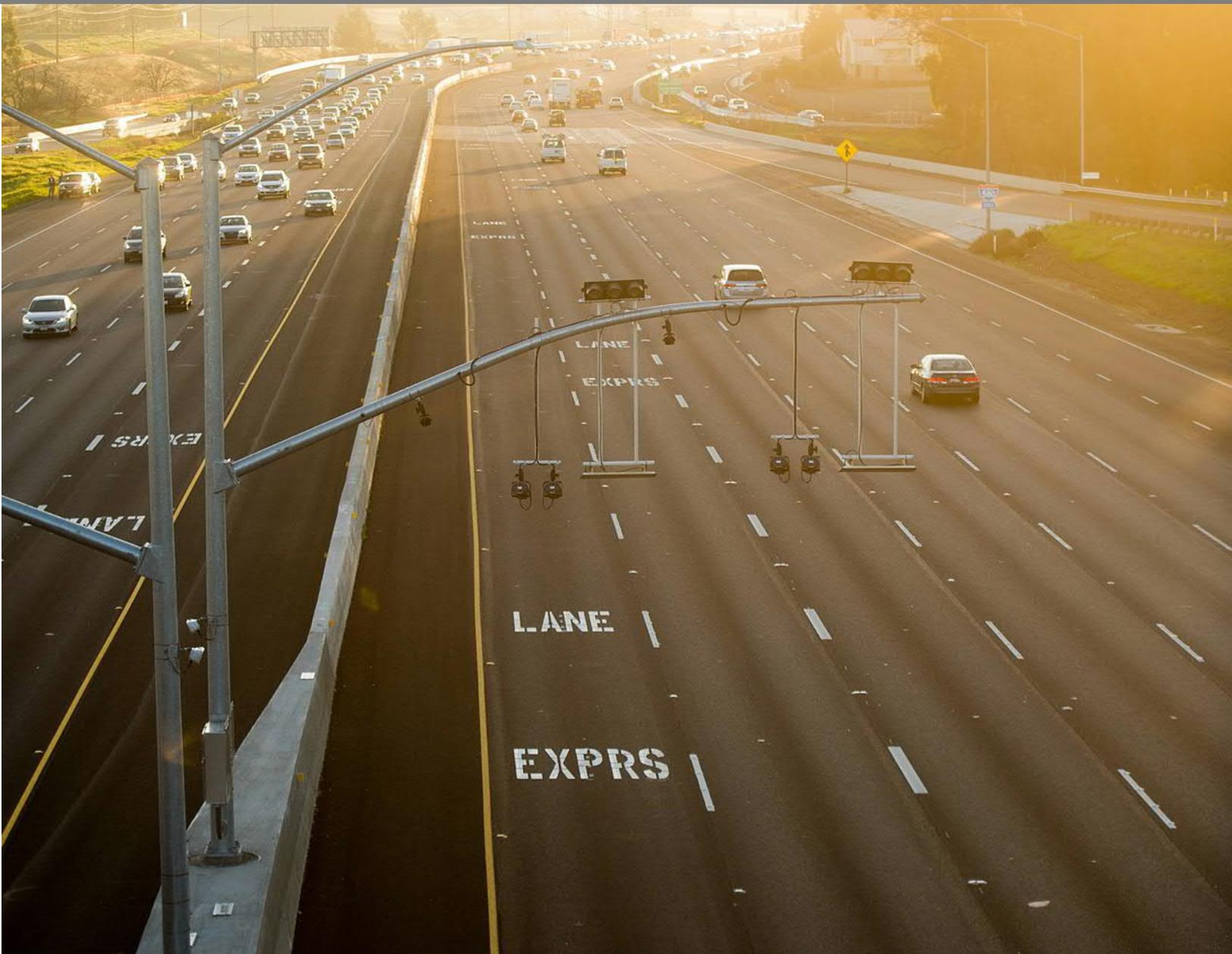


Connecting the Bay Area

Express Lanes Network 2021 Strategic Plan
April 2, 2021



**METROPOLITAN
TRANSPORTATION
COMMISSION**

EXPRESS LANE

 TOLL TO

Airway Blvd/Isabel Ave  **\$0.30**

Greenville Rd  **\$1.10**

HOV 2+ WITH  **NO TOLL**

El Chorro Road
Fallon Road



Contents

Executive Summary	1
Abbreviations	4
1 Purpose	5
1.1 Overview.....	6
1.2 Background.....	6
2 Network	9
2.1 Vision.....	10
2.2 Process to Refine the Network	11
2.3 Network Recommendation	13
3 Strategy.....	15
3.1 Context	16
3.2 Achieving strategic goals and managing demand under continued growth	17
3.2.1 GHG/VMT Reduction	17
3.2.2 How to Better Serve Transit.....	19
3.2.3 Equity	20
3.2.4 Strategic Investment Principles.....	25
3.3 Considerations for the buildout and operation of the network	26
3.3.1 Interconnectedness	26
3.3.2 Enforcement	28
3.3.3 Consistent Operating Policies	31
3.3.4 Funding and Financing.....	33
3.4 Establishing expectations for upcoming disruptions	36
3.4.1 COVID-19 Long-Term Impacts.....	36
3.4.2 Additional GHG/VMT Reduction	37
3.4.3 Clean Air Vehicles, Connected Vehicles, and Autonomous Vehicles	37
4 Continuing Work.....	39
4.1 Recommendations	40
4.1.1 GHG/VMT Reduction	40
4.1.2 Express Bus	40
4.1.3 Strategic Investment Principles.....	42
4.1.4 Funding and Financing Strategies.....	42
4.2 Near-Term Actions	43
4.2.1 Equity.....	43
4.2.2 Consistent Operating Policies	43
4.2.3 Enforcement	43
4.2.4 Road Pricing Strategies	44
4.2.5 Plan Bay Area 2050.....	44
4.3 Conclusion	44
5 Appendices.....	45
5.1 Additional Considerations for Upcoming Disruptions.....	46
5.2 VMT/GHG IMPACTS AND MITIGATIONS WHITE PAPER	51
5.3 EXPRESS BUS WHITE PAPER.....	80
5.4 STRATEGIC INVESTMENT PRINCIPLES WHITE PAPER	104
5.5 FUNDING AND FINANCING STRATEGIES WHITE PAPER	118

