in 2022 due to COVID and transitions in Metro executive leadership, the modeling resumed. In October 2025, staff presented recent modeling which demonstrated that the strongest-performing pricing solution to congestion was a combined downtown Los Angeles (DTLA) cordon zone and a West LA/Santa Monica cordon zone (see **Figure 3**). This configuration closely matched the cordon boundaries analyzed in the 2019 SCAG Go Zone study (Metro, 2025d) described above.

Figure 3. Map of TRS Concept Areas October 2025

Both the DTLA and West LA/Santa Monica zones also performed well on their own. The model assumed 50% pricing reductions for high-occupancy vehicles (HOV) with three or more passengers and assumed mobility wallets[1] would be distributed to low-income households who commute into priced areas (rather than full exemptions for these two groups as was assumed in the second round of modeling). The use of mobility wallets in model assumptions drove the most significant improvements in traffic reduction between the second and third rounds of modeling.

[1] What is a Mobility Wallet? A mobility wallet is a transportation budget that recipients can use to pay for a variety of transportation options, including transit, taxis, congestion pricing tolls, microtransit, or other transportation options. It allows recipients to decide how to spend their allocated transportation budget in a way that works best for their needs and lifestyle.

Assuming the use of mobility wallets was a key shift for the TRS because it retains the incentive effect of pricing even for low-income households receiving subsidies. Mobility wallets allow this group to choose if they want to use their mobility wallet funds to pay for tolls or other modes. This methodology allows Metro to address key equity considerations of pricing while also supporting its goal to reduce congestion during peak travel times.

Key evaluation criteria for each alternative analyzed included reductions in traffic congestion and delay, availability of alternative modes of transportation in the cordon zone, public perception (based on Phase 2 outreach), and environmental and economic justice for disadvantaged communities.

Project Origin and Objectives

Metro approved a Congestion Pricing Feasibility Study (later branded the TRS to emphasize outcomes) as a core Transformational Initiative to the Board's "Re-imagining of LA County" (Metro, 2019 and 2021). Pricing, if implemented after TRS study completion, was also included as a potential funding mechanism to accelerate Twenty-eight by '28, a City of LA and Metro initiative to complete 28 transportation infrastructure projects before the 2028 Olympic and Paralympic Games in Los Angeles (Metro, 2019a) (Schank, Huang, and Westervelt, 2026).

In an unusual move for Metro, staff included the TRS scope of work in a board report prior to issuing the RFP. This was intended to encourage Board understanding and acceptance of the TRS, stimulate private sector interest in the project, and foster public transparency and trust around the TRS study goals.

The primary objective of the TRS is to identify locations for one or more LA County pricing pilots that have the greatest potential to reduce congestion. Other pilot objectives include (Metro, 2025):

- Enhance economic opportunities by improving access to jobs and other destinations, particularly for low-income and vulnerable communities
- Reduce air and climate pollution, especially in areas near freeways and major roads
- Improve roadway and transit safety
- Invest pilot net revenues into communities and populations that could be negatively affected by the program

Traffic Congestion: VMT and Hours of Delay

Third-round modeling results indicate a 1% reduction in daily countywide VMT and 16.8% reduction in daily VMT within the modeled traffic reduction zones in DTLA and on the west side.

The model also indicated a 4% reduction in countywide delay (66,100 hours per day), and a 41.6% reduction in delay (9,459 hours per day) within the modeled traffic reduction zones (Metro, 2025).

Mode Choice Shift: Mode and Vehicle Occupancy

Third-round modeling indicates countywide increases in transit and active transportation modes, including bus (2.5%); rail, commuter rail, BRT (20.9%); and active transportation (6.2%). It indicated a reduction in single-occupancy vehicle trips of 1.1%, and a small reduction in countywide HOV trips of 0.5% (Metro, 2025).

Costs

Publicly available TRS documentation focuses on modeling outcomes rather than detailed cost accounting but emphasizes that implementation would require deeper operational planning, cost estimates, and funding analysis.

Revenue

Metro estimates that Implementing the West LA/Santa Monica and Downtown LA traffic reduction zones will generate a combined $616 million in net revenue per year.

Engagement

Metro recognized the need to "extensively, comprehensively, and genuinely" engage stakeholders and the public in the study process to help develop widespread support for a pilot program. Metro's RFP for consultant support services included gauging public opinion, conducting stakeholder and public engagement and public education and engagement, developing an equity strategy, and winning support for a pilot program through digital and social media engagement, traditional media campaigns, community events, focus groups and workshops, strategic partnerships with CBOS and change agents, and designing a roadmap for continued engagement during implementation of any pilot program. To date, however, these strategies may not have been deployed.

Equity

Metro engaged a diverse audience to inform the development of its model. They conducted surveys, focus groups, ethnographic research, and partnered with community-based organizations to ensure the study incorporated lived experiences. Over 1,500 individuals provided feedback as part of this effort.

Through this outreach, research, and advancing understandings of how mobility wallets work (primarily gained through Metro's ongoing mobility wallet pilot program), the third-round model evaluated the use of mobility wallets to address equity considerations alongside TRS study decongestion goals. The project assumes that more than 100,000 mobility wallets will be distributed to low-income residents. The pilot in the West LA/Santa Monica and DTLA zones would increase the number of jobs accessible within 60 minutes by transit countywide by 8.9%, and 14.8% for Metro's Equity Focus Communities (EFCs). The modeling assumed a more modest increase in job access countywide for trips by car (3.3% anticipated), and 3.63% in EFCs.

As the project progresses toward detailed operational planning, staff have identified the need to address "hotspots in Equity Focus Communities that show reduced speed on some small road segments" near the planned locations.

Political Considerations

In February 2022, Metro indicated that it would be taking additional time to understand the impact of the COVID-19 pandemic on mobility patterns and other data used to inform the TRS, in part due to political pressures and turnover in Metro leadership (Metro, 2022).

Conflicting public opinion about potential pricing programs is not unprecedented. After the second round of modeling, Metro solicited public comments which revealed concerns regarding the post-COVID economy but also showed support for the pilot in DTLA due to the many converging transit options that already serve and pass through the area.

After Metro's third round of modeling, it confirmed that the results showed that congestion pricing fulfills the goals of the study.

Project Successes, Challenges, and Key Lessons Learned

While Metro's TRS study is not yet complete (as of June 2026), the study has demonstrated that equity-centered congestion pricing in Los Angeles County could meaningfully reduce traffic congestion while increasing transit use and improving access to jobs. Integrating equity directly into its modeling framework through mobility wallets allows Metro to test affordability strategies without compromising on congestion reduction outcomes.

The study also highlighted key challenges associated with public skepticism and uncertainty around localized traffic impacts which still need to be understood and addressed. This underscores the need to continue public outreach and mitigation planning efforts.

3.4 Southern California: SANDAG Road User Charge

Summary

As part of their Regional Transportation Plan (RTP), the San Diego Association of Governments (SANDAG) included a Road User Charge (RUC), to raise revenue for infrastructure projects and to discourage driving to assist the region in meeting state-mandated climate goals. The RTP is a federal and state mandated planning document prepared by Metropolitan Planning Organizations and approved by their board. However, in September of 2022, the SANDAG board voted to eliminate the RUC from the plan.

SANDAG had initially included the RUC for several reasons. It would generate revenue in a more equitable way than a sales tax. It was also potentially the best method for supporting GHG and VMT goals. As the RTP

included several big projects, including new rail lines that would require more and different revenue sources, the RUC was a potential source of funding for those new lines.

Although the SANDAG RUC was a flat per-mile fee rather than a variable congestion price, it emerged from a deliberate regional planning process that evaluated multiple revenue and demand-management mechanisms and selected the RUC as the instrument best aligned with state-mandated VMT and GHG reduction goals. Therefore, it is still instructive in a congestion pricing context.

Project Origin and Objectives

As the regional MPO, SANDAG is responsible for preparing an updated a federal and state mandated Regional Transportation Plan (RTP) every four years, which describes existing and projected transportation needs, conditions, and financing affecting all modes of transportation over a planning period of at least 20 years. The financial plan required by the RTP outlines estimated revenues and expenses for projects, programs, and policies that the plan proposes.

In October 2019, SANDAG requested an extension for the RTP, citing concerns that it would not be able to meet state-mandated 19% greenhouse gas reduction target by 2035 in the upcoming regional plan update. SANDAG was also recovering from a financial crisis over inaccurate revenue projections from the TransNet sales tax, had recently changed the governing structure of the agency, and had hired a new executive director. The state granted a two-year extension and SANDAG leadership instructed staff to come back with something innovative and different.

As SANDAG worked to develop the plan, it included the RUC as a mechanism to raise revenue for infrastructure projects and to discourage driving for the region to meet state-mandated climate goals. However, by September of 2022, the SANDAG board voted eliminate the RTP. The prior 2021 RTP had included an RUC and proposed partnering “with state agencies and other metropolitan planning organizations to design a comprehensive road usage charge pilot, assess equity impacts, and test mitigation strategies” (SANDAG, 2021).

SANDAG had included the RUC for multiple reasons: it was a user-based fee, considered more equitable than a sales tax, seen as the best method for supporting GHG and VMT goals, and could raise significant revenue. At the time, the RTP included several new rail lines that would require more and different revenue sources. Importantly, cordon pricing was not considered because the San Diego region is decentralized and has multiple centers of activity. While downtown San Diego is the largest center of activity, with 100,000 jobs (SANDAG, 2019), that only represented five% of regional employment.

Metrics and Performance

In early drafts of the RTP, prior to it being amended, SANDAG planned to implement the RUC beginning in 2030 and assumed a fee of 3.3 cents ($2020) per mile traveled, declining to 2.8 cents by 2050. The RTP estimated the fee would bring in $14.2 billion ($2020) in total revenue over the 2030-2050 period (SANDAG, 2021a).

Engagement

Under the condensed time frame to complete the RTP, SANDAG staff remarked that they could not conduct sufficient outreach and engagement more typical of their four-year process. Many noted that the Board was not fully brought along during the process of considering the RUC. This is one of the reasons given for the proposed project's failure.

Political Considerations

At the time of the discussions around the RUC, SANDAG had recently made governance changes in which the voting power on the board would be proportional to the population of the communities the board members represented. In other words, a vote from a board member from the City of San Diego would be weighted more than from a smaller city. This process created new dynamics that contributed to discontentment and disagreement among board members. More critically, the RTP was also being considered for adoption ahead of a local election cycle. Board members were concerned that if they supported the RTP with the RUC, they would not be re-elected. They also worried the RUC could undermine public support for future transportation sales tax measures.

Project Successes, Challenges, and Key Lessons Learned

The failure of the RUC in San Diego has resulted in a bit of a retrenchment for big projects in the region. The 2025 RTP is much smaller in scope and less ambitious than the previous plan (2021) which had included road user charges. In the current plan, SANDAG pivoted to improving systems that already exist (SANDAG, 2025). Some of the downsizing was driven by updated project cost projections as well as slower population growth forecasts. In the plan, SANDAG also introduced the concepts of "Complete Corridors," a network of managed lanes that entail HOV conversions, some new Express Lanes and some GP lane conversion (slated for after 2035). The 2025 RTP includes 93 miles of new managed lanes and 259 miles of managed lanes conversions from existing HOV or GP lanes. Currently, SANDAG is pursuing a phased approach to improving the I-5 and I-805 freeways by first adding new HOV lanes and then converting them to HOT. In response to some of the political confusion over the RUC, SANDAG staff has also shifted its approach to Board engagement and is spending time educating board members on the fundamentals of pricing and express lanes through workshops and retreats.

3.5 Bay Area: SFCTA Downtown Congestion Pricing Study

Summary

In July 2019, the San Francisco County Transportation Authority (SFCTA) initiated a study on congestion pricing in downtown San Francisco. The study included public engagement to understand perceptions around congestion pricing and a list of potential program features. Final recommendations were never made public due to "changing and fluid conditions surrounding traffic conditions and transit use" during the COVID-19 pandemic. An interim update on the study was provided in 2020, but as of January 2026, the study has not been resumed (SFCTA, 2020b).

Two potential areas were investigated for congestion pricing (See **Figure 4**). A small zone that included the SoMa, Tenderloin, Mid-Market, Nob Hill, and Chinatown neighborhoods and a larger zone that included this area along with Mission Bay and northeast neighborhoods. SFCTA envisioned that the zone would be priced during weekday rush hours, from 6a.m. – 9a.m. and 3:30p.m. – 6:30p.m. Before the study was paused, SFCTA had put forth three recommended scenarios for detailed analysis, with prices ranging from free (for very low-income drivers) to up to $14 (for middle and high-income drivers), with discounted rates for those in low- and moderate-income groups, as well as drivers with disabilities. The fees were determined by what would be needed to achieve the study's 15% vehicle trip reduction goal.

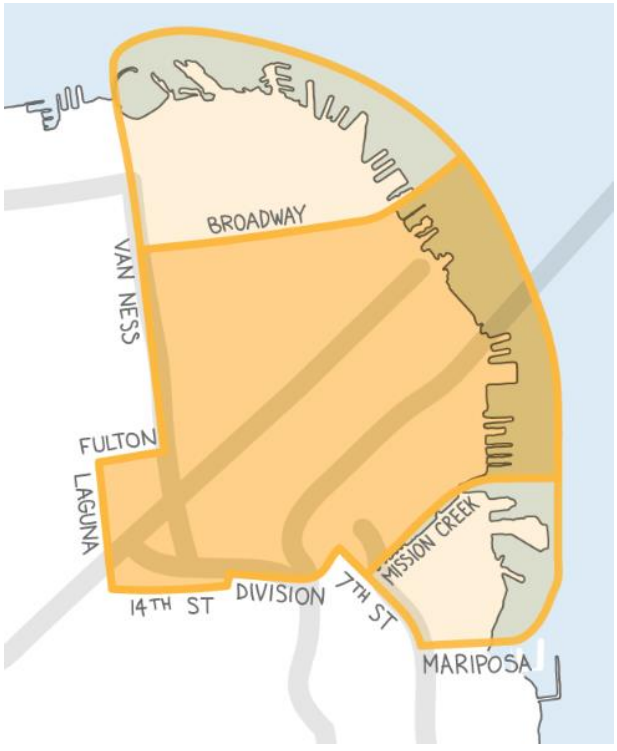

Figure 4. Potential Downtown San Francisco Congestion Pricing Zones

Two-trip caps were envisioned for vehicles driving into the zone multiple times per day, though ride-hail vehicles would be subject to the fee each time they entered in the zone. The study also considered discounts for residents of the zone, bridge toll payer discounts, and expanded Muni transit discounts for those in low-income brackets.

The unfinished study developed a list of potential revenue uses, including more bus service, more transit in underserved locations, free Muni transit for very low-income riders, active transportation safety improvements, street repaving, transit ambassadors, school buses, improved paratransit, and programs for a safer, cleaner downtown, though these options were not prioritized.

Project Origin and Objectives

SFCTA began exploring congestion pricing around downtown San Francisco in the early 2000s after the dot com boom and bust. The preliminary goal of the effort was to reduce car trips downtown by 15% during peak periods to improve congestion and encourage transit, walking, and bike travel.

The concept was discussed over the years through various studies and initiatives. SFCTA's 2010 Mobility, Access, and Pricing Study (SFCTA, 2010) suggested that congestion pricing could deliver significant benefits, including 12% fewer peak period auto trips, a 21% reduction in vehicle delay, transit speed improvements of 20–25%, and reductions in GHG emissions and pedestrian collisions. Importantly, it also found that the impacts of pricing on local businesses were neutral. Additionally, other planning efforts including San Francisco's long-range transportation plan, 2019 Vision Zero Action Strategy, and 2021 Climate Action Strategy, and Plan Bay Area 2040, all recommended that San Francisco explore congestion pricing.

In 2019, SFCTA began a new study for a downtown cordon zone with similar boundaries to those considered in the 2010 report. By then, congestion had reached record levels due to a growing population, strong economy, and demand for travel by ride-hail vehicles, particularly in downtown and SoMa. San Francisco had already reduced congestion through parking pricing, adding transit-only lanes, installing protected bike lanes, and taxing ride-hail trips to support other modes. But those actions were not sufficient to reduce the growing demand for personal vehicle trips. Importantly, downtown San Francisco already has road pricing in the form of tolls on the Bay Bridge (the East Bay is a source of as much as 40% of downtown trips) and tolls on the Golden Gate Bridge (which carries a much smaller share of trips to downtown at less than 10%).

Additionally, many other planning efforts including San Francisco's long-range transportation plan, SF's 2019 Vision Zero Action Strategy, and SF's 2021 Climate Action Strategy, Plan Bay Area 2040, and more, all recommended that San Francisco explore congestion pricing.

Study materials from the 2019 timeframe state that congestion pricing is a tool to shift personal vehicle demand to other modes or less busy times, and to make transportation in the City and County more equitable (SFCTA, 2020a). Additionally, the preliminary goal of the effort was to reduce car trips downtown by 15% during peak periods to reduce congestion and help transit, walking, and bike improvements work.

In the 2019 study, SFCTA defined the following goals for a future congestion pricing program:

- Get traffic moving so people and goods get where they need to go
- Increase safety for people walking, biking, and driving
- Clean the air to support public health and fight climate change
- Advance equity by improving health and transportation for historically underinvested communities (SFCTA, 2020d)

Mode Choice Shift: Mode and Vehicle Occupancy

To accommodate the expected increases in transit ridership, a 20–25% increase in transit service would be necessary. The study concluded program revenue from the congestion pricing would be sufficient to fund this.

Revenue

The study also projected that revenue available for other investments, after accounting for system costs and the transit service increase, would range from $6 million to $60 million annually, depending on the scenario chosen. Purely income-based pricing generates more revenue than options that include discounts for residents and bridge toll payers. And a smaller zone generates less revenue than a larger zone.