A photograph of a road at night. The word "EXPOS" is painted in large, white, block letters on the asphalt. A yellow line runs vertically on the left side of the frame. In the upper center, the blurred red taillights and white license plate of a car are visible. A person is walking across the road, their silhouette partially overlapping the letters of "EXPOS".

EXPOS

Photos by Noah Berger

Executive Summary

The Express Lanes Network 2021 Strategic Plan describes how the Metropolitan Transportation Commission (MTC) seeks to implement a system of managed lanes in the San Francisco Bay Area that is not only cost-effective and self-supporting, but also helps achieve the regional goals of reducing greenhouse gas emissions, supporting transit priority, promoting use of transit and other high-occupancy modes, and advancing equity throughout the region in accordance with Plan Bay Area 2050 and MTC's Equity Platform. Having collaborated on the Strategic Plan with regional express lanes partners for over a year, MTC hopes to transform the broader Express Lanes Network purpose, goals, and strategies into concrete actions that will keep both the network and the region thriving over the next thirty years.

The Strategic Plan is organized into four parts as shown below in Figure 1.



Figure 1: Strategic Plan Organization

Vision and Goals

The Bay Area Express Lanes Network is conceived as a robust regional network of dedicated lanes that primarily serves people in carpools and buses. The network leverages the investment made in the region's High-Occupancy Vehicle (HOV) lanes by making use of existing capacity to move more people, closing gaps in or expanding the managed lane system, and improving operations to provide priority to carpools and buses, thereby expanding their use. The development of the network is a cooperative effort between MTC, several Bay Area County Transportation Authorities (CTAs), Caltrans, and the California Highway Patrol (CHP), with input from other stakeholders who are invested in the success of the network like transit operators and those advancing equity, carpooling and vanpooling.