Engagement

SFCTA convened a Policy Advisory Committee made up of neighborhood, business, advocacy, and community representatives. Other planned outreach tools included co-creation workshops, multi-lingual town halls, community presentations, round tables with business and labor groups, online and text surveys, digital outreach, earned media, multi-lingual advertisements, postering in key corridors and parking garages, and sharing with SFCTA networks.

Equity

Equity was a stated consideration in the 2019 study, and SFCTA studied a suite of global examples for their impacts on health, affordability, and revenue generation. Cities studied included Stockholm, Seattle, New York, London, Trondheim, London, and Singapore. A 2011 San Francisco Department of Public Health study on the health effects of road pricing concluded that a congestion pricing program in San Francisco would result in 45 fewer vehicle-pedestrian collisions over a 10-year period, and improvements in air quality would prevent three air-pollution related deaths (SFDPH, 2011).

SFCTA decided to offer discounts and exemptions to some local and low-income drivers and that revenues generated from the program should be invested in disadvantaged communities and on improvements to transit, active transportation, and supportive infrastructure, though the exact uses were not finalized (SFCTA, 2020c).

Political Considerations

Congestion pricing in downtown San Francisco has long had mixed public support. A 2019 poll by the Chamber of Commerce reflected only 30% support and 65% opposition (Fitzgerald Rodriguez 2019). In 2021, local politicians were divided, with then-County Supervisor Aaron Peskin disapproving of SFCTA's apparent pro-pricing bias. However, other elected officials, such as then-Mayor London Breed voiced strong support (Matier, 2020).

In March 2025, a group of San Francisco Supervisors traveled to New York to understand its congestion pricing program, and were impressed by the success of their initiative, though not sold on its political viability in San Francisco. However, Supervisor Matt Dorsey felt that minds could be changed (Fitzgerald Rodriguez, 2025).

Project Successes, Challenges, and Key Lessons Learned

Although SFCTA's 2019 Downtown Congestion Pricing Study did produce final recommendations or implementation strategies, it made meaningful contributions to the development of congestion pricing policy in San Francisco and recent developments in 2025 indicate continued political interest in the concept. The study updated analytical work conducted in 2010 to reflect evolving travel behavior, the growing role of ride-hail, and a stronger emphasis on equity. SFCTA advanced a technically credible program concept, including clearly defined pricing zones, peak-period charges, income-based discounts, and thoughtful consideration of exemptions and trip caps. Equity was embedded early in the analysis, with proposed pricing structures and revenue uses designed to improve transit access, safety, and public health, particularly for historically underinvested communities.

The primary challenge facing the study was its timing. SFCTA continued working on the study until at least 2021. The COVID-19 pandemic fundamentally disrupted downtown travel patterns and transit ridership just as the effort was approaching completion, calling into question key assumptions and ultimately pausing progress.

3.6 Bay Area: San Mateo Express Lanes

Summary

The San Mateo 101 Express Lanes Program consists of 22-miles of express lanes in both directions on U.S. 101 from the San Mateo County/Santa Clara County Line to I-380 in South San Francisco (See **Figure 5**). The project was a multi-agency effort led by Caltrans, the San Mateo County Transportation Authority (SMCTA), and the City/County Association of Governments of San Mateo County (C/CAG), and the Metropolitan Transportation Commission (MTC), the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. Operations were overseen by the San Mateo County Express Lanes Joint Powers Authority (SMCEL-JPA). Uniquely, the project benefited from $53 million in private contributions from private sector employers like Google and Facebook to see the project to completion.

Figure 5. Map of San Mateo 101 Express Lanes

The project was implemented in two phases. Phase one opened in February 2022 and converted seven miles of existing HOV lanes to HOT lanes between the Santa Clara/San Mateo County line to Whipple Avenue. Phase two opened in March 2023 and added 15 miles of new lanes from Whipple Ave to I-380 (Caltrans, 2023). The existing footprint of the highway remained largely the same, with the new lane created through re-striping auxiliary lanes.

The US 101 Express Lanes are priced based on real-time traffic levels, with higher prices during peak travel hours and lower during less busy times. Single-occupancy vehicles must pay the full posted toll price, while two-person carpools pay a discounted 50% toll, and carpools of three or more, motorcycles, and buses and vanpools may travel for free. Low-income households (below 60% of the San Mateo County Area Median Income) may apply to the San Mateo County Go Card program, which provides $200 prepaid cards that can be used for qualifying transportation purchases, including paying tolls. The Express Lanes are only operational between 5 a.m. and 8 p.m. on weekdays and are open to all vehicles outside of those hours.

Project Origin and Objectives

In the early and mid-2010s, congestion on US 101 through San Mateo County and Santa Clara County was consistently ranked among the highest in the region, due to US 101's role as the primary commute corridor between the Bay Area and Silicon Valley. Powerful technology companies like Facebook and Google pressured the governor and state to act.

Express lanes were advanced as the solution because there were existing transit alternatives, Caltrain was moving forward with electrifying its rail lines, and the tech industry's private employee shuttles going to and

from Silicon Valley would benefit. Express lanes could provide a significant economic benefit, could allow for 3+ person carpooling, and still continue to provide a choice to drivers to use GP lanes.

Key objectives of the project include:

- Reduce congestion in the corridor
- Increase person throughput (the number of people moved)
- Encourage carpooling and transit use
- Improve travel time and reliability for Express Lane users
- Use modern technology to manage traffic
- Upgrade pavement and lane striping (Caltrans, 2023)

Traffic Congestion: VHT

In the first quarter of FY 2026 (the most recent publicly available quarterly dataset), express lanes maintained average speeds of 10–11 mph faster than GP lanes during tolling hours, indicating the priced lanes are maintaining higher throughput and reduced congestion relative to the unpriced lanes. The express lanes have also experienced a sustained increase in the number of average daily trips, suggesting continued demand for priced lane travel (SMCEL-JPA, 2025).

Mode Choice Shift: Mode and Vehicle Occupancy

During the first quarter of FY2026, HOV3+ trips rose 3.9% compared to the same quarter of the prior fiscal year, with trip violations decreasing 1.5%, indicating an actual increase in the number of carpools using the lanes. Express lane trips made up 46.7% of total trips in the corridor during this period (SMCEL-JPA, 2025).

Costs

Capital costs for the San Mateo 101 Express Lanes were approximately $581 million, covering environmental work, design, right-of-way, lane construction and tolling infrastructure. Funding sources included local Measure A funds ($30.5M), private contributions ($53M), federal funds ($9.5M), state allocations (nearly $307M), regional funds ($95M), and future toll revenue pledged toward loan funding ($86.5 M) (SMCEL-JPA, n.d.). Operations and maintenance costs amounted to $2.1M in the first quarter of FY 2026 with approximately $100K in debt payment disbursements (SMCEL-JPA, 2025).

Revenue

Quarterly revenue from tolling has fluctuated from $6.4M (Q1 of FY 2026) to $8.3M (Q4 of FY 2025), with additional revenues from toll violations, fees, and penalties. Net revenues have been positive in all quarters during which the lanes have been operational. Lanes revenues help fund the Go Card Program (SMCEL-JPA, 2025a).

Equity

A board-driven priority, the Go Card program provides low-income households below 60% of the San Mateo County Area Median Income with $200 prepaid cards that can be used for qualifying transportation purchases, including public transit, express lanes, toll bridges, paratransit, and bike or scooter rentals throughout much of the Bay Area. Participants must re-apply annually to receive additional funds and verify they still meet the income requirements (SMCEL-JPA, n.d.a).

The Go Card Program was the result of extensive study and outreach, which culminated in recommendations in the San Mateo US 101 Express Lanes Equity Study (SMCTA, 2021). Completed in 2021 and unanimously approved by the SMCEL-JPA, the study recommended an equity program that would be flexible, adaptive, and responsive to evolving community needs.

The Go Card program replaced the earlier Community Transportation Benefits Program, which provided participants with either a preloaded $100 Clipper card or preloaded $100 FasTrak toll transponder. This program experienced low uptake, due in part to limited registration locations, low benefit value, and limited outreach and engagement, which the Go Card program aimed to solve by implementing online registration, an increased combined benefit of $200, and more robust outreach (SMCEL-JPA, 2024).

Engagement

Internal Engagement

Caltrans hired a director whose role was to coordinate the program across Caltrans, SMCTA, C/CAG, MTC, the Valley Transportation Authority (VTA), the congestion management for Santa Clara County, as well as private sector industry leaders. These dynamics were difficult, given that each agency had differing roles and each prioritized their own role. For example, the SMCTA controlled the local sales tax measure, while C/CAG was technically responsible for congestion management.

As they worked to complete a Project Study/Report, the role of each agency was clarified. Caltrans was responsible for leading the environmental documentation, but the technical work was done by consultants that worked for the TA. An integrated project delivery team was created, in which the Project Manager was from Caltrans and the Deputy Project Manager was from the TA. An Executive Management Committee was created, with representatives from MTC, C/CAG, SMCTA, VTA, Caltrans, Google and Facebook. The committee's responsibility was to steer the project through the environmental and construction phases.

External Engagement

To address criticisms of the Express Lanes being "Lexus Lanes," the Board directed, the TA to engage advocacy groups and develop a mobility action plan to identify a suite of mobility improvements that would focus on equity. The Community Transportation Benefits Program came out of this.

Political Considerations

According to project leaders, one of the hardest issues to manage was determining which agency would own and operate the Express Lanes, since that determines who has control over revenues. At the time of these discussions, the Executive Steering Committee had dissolved, having completed its task to guide the environmental process and get the project built. As a result, these conversations played out at elected official levels at MTC, C/CAG, and the SMCTA.

San Mateo County agencies were opposed to MTC having authority over the project, even though MTC held similar responsibilities for other congestion management programs. The SMCTA wanted to retain local control because it had loaned significant funds toward project construction. To resolve the issue, a Joint Powers Authority, the San Mateo County Express Lanes JPA (SMCEL JPA), was created, comprised of the SMCTA and C/CAG; MTC was not included as a member. SMCEL JPA pays the SMCTA to provide certain services and also contracts with the Bay Area Infrastructure Financing Authority (BAIFA) to operate the lanes. BAIFA is a joint powers authority formed by a partnership between the Metropolitan Transportation Commission (MTC) and the Bay Area Toll Authority (BATA) to manage, finance, plan, and operate express lanes.

As SMCEL JPA looks to expand Express Lanes north to the San Francisco County border, there is more organized opposition than what was originally experienced with Phases 1 and 2. Staff attribute this to greater public awareness of the issue of "induced demand." Induced demand is the concept that adding new highway capacity tends to attract additional driving over time, thus offsetting congestion relief the new capacity was meant to provide. The result is actually an increase in VMT and GHG emissions as a result. The induced demand concern applies to adding new lane-miles specifically. As a result, the advocacy groups have not raised concerns about converting existing general-purpose lanes to HOV, since that conversion reallocates existing capacity rather than adding new capacity.

Project Successes, Challenges, and Key Lessons Learned

Since opening in 2022 and 2023, the San Mateo 101 Express Lanes have consistently delivered faster travel times than adjacent GP lanes, maintaining average speeds approximately 10–11 mph higher during tolling hours than previously. Demand for the facility has increased, with sustained growth in daily express lane trips. The project has also shown progress toward its person-throughput goals, with HOV3+ trips increasing year over year and violations declining. Strong governance and multi-agency collaboration, formalized through the SMCEL JPA, was essential to delivering a complex, multi-phase project across jurisdictions; however, the JPA did add an additional agency to an already complicated regional governance structure. The Express Lanes have demonstrated that dynamic pricing paired with clear carpool incentives can meaningfully influence travel behavior, as evidenced by rising HOV3+ usage and declining violations. Lastly, the transition from the initial benefits program to the more flexible Go Card model demonstrates the value of piloting, evaluating, and refining equity strategies over time.

3.7 Bay Area: I-880 Express Lanes Alameda

Summary

The I-880 Express Lanes, opened in October 2020 as a conversion of existing HOV lanes, are located in Alameda County on 22 miles of northbound lanes between Dixon Landing Road and Lewelling Boulevard and 27 miles of southbound lanes between Hegenberger Road and Dixon Landing Road (See **Figure 6**).

Figure 6. Map of I-880 Express Lanes

These lanes are priced based on real-time traffic levels, with prices higher during peak travel hours and lower during less busy times. Single occupancy vehicles must pay the full posted toll price, while two-person carpools pay a discounted 50% toll, and carpools of three or more, motorcycles, and buses and vanpools may travel for free. Low-income households may apply to receive discounted tolls. The Express Lanes are only operational between 5 a.m. and 8 p.m. on weekdays, and are open to all vehicles outside of those hours.

The lanes utilize California's FasTrak Flex system. Drivers must set an onboard switch to match the number of people in the vehicle. Drivers with standard toll tags but without the switch will always be charged the full toll. The planning, development, delivery, operations, and life-cycle replacement of I-880 Express Lanes are managed by the Metropolitan Transportation Commission (MTC) through the BAIFA, and are branded as part of the Bay Area Express Lanes network. BAIFA is a joint powers authority between MTC and the Bay Area Toll Authority (BATA). BAIFA shares the same governing board as MTC and BATA. Caltrans is also heavily involved.

Project Origin and Objectives

Since the early 2000s, as HOT lanes became more popular nationwide, the Bay Area began to conceive of a regional network of dedicated lanes that primarily serve carpools and buses but makes use of underutilized and available capacity to move more people by converting HOV lanes to HOT lanes. The Bay Area already had an existing but disconnected HOV network with key gaps. The creation of HOT lanes then became a source of funding to close these gaps and establish a single regional network of express lanes. Early on, MTC staff motivations for advancing a network of Express Lanes were to better utilize system capacity, improve reliability, reduce congestion, and introduce the notion of market pricing as a step towards future full congestion pricing. The revenue generation would help close expensive gaps in the HOV/HOT system. MTC was also hopeful that an express bus network could utilize the system.

I-880 was viewed as an important part of the larger network in that it had segments that could be quickly and easily converted to HOT lanes. However, since the COVID-19 pandemic and changed travel patterns, the outlook has changed and there is no longer the demand for an express bus network. Additionally, public appetite about adding lanes or highway widening to close some of the gaps has dropped. There has also been a shift in state funding and requirements, including expensive VMT mitigation requirements for expansions. Initial financial projections that suggested Express Lanes would generate enough money to fill network gaps quickly are now outdated. Additionally, Express Lanes do not help with state-manned GHG targets as they often increase VMT and thus GHG.

Traffic Congestion: VHT

In the second quarter of 2025, express lanes maintained average peak periods speeds 14 mph faster than GP lanes, implying smoother flow and reduced delay for lane users. This performance suggests that express lanes help lower travel times for those who use them, although comprehensive corridor-wide VHT estimates across all vehicles aren't routinely reported.

Mode Choice Shift: Mode and Vehicle Occupancy

Measured shifts toward higher-occupancy travel have been modest but positive: the share of toll-free HOV3+ vehicles has remained substantial (around 44–46%% in recent quarters), indicating strong carpool usage. The share of HOV2 and other occupancy categories has been relatively stable. This data suggests that while Express Lanes have supported carpooling by preserving free access for high-occupancy vehicles, they have not resulted in dramatic mode share changes (Bay Area Express Lanes, 2025). Transit service has been greatly reduced since the pandemic, and there was not a lot of express bus service to begin with on this corridor.

Costs

Capital costs for the I-880 Express Lanes were associated with the conversion of existing HOV lanes to tolled express lanes and installing dynamic tolling infrastructure; the initial investment was approximately $210 million, including lane conversions and tolling systems. Ongoing costs include operations and maintenance of

tolling systems, enforcement, and related administrative expenses, which are supported by toll revenues and associated accounts.

Revenue

In 2024, $50 million in toll revenues were generated by the I-880 Express Lanes. Revenues are being used to fund enhanced enforcement of express lanes and pay off loans that were issued to build the express lanes (Gutierrez, 2024). As of Q2 of 2025, the average toll paid was $8.41, with peak time average tolls of $15.80 for 4pm northbound travel and $12.70 for 7am southbound travel (Bay Area Express Lanes, 2025).

Equity

In April 2023, 3 years after the Express Lanes became operational, MTC initiated Express Lanes START to extend a toll discount of 50% or more to households at or below 200% of the Federal poverty level living in the Bay Area—a requirement identical to the Clipper START program that provides transit discounts to low-income households. While originally launched for 18 months, the pilot has been extended through March 2026 and has increased access for those who joined, though it has not broadly increased I-880 Express Lane access for low-income households. As of June 30, 2025, over 5,500 applications are approved and over 3,700 customers are enrolled, which is positive, but remains a limited share of total Express Lane users (MTC, 2025). MTC has recommended extending the pilot timeframe to March 2029 and has implemented it on I-80 Express Lanes in Solano County (MTC, 2025).

Engagement

As MTC was conducting public engagement ahead of opening the lane, they received concerns about affordability and equity. These concerns continued even after opening the lane, and MTC developed the Express Lanes START program as a direct response to public feedback and concerns from their commissioners. What started as a 3-year pilot was recently extended. MTC is in the process of finalizing an evaluation report, but preliminary findings are inconclusive about its efficacy. Staff report that they are spending more on administering the program than providing a direct benefit, because identifying individuals that are eligible and interested is highly resource-draining.

Political Considerations

Similar to the US 101 Express Lanes Program in San Mateo County, the I-880 Express Lanes program is not immune to competing regional and state interests. MTC's perspective is a network system approach to Express Lanes with consistency of rules and experience is best for customers, and allows for financial resiliency for the network.

However, this perspective can be at odds with existing governance structures, in which county-level agencies do not want to give up local control and have better access to their constituents than MTC. Additionally, Caltrans' permitting authority, but lack of right-of-way ownership further complicates progress, as well as the state's role in setting expensive policies that may not financially pan out.

Project Successes, Challenges, and Key Lessons Learned

The I-880 Express Lanes have delivered clear operational successes that confirm many of the policy objectives behind their design. The corridor has maintained higher average speeds and more reliable travel conditions compared with adjacent GP lanes, helping to reduce delay for users of the express facility, and toll revenue has exceeded early projections, demonstrating strong demand for reliable travel options during peak periods (Gutierrez, 2024). For example, recent reports show increasing toll revenues and usage year-over-year on I-880, with millions of express lane trips and rising average tolls, indicating sustained utilization and financial performance (Bay Area Express Lanes, 2025).

Staff reflected that the HOT lanes have not been as beneficial to transit as initially hoped for. In their analysis, in order for buses to take advantage of the HOT lane, they must get over to it from the right-hand onramp. This only makes sense if the bus intends to stay in the HOT lane for a long enough time. A more premium bus lane would have a different infrastructure model than what MTC is choosing to build. Because of public opposition to freeway widening, MTC is taking a minimal footprint approach by taking the shoulder when available, only utilizing a single lane that has no physical barriers, and having no direct access ramps to the HOT lane.

Additionally, the MTC Express Lanes program revenue forecasts (in which I-880 is one of three corridors in operation) have been lower than anticipated, due to the pandemic. The program has not been able to generate enough net revenue to fund additional transit operations. In fact, MTC's current financial plan has a 10-year outlook with no net revenues from Express Lanes. (While it is possible that one of the corridors has generated net revenue, MTC has the ability and need to apply that money on other corridors, like I-680.)

Ongoing challenges relate to negotiating with the state around financial obligations, and how VMT mitigation requirements hamper MTC's ability to complete the HOT network. Additionally, staff report mixed opinions or unclear direction from the state regarding converting a GP lane to a HOT lane. As of this writing, staff note that there does not seem to be a viable path forward for pricing all lanes on the freeway.

3.8 New York City Congestion Relief Zone Tolling

Summary

New York City's congestion pricing program, known as "Congestion Relief Zone (CRZ) tolling" —represents the United States' first large-scale cordon-pricing system (MTA, 2026). After more than two decades of policy development, advocacy, enabling legislation, and federal review, tolling began on January 5, 2025.

CRZ uses a cordon approach, in which vehicles are tolled for entering the zone defined by streets at or below 60th Street, while excluding FDR Drive, the West Side Highway/Route 9A and certain other segments (See **Figure 7**). Rates vary by time, with peak periods spanning most daytime hours and an overnight rate set as a fraction of the peak price. The Triborough Bridge and Tunnel Authority (TBTA) operates the program.

Figure 7. Map of New York City Congestion Relief Zone

Project Origin

As the Regional Plan Association recounts, the modern era of congestion pricing in New York accelerated after London's launch in 2003, then gained major institutional momentum when Mayor Michael Bloomberg included congestion pricing as one of 127 initiatives within PlaNYC in 2007 (Slevin, 2025). Despite a well-funded advocacy campaign supported by philanthropy, the effort collapsed in Albany in 2008 when State Assembly Speaker Sheldon Silver declined to bring it to a vote. The plan failed amid vocal opposition from outer-borough officials and residents who distrusted the New York Metropolitan Transportation Authority (MTA) and resented perceived favoritism toward Manhattan, and some opine that Bloomberg had not done enough to build a coalition in Albany (Chen, 2025). However, this prompted advocacy efforts around building coalitions and framing policy over the next two decades (Slevin, 2026).

The subsequent Move NY campaign, launched in 2014, attempted to ameliorate concerns from suburban and outer boroughs by reframing congestion pricing to include new tolls in Manhattan and toll reductions in the outer boroughs. Yet, although bills were introduced in Albany, leadership never brought them to a vote (Chen, 2025). In 2015, a "transit crisis" narrative emerged in response to subway breakdowns and delays. Emergency repairs at Penn Station caused major disruptions to suburban commuter rail lines and the subway's service troubles compounded. The Riders Alliance and other coalitions pressured Governor Andrew Cuomo to take responsibility with "Fix the Subway" and "Fix Our Transit" campaigns. NYC Transit President Andy Byford (head of the part of the MTA operates public transportation in New York City), developed a plan to show how congestion pricing money could be used to fix the subway and bus system, and Governor Cuomo endorsed the proposal.

In 2019, Governor Cuomo included a congestion pricing charge in his budget proposal. The 2019 budget bill included other politically sensitive items like elimination of cash bail for minor offenses. The combination of transit rider organizing along with gubernatorial leadership during a period of intense service breakdowns moved congestion pricing forward.

The State Legislature enacted the Traffic Mobility Act (TMA) as part of the state budget. The TMA created a framework for congestion pricing design and implementation, by (Slevin, 2019):

- Authorizing the Central Business District Tolling Program
- Creating the Traffic Mobility Review Board (TMRB) to recommend toll rates and exemptions
- Requiring public performance and financial reporting
- Mandating governance and procurement reforms at the MTA
- Locking revenues into a statutory 80–10–10 allocation (NYC Transit–LIRR–Metro-North)
- Requiring the program to support $15 billion in MTA capital projects.

However, the program needed federal clearance to proceed due to a generalized prohibition on charging tolls on federally funded highways. As a result, New York sought congestion pricing approval under the federal Value Pricing Pilot Program, but the Trump Administration delayed approval and it was not granted until June 2023 under the Biden Administration.

In June 2024, Governor Kathy Hochul paused the program weeks before launch due to electoral pressures. A broad coalition of advocates mobilized the "Unpause the Pause" campaign, and there was a groundswell of support for congestion pricing by advocates and in the media (Wood, 2026). On November 14, 2024, the Governor reinstated the program. After last-minute litigation was resolved, tolling began on January 5, 2025.

On February 19, 2025, the FHWA terminated approval of the pilot. In a letter to Governor Hochul, the USDOT Secretary rescinded the November 2024 agreement signed under the Value Pricing Pilot Program on the basis that the program provides no toll-free option for many drivers and that the toll rate was set to raise revenue for

transit, rather to reduce congestion (USDOT, 2025). The MTA filed a lawsuit challenging the Trump administration's attempt to halt the program, which is currently being heard.

Program Objectives

A key distinction of New York's congestion pricing program from other pricing programs in Europe is that New York's model deliberately made revenue generation a primary objective along with reducing traffic congestion (MTA, 2026). The program has characterized revenues from the CRZ toll as designed to "benefit millions of daily transit riders" through "more accessible stations, modern signal systems, hundreds of new electric buses, and other critical improvements" to keep the system in good working condition and make taking transit more comfortable (MTA, n.d.). While leaders have acknowledged this approach brought added political complexities, a Brookings Institute report concluded that it was successful (Tomer, et al., 2025).

Metrics & Performance

Within its first year, the available evidence suggests the program performed strongly against its core objectives on congestion reduction and revenue generation.

Traffic & Congestion

Between January and October 2025, there were more than 21.5 million fewer entries to the CRZ and excluded roadways, or approximately 11% lower on average than the baseline. This represents an average reduction of approximately 2.2 million vehicles per month than would have occurred without tolling (MTA, 2026).

Compared to 2024, estimated average daily VMT in the CRZ from January through September 2025 was 7.1% lower than same period in 2024. Including the excluded roadways, tunnels, and bridges connecting to the CRZ, estimated average daily VMT declined by 5.8%, year over year, for January through September (MTA, 2026).

Since tolling began, through October 2025, average speeds on crossings entering the CRZ during the weekday morning commute from New Jersey, Brooklyn, and Queens have all improved, by an average of 23% compared to 2024. Improved traffic conditions have also been observed on some major arterial routes beyond the immediate crossing points. Speeds have also increased on roads within the CRZ and on the excluded roadways. Overall, between January and October 2025, average speeds during peak toll hours increased by 4.6% compared to the same period in 2024 (MTA, 2026).

Other Modes and Benefits

Taxi and For-Hire-Vehicle trips increased 1.4% within the CRZ, but vehicle miles traveled decreased 0.4%. Bus speeds in the CRZ increased 2.3% and bus ridership increased 8% on routes serving the CRZ. Subway trips into the CRZ increased 9% (MTA, 2026).

Table 2. Average Daily Ridership and Percent Change on MTA-Operated Service, January through September, 2022 through 2025

Mode	2022 Daily Ridership	2022 % Change	2023 Daily Ridership	2023 % Change	2024 Daily Ridership	2024 % Change	2025 Daily Ridership	2025 % Change
Access-A-Ride	24,479	-	29,769	21.6%	35,653	19.8%	42,307	18.7%
Bus	1,161,852	-	1,192,878	2.7%	1,091,897	-8.5%	1,238,669	13.4%
Long Island Rail Road	139,406	-	173,993	24.8%	202,418	16.3%	222,486	9.9%
Metro-North Railroad	127,301	-	160,139	25.8%	176,831	10.4%	189,763	7.3%
Subway	2,692,621	-	3,120,286	15.9%	3,192,829	2.3%	3,477,379	8.9%

Note: For buses, ridership is derived from OMNY and MetroCard taps and swipes in addition to an estimate of cash fare payments. If a passenger transfers from one bus to another using OMNY taps, their trips would be counted twice for each tap on the bus routes. For commuter rail, LIRR and MNR ridership is estimated by a model looking at all forms of ticket sales within the system. Subway ridership numbers are derived from OMNY and MetroCard taps and swipes in the system and Access-A-Ride ridership is generated from scheduled trips and represents the demand rather than trips completed.
Source: MTA, MTA Daily Ridership and Traffic: Beginning 2020.

According to 311 data from the NYPD, vehicle noise complaints for issues like horn honking decreased in the CRZ by 17% compared to 2024. Crashes declined by 7%, with traffic injuries down 8%. Traffic fatalities were down by 40% as of July, 2025 according to data. Pedestrian fatalities were down 9% (Office of the Governor of New York, 2026).

Air Quality and Emissions

GHGs include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), which are reported together as metric tons of "CO2-equivalent." Compared with 2024, total estimated GHG emissions from vehicles through the third quarter of 2025 were 6.1% lower in the CRZ, 3.4% lower on excluded roadways, and 5.3% lower across the CRZ and excluded roadways combined (MTA, 2026). A Cornell University study found that PM2.5 dropped by 22% in the CRZ, with reductions seen across the five boroughs and surrounding suburbs (Office of the Governor of New York, 2026).

Costs and Revenue

Prior to the start of tolling, TBTA incurred $33.9 million in operating expenses. Since tolling began, monthly operating expenses have ranged from $8.7 million to $13.5 million. These operating expenses do not include debt service on CRZ tolling infrastructure financing, which is approximately $1.6 million per month.

In its first year, the CRZ program was projected to generate at least $500 million in net operating revenue (toll revenue minus operating expenses). Results to date indicate the program remains on track. In 2025 year-to-date, monthly toll revenue averaged $57.3 million.

Net operating revenue from CRZ tolling is being used to support MTA capital investments. Of the $467.8 million in net revenue collected through October 2025, TBTA:

- Paid $15.8 million in interest on notes issued to finance CRZ infrastructure
- Used $145.7 million to retire maturing infrastructure notes on November 3, 2025
- Set aside $20 million for expected mitigation expenses
- Held $10.1 million in funds on hand and receivables.

The remaining $276.2 million was deposited as collateral for a $500 million CRZ loan to finance eligible transit and commuter rail capital projects.

Under the Traffic Mobility Act, the program must ultimately generate sufficient net annual revenue to support $15 billion in MTA capital projects included in the 2020–2024 MTA Capital Program. The MTA is advancing projects backed by this funding, including Second Avenue Subway Phase 2, new rolling stock for the LIRR and Metro-North Railroad, ADA accessibility improvements, and major state-of-good-repair and system enhancement projects.

To accelerate delivery, TBTA also issued $1.0 billion in short-term debt in 2025 to finance eligible MTA transit and commuter rail projects, to be refinanced later with bonds backed by CRZ tolling revenue. This is in addition to $378.8 million in previously issued notes used to finance CRZ infrastructure costs. The MTA has identified approximately $4.5 billion in recently committed 2020–2024 capital projects that may be funded—fully or in part—through CRZ tolling revenue or debt secured by anticipated CRZ revenues. As of November 19, 2025, $495.9 million of CRZ-related proceeds had been spent on eligible transit and commuter rail capital projects (MTA, 2026).

Notably, the authority has not made available data on uncollected revenue, such as the number of car entries to the zone that qualify as “same day ‘repeats’” or the number of vehicles avoiding the congestion toll altogether by virtue of their official status, license plate tampering, or detection failure (Komanoff, 2026).

Equity

New York's approach includes a broader package of features that pair pricing with equity protections, mitigation commitments, and complementary freight and emissions strategies. Several of these program attributes are the results of long-time advocacy for an equitable tolling program. There is a low-income discount program, and some revenues go towards place-based mitigations targeted to communities identified as experiencing high pollution burdens, such as school air filtration, roadside vegetation, park upgrades, asthma case management expansions, and freight-focused measures such as replacing diesel transport refrigeration units and providing truck electrification infrastructure.

Political Considerations

New York City's congestion pricing program illustrates that achieving durable road pricing policy in the United States can be more of a political accomplishment than a technical one. Its eventual implementation followed over two decades of coalition-building, strategic framing and re-framing, and legislative maneuvering—evolving even before Mayor Bloomberg's failed 2008 effort into a transit-crisis-driven campaign that aligned advocates with gubernatorial leadership under Governor Cuomo and later Governor Hochul.

Packaging the Traffic Mobility Act within the 2019 state budget proved decisive, allowing legislators to support the broader fiscal package while minimizing exposure to a standalone vote on tolling (Chen, 2025). Philanthropic investment sustained advocacy during setbacks, including federal delays under the Trump Administration and the 2024 gubernatorial "pause," when public mobilization intensified and shifted opinion measurably in favor of the program.

Project Successes, Challenges, and Key Lessons Learned

New York City's Congestion Relief Zone tolling program demonstrates that sustained political strategy and institutional design are as critical to success as technical performance. After more than two decades of failed proposals, the program's eventual enactment succeeded by positioning congestion pricing as both a congestion management tool and a dedicated transit revenue source during a moment of acute financial distress for the transit system. Embedding the Traffic Mobility Act within the state budget provided political cover for state legislators.

Early performance metrics indicate that the program has delivered measurable results: double-digit reductions in entries to the zone, meaningful improvements in travel speeds and bus performance, reductions in crashes and emissions, and net operating revenues on track to reach at least $500 million in the first year. These outcomes show that cordon pricing can simultaneously reduce vehicle volumes, improve safety and air quality, and generate substantial capital funding when supported by clear statutory guardrails and transparent reporting.

At the same time, the program underscores the fragility of major pricing reforms in the U.S. federalist system. Federal approval delays, ongoing litigation, and the February 2025 rescission attempt by USDOT illustrate how road pricing remains politically and legally contested even after implementation. Political pressure on

Governor Hochul to lower the toll rate from $15 to $9 prior to the toll being enacted, a reduction that likely tempered the program's congestion and revenue impact relative to what a higher toll might have achieved. Focusing on revenue generation alongside congestion relief broadened support but also provided critics with grounds to challenge the program's intent under federal pilot authorities.

Key lessons include the need for diversified political coalitions that can withstand executive shifts, disciplined fiscal transparency to maintain public trust, and contingency planning for federal and legal risk. New York's experience suggests that successful congestion pricing in the United States depends less on technical feasibility than on long-term political commitment, coalition resilience, and institutional credibility. Additionally, New York's experience shows that while political support for the program may be low before enactment, and can steadily rises once people experience the benefits.

3.9 Virginia I-66 Inside the Beltway HOT Lanes

Project Origin and Objectives

I-66 in Virginia was built to serve east-west travel from I-81 near Strasburg, Virginia, in the west, to Washington, D.C. in the east (See **Figure 8**). A portion east of its intersection with I-495 opened in 1982 as HOV-4 during peak hours and in peak directions. Over time, occupancy restrictions were loosened over time until became HOV-2 in 1995, though solo drivers were not allowed to enter the corridor during times designated for carpools only.

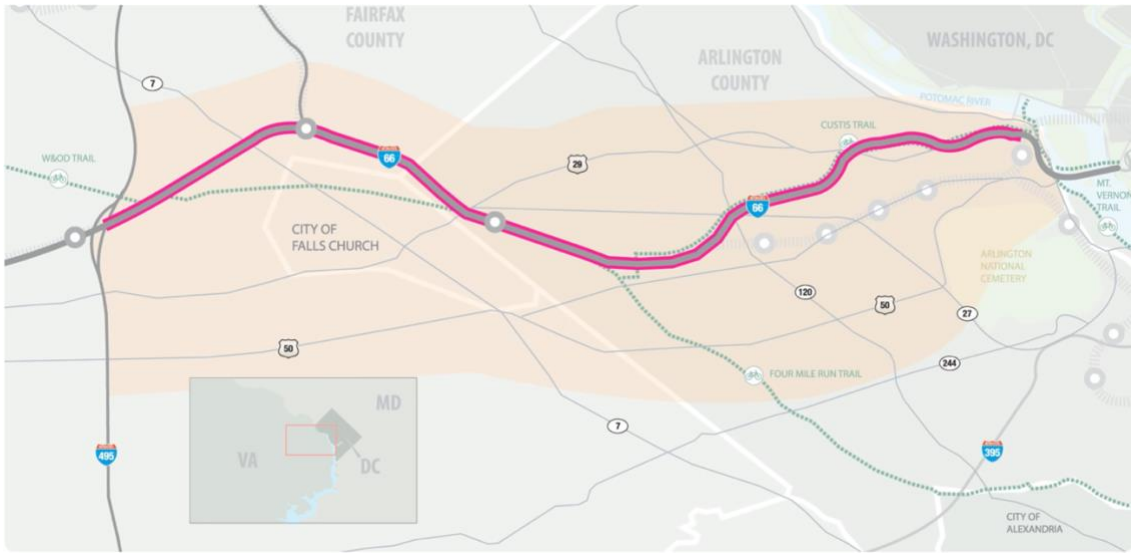

Figure 8. Map of I-66 Inside the Beltway Lanes

As the only east-west highway in the region, the corridor experiences extremely heavy congestion throughout the day, with the highest levels eastbound towards Washington D.C, in the morning and the westbound during the afternoon.

In December 2017, the Virginia Department of Transportation (VDOT) commenced tolling along the ten miles of I-66 between the Capital Beltway and U.S. 29 in Rosslyn, Virginia. The program, known as I-66 Inside the Beltway, was designed to 1) move more people; 2) enhance transportation connectivity, 3) improve transit service, 4) reduce roadway congestion, and 5) increase travel options. The conversion a carpool-only facility to a tolled one is a unique feature of this project

All drivers, regardless of status, must travel with a transponder. SOV users are charged in the eastbound direction from 5:30 – 9:30 a.m. and westbound from 3:00 – 7 p.m., Monday through Friday. Tolls are dynamically priced to manage demand and keep traffic moving, with a policy of maintaining an average speed of 55 mph. HOV3+ vehicles travel toll free with an E-ZPass Flex., (Nohekhan et al, 2021).

Metrics and Performance

Between 2019 and 2024, average speeds increased while travel times declined on I-66 Inside the Beltway from 2019 through 2024. In **Table 3** below, this information is separated for the eastbound AM peak period (5:30-9:30 AM) and the westbound PM peak period (3:00-7:00 PM). Eastbound speeds during the morning peak rose from 49.4 mph in 2019 to a high of 61.8 mph in 2021, before dropping to between 57 and 59 mph range from 2022 through 2024, still well above the 2019 baseline. Travel times fell from 12.7 minutes in 2019 to between 10 and 11 minutes 10 in the years since. Westbound performance during the evening peak improved similarly through 2021, peaking at 58.8 mph and 10.8 minutes, but has eased somewhat since, reaching 55.2 mph and 11.5 minutes in 2024, also still below 2019 levels.

Table 3. Average Speed and Travel Time, 2019–2024

	2018	2019	2020	2021	2022	2023	2024
Eastbound (5:30 AM - 9:30 AM)							
Average Speed (MPH)		49.4	58.4	61.8	57.2	57.8	58.7
Travel Time (Minutes)		12.7	10.7	10.1	10.9	10.8	10.6
Westbound (3:00 PM - 7:00 PM)							
Average Speed (MPH)		53.1	57.1	58.8	57.3	57.1	55.2

	2018	2019	2020	2021	2022	2023	2024
Travel Time (Minutes)		12.0	11.1	10.8	11.1	11.1	11.5
Express Lanes							
Average Daily Trips Eastbound	14,604	14,416	9,109	10,639	13,350	15,235	15,829
Average Daily Trips Westbound	17,442	17,416	11,611	14,022	16,779	18,172	18,766
E-ZPass in HOV (Free) Mode†	43.13%	43.73%	29.56%	26.27%	27.78%	22.62%	23.00%
E-ZPass in Toll Mode	44.67%	45.61%	55.13%	58.82%	58.51%	61.56%	61.71%
Vehicles Using E-ZPass	87.80%	89.34%	84.69%	85.09%	86.30%	84.18%	84.71%

Source: VDOT Performance Report for 2024 I-66 Express Lanes Inside the Beltway, 2018-2024

Traffic Congestion and Mode Shift

Since opening in December 2017, the I-66 Express Lanes have met their goal of providing faster, more reliable travel. Travel speeds and times on I-66 and parallel roadways have generally improved since the program began (VDOT, 2025). The tolling policy on a portion of the Inner Beltway has been more successful than the previous HOV operation primarily by changing users' departure time to before or after the tolling hours. The median morning eastbound travel time has decreased by 25% (from 20 to 15 min). Additionally, the tolling system improved travel time and travel time reliability on the I-66 Inner Beltway and its toll-free alternative routes (Nohekhan et al, 2021).

Also, the prediction that converting HOV to HOT lanes would pull drivers from local roads onto I-66 was borne out, and in 2024, speeds on parallel roadways were faster than before the program began. In addition, by 2018, 40% of commuters were traveling on the corridor by transit (NVTC, 2018).

The I-66 Inner Beltway corridor moved more people more efficiently in 2019 than in 2015. The total number of people moving inbound during the morning rush hour increased by 1.2% while the number of vehicles decreased by 2.7%. Overall, 65% of the corridor's morning rush-hour inbound trips were made by transit or HOV in early 2019, compared to 64% in 2015 (NVTC, 2020).

Economic Value

One study estimated drivers' imputed value of time by comparing the toll paid on I-66 to the minutes saved relative to the fastest free alternative route, finding a value ranging from about $10 to $300 per hour, with a median of roughly $70 per hour (Nohekhan et al, 2021). This shows that many commuters see real economic value in the tolling program because the time they save is worth more to them than the money they pay.

Costs

In 2016, the Virginia Commonwealth Transportation Board (VCTB) awarded $60M in two contracts for construction of the tolling system, with groundbreaking occurring in August 2016. The tolling program began on November 30, 2017. Unlike other express lane programs such as I-495 and I-95 in Virginia, I-66 is not operated by a concessionaire. This means that all motorists' tolls go to pay for the improvements.

Revenue

Table 4. I-66 Inside the Beltway HOT Lanes Annual Revenue, FY2019–FY2026

Fiscal Year	Revenues
FY19	$25.3m
FY20	$25.4m
FY21	$8m
FY22	$15.2m
FY23	$18m
FY24	$32.5m
FY25	$35.9m
FY26	39.7m

Source: VDOT Fiscal Year Annual Budgets for FY19 – FY26

Equity

Express lanes toll revenues fund the Commuter Choice program, which was established in 2017. The program reinvests toll revenue back in the corridor through a competitive grant process that funds multimodal transportation programs and transportation demand management services in the corridor. The program has been expanded to include other Virginia Express Lanes programs. Projects funded through the Commuter Choice program include:

- New and expanded commuter bus services
- Improvements to Metro and VRE facilities
- Expanded bicycle and pedestrian networks near transit stations
- Roadway improvements to help transit and carpools
- Transportation system management technology and strategies
- Transportation demand management campaigns and programs.

Political Considerations

While several studies from the late 90s on evaluated tolling on the I-66 corridor, the genesis of the 2017 program was a result of efforts championed by Virginia Secretary of Transportation Aubrey Layne. (It is worth noting that VDOT, compared to other state DOTs, controls an unusually large number of roads and has considerable power under the governor.) Layne touted a 2012 and 2013 study released by then Governor McDonnell's administration that stated dynamic tolling and multi-modal improvements could move more people a day and increase travel speeds (VDOT, 2012 and 2013). While critics of tolling advocated for freeway widening, Layne emphasized that the state had limited resources that needed to be used wisely to protect the public's dollars. He supported tolling as more cost effective than paying to widen the lanes.

Layne and his team emphasized a self-financing program that could improve mobility through the corridor by moving more people, not more vehicles by permitting single drivers to legally use the corridor by paying a toll (VDOT, 2017).

Widening

The original plan proposed widening I-66 eastbound to three full lanes from the Dulles Connector Road to the Ballston exit based on an evaluation of the road's performance after tolling went into effect. The project would be paid for with toll revenues. However, then Governor McAullife's administration agreed to speed up the widening of I-66 in a compromise with legislators who were opposed to imposing tolls (Thomson, 2016). This deal may have prevented the General Assembly from passing legislation to block tolling before the widening could take place (Thomson, 2016). This additional travel lane opened in December 2020, and the project was funded with a combination of federal and state proceeds.

Governance via Memorandum of Agreement (MOA)

A Memorandum of Agreement (MOA) between VCTB, VDOT, and the Northern Virginia Transportation Commission (NVTC) details the specific responsibilities of each agency. The 40-year agreement states the program will be implemented jointly by VDOT and NVTC. VDOT is responsible for 1) operations and maintenance, 2) tolling, and 3) roadway improvements. NVTC is responsible for 1) selecting multimodal improvements, 2) ensuring compliance with the agreement and applicable law, and 3) reporting on use of funds (Donohue, 2015).

Authority to Toll

Section 166 of Title 23 of the U.S. Code governing HOV facilities, enables existing HOV lanes to be converted to tolled operation provided that the local MPO endorses the use and amount of tolls in the converted lanes. Section 166 also stipulates that all tolls on new lanes must be variably priced and collected electronically. To implement tolls on an existing HOV lane, project sponsors must demonstrate that the conditions on the facility are not already degraded and that the presence of paying vehicles will not cause conditions on the facility to become degraded. Ongoing annual reporting documenting conditions on the converted lanes is also required, and if the HOV facility becomes degraded the sponsor must bring the facility into compliance either by increasing HOV occupancy requirements, increasing tolls, increasing capacity, or eliminating access to paying motorists.

Whenever an HOV lane is converted to a HOT lane, the states must annually certify to FHWA that they meet the operational requirements stipulated in Section 166. They must demonstrate that the presence of paying vehicles in the HOT lane has not caused traffic service to be degraded. They must demonstrate programs in place to inform motorists of how they may enroll and use the managed lane, and must indicate they have or will have an automated electronic toll collection system in place.

Criticism

Concerns about the project included a desire to keep the facility at HOV-2, traffic diversion onto parallel routes, the overall cost of the toll, and the timing of widening eastbound lanes between Dulles Connector Road and Ballston.

Project Successes, Challenges, and Key Lessons Learned

The conversion of I-66 Inside the Beltway from an HOV facility to dynamically priced HOT lanes has largely achieved its stated objective of moving more people, not more vehicles, through one of the region's most constrained corridors. Since tolling began in 2017, the facility has consistently met its 55-mph performance target during priced periods, with median morning eastbound travel times declining by 25% and overall travel time reliability improving both on I-66 and on parallel roadways.

Importantly, the policy has demonstrated meaningful demand management effects: drivers adjusted departure times to avoid peak toll windows, overall inbound vehicle volumes declined even as total person-throughput increased, and transit and HOV mode share rose modestly.

The program has also generated a stable and growing revenue stream—rebounding strongly post-pandemic—that funds multimodal improvements through the Commuter Choice program, reinforcing the corridor's transit and transportation demand management network. Together, these outcomes underscore the effectiveness of pricing as a congestion management strategy.

At the same time, the project illustrates the political, institutional, and statutory complexities inherent in converting an existing HOV lane to tolled operation. The program required strong executive leadership to withstand criticism around toll levels, diversion concerns, and calls for road widening prior to pricing. A negotiated compromise ultimately helped defuse legislative efforts to block tolling, highlighting the importance of political coalition-building. Implementation was further shaped by a 40-year interagency agreement clarifying responsibilities among VCTB, VDOT, and NVTC, with NVTC specifically tasked with ensuring compliance with federal HOV-to-HOT requirements under 23 U.S.C. §166, which mandates that HOT conversion does not degrade HOV performance.

Notably, the desktop literature on this program did not include description of a driving role played by transportation advocates in advancing tolling, compared to New York's program. Transit advocates did voice support but did not necessarily play an instrumental role in catalyzing the program (Coalition for Smarter Growth, 2015).

6. Key Takeaways

Pricing is more likely to move forward in California when there is key stakeholder support beyond the initiating agency. Pricing has been successful in California when the agency implementing it has a strong partner. In Los Angeles, Metro was able to move ExpressLanes forward in part because the federal government (and its resources) was part of the deal. In the Bay Area, strong support from local technology companies wanting to move their employees through congestion was a critical factor in enabling pricing. In other areas, where pricing did not move forward, the agencies that advocated for pricing acted as a lone stakeholder. For example, in San Diego, SANDAG was pushing pricing without any significant support from the business community or state or federal government. Similarly, SCAG's pricing study failed to advance in part because they had not secured any solid allies before making their recommendation. Pricing is unlikely to succeed or move forward because of a "study" alone. Pricing is more likely to move forward when it is clear who benefits and for those beneficiaries to be powerful politically.

Multiple champions are needed to sustain a pricing concept over time. As pricing can be a controversial proposal, a champion is typically needed to put it forward. This can be seen with SANDAG, LA Metro, and SCAG. However, sustained champions over time will typically be needed for pricing to become reality, because the timeline for implementation can be long. For example, New York had multiple champions for pricing over decades, including mayors and governors who were long gone by the time pricing was implemented there. In Virginia, where governors can only serve a single four-year term, many years of policies such as restricting single occupant drivers on the I-66 corridor in the beltway during peak periods preceded pricing.

Pricing as a mechanism for raising revenue is likely to face substantial obstacles in California. Where congestion pricing has been successfully implemented in California, it has been proposed as a mechanism to avoid congestion; it has not been proposed as a means of raising revenue. This contrasts with New York, which has a much larger transit-riding constituency, and was therefore able to get pricing through by promoting it as a way to improve transit. At LA Metro, when pricing was initially proposed as a mechanism for raising revenue, the Board asked staff to specifically pursue it as a congestion reduction mechanism instead, likely due to fear of political backlash. Given California's strong history of self-help counties raising revenue for transportation through sales taxes, asking the public to contribute through yet another mechanism can be politically fraught.

Pricing as a mechanism for reducing congestion has proven popular and politically sustainable once implemented. We found no evidence of any pricing initiative (in California or elsewhere) that was repealed after implementation. Priced lanes in the Bay Area and Los Angeles continue to prove popular among users and have produced substantial benefits for their respective regions. Despite some backlash at the onset, both Virginia and New York's pricing schemes have proven popular and beneficial. A key lesson is that demonstrations and pilot projects can deliver the base of experiential support among drivers and voters whereas abstract arguments about system-wide benefits from pricing may not be as effective.

Local pricing programs are more likely to succeed with support from higher government levels. Efforts to implement pricing as an agency initiative alone are unlikely to succeed. For example, LA Metro's Traffic Reduction Study was pursued as an independent pricing initiative without state or federal backing and has (so far) gone nowhere. By contrast, LA Metro's ExpressLanes project, along with efforts in New York, and Virginia have been successful with state (New York and Virginia) or federal (LA Metro) government support. State incentives or initiatives related to pricing are more likely to result in implementation than purely local efforts. For California, the design of any pricing program must identify where significant opposition may arise and, if possible, structure the program to minimize exposure to it.

In order for pricing to move forward more expeditiously in California, the Legislature, CalSTA, and Caltrans will need to take a clear pro-pricing position. The California Legislature effectively has veto power over any pricing program, which can deter local initiatives. CalSTA does not explicitly promote pricing as policy, and Caltrans does not typically provide assistance to specific pricing initiatives. This has delayed, for example, the expansion of Express Lanes in Los Angeles. But it has also meant that cities trying to move forward with pricing initiatives, such as San Francisco and Los Angeles, are left to fight the political battles on their own. Establishing state enabling legislation for regions to pursue pricing on local projects would help ensure smoother implementation. In contrast, a region-by-region approach has proven more challenging politically and institutionally. While the federal role has encouraged pricing, state and local positions have varied.

Pricing is more likely to succeed when the problem it is meant to solve is clearly identified before the solution is proposed. If an agency proposes congestion pricing before having defined the problem that needs solving, the proposal may face a stronger challenge. The case studies in this report revealed that while climate and VMT reduction are key outcomes of pricing, those arguments are not always political winners. More tangible outcomes such as congestion reduction are more likely to win support. It is likewise important to make a clear economic argument on behalf of congestion pricing and gather data to demonstrate the benefits. This can help insulate pricing programs against political pushback. The research we reviewed revealed that ongoing public outreach to demonstrate the pricing program's direct benefits is key to building acceptance. Agencies often underestimate the importance of continuous political and public engagement. This work needs to continue even after the formal studies are completed.

Equity concerns will arise from pricing and planners and program designers who do not engage with those issues leave an opening that opponents will use. Planners should highlight several key equity features, including access to payment systems, transit investments, and income-based discounts, to counter common criticisms opponents use to undermine pricing proposals. Tackling concerns with pricing requires not just looking at who pays but also how everyone gains from a less congested and cleaner transportation system.

7. Conclusion

While the limited access highway was first established in Germany and Pennsylvania, California was the place that elevated the “freeway” as a defining metaphor for growth and mobility. Even though the term “freeway” refers to the flow of traffic rather than the price, in California, the highway was instituted as a "free” mode of travel, with no visible barrier or cost to enter. Tolls and toll roads now exist but are still limited. Keeping freeways unpriced is a collective policy choice California continues to make, even as there is greater awareness of the social costs in congestion, emissions, health, fatalities, and lost productivity.

Pricing finite, shared infrastructure to manage demand and generate better societal outcomes is not a new idea. And it is not unique to transportation. Water utilities moved to metered and tiered rates when flat pricing approaches led to overconsumption of a scarce resource: clean drinking water. Some airports charge landing fees that vary by time and congestion because runway capacity is finite and there is a need to meter runway space during peak periods. Most recently, electric utilities have shifted to time-of-use pricing for the same reason. Since the grid is interconnected and demand shifts throughout the day, a price signal encourages individuals to shift their time or overall usage. In each case, the change to enact pricing was resisted. But in all cases, the pricing system proves popular and works to adjust behavior and manage a shared infrastructure once implemented.

The academic literature, reports, and case studies reviewed in this white paper show that where pricing has been implemented (in Los Angeles, the Bay Area, Virginia, and New York) it has reduced congestion, generated revenue, and proven more durable politically than some observers initially expected. Pricing as a mechanism to manage congestion can work. There are also many examples of pricing ideas that did not go forward, at least initially, including SFCTA's downtown San Francisco study, SANDAG's Road User Charge in San Diego, SCAG's Westside Go Zone proposal in Los Angeles, and New York's failed 2008 attempt that preceded its eventual 2025 success. The evidence presented here reveals that implementation is the hard part. It requires sustained champions, state enabling legislation, stakeholder coalitions with something real at stake, and equity considerations built in from the start.

This white paper and the reviewed reports give substantial evidence about how pricing is an effective tool to tackle congestion and support other social goals. With the body of evidence from within the state and from around the country, policy makers should be better equipped to know how to move pricing projects effectively forward. This paper also includes evidence here about where and even when to move forward with pricing. As states and regions pursue additional pricing projects learning the lessons of what made for successful—and less successful—efforts will continue to be important.

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