As the region continues to build out the Express Lanes Network, several parallel regional developments have been gaining momentum, warranting a renewed scope and vision for the network. These include:

- A commitment to ensuring equitable access to mobility options for all Bay Area residents, with intentional focus on those with the least resources to truly improve access to opportunity;
- An increased attention on utilizing the Express Lanes Network to prioritize regional transit service;
- A strong emphasis on strategies to reduce vehicle-miles traveled (VMT) and greenhouse gas (GHG) emissions; and
- A general desire to increase the cost effectiveness of the network buildout.

The Express Lanes Network’s program goals reflect these broader regional trends:

Express Lanes Network Goals

1. Manage congestion and bring reliability to the traveling public
2. Increase person throughput by creating a seamless network that incentivizes the use of transit, vanpools, and carpools
3. Minimize greenhouse gas emissions
4. Focus on equity to improve transportation access and affordability, especially for Communities of Concern¹
5. Deliver Bay Area Express Lanes Network in a timely manner
6. Be responsible in the use of public funds

Strategy

The Strategic Plan includes research on a variety of topics to explore how the network can achieve these goals and align with regional priorities. Strategic Plan topics are organized into the following focus areas:

1. Achieving Goals: The operational and programmatic strategies, as well as additional infrastructure investments beyond those typically considered for baseline express lane functionality, that will help the Express Lanes Network better align with regional goals;
2. Building the Network: Moving beyond how we achieve goals into the practical considerations of how the network is being built and what is important for the network’s healthy functioning; and
3. Planning for Change: Looking further into the future to establish expectations for upcoming disruptive events, policies, and technologies.

These focus areas break down further into individual areas of study. Achieving Goals incorporates GHG/VMT reduction, transit, equity, and strategic investment principles; Building the Network emphasizes the importance of interconnectedness, enforcement, consistent operating policies, and funding and financing; and Planning for Change looks at the potential impacts of the COVID-19 pandemic, additional expected regional and state GHG reduction strategies, and clean air vehicles. Many of these topics are expanded upon in individual white papers, which are separately included as Appendices in Section 5.

¹ Communities of Concern are census tracts identified under Plan Bay Area 2050 whose demographic characteristics place them in excess of established thresholds for a combination of factors, including concentration of the population that is minority, low income, limited English proficiency, zero-vehicle, seniors 75 and older, disabled, single-parent families, and/or severely rent-burdened.

Continuing Work

The Strategic Plan findings inspired MTC to offer the following recommendations and near-term actions for the express lane partners:

Recommendations	GHG/VMT Reduction	Promote regional- and county-level mitigation solutions. Advocate for legislation that allows pilots for the conversion of general purpose lanes to express lanes.
	Express Bus & Transit	Work with transit planners and operators to enhance transit priority and improve accessibility to the express lanes for express buses and other high-occupancy modes through capital investments. Since express bus may not perform well everywhere, establish clear criteria and performance metrics to prioritize corridors and guide investments in express bus services.
		Advocate for transit operators to increase transit network connectivity, coordination, and communication to take full advantage of the regional Express Lanes Network.
		Identify opportunities to link transit & transportation demand management (TDM) investments with SB-743 mitigation strategies while acknowledging operations funding challenges.
	Strategic Investment Principles	Adopt the framework and investment principles based on two categories: Merit and Readiness, where merit considers factors like equity, greenhouse gas reduction, and cost-effectiveness, among others.
	Funding and Financing Strategies	Actively pursue state and federal funding opportunities.
Advocate to include the Express Lanes Network buildout in any future regional funding measure.		
Near-Term Actions	Equity	Execute a means-based tolling pilot that ties into the FasTrak® Customer Service Center Equity Action Plan to analyze how providing reduced toll rates to low-income users delivers equitable benefits and affects express lane operations. Undertake other equity initiatives and coordinate where applicable.
	Consistent Operating Policies	Come to a regional consensus on a process for reviewing toll and operating policies for consistency and execute a Memorandum of Understanding (MOU) with CTAs, BAIFA, Caltrans, and CHP.
	Enforcement	Continue work on current, automated HOV enforcement pilots, including camera-based occupancy detection and app-based occupancy declaration; Track other emerging technologies.
	Road Pricing Strategies	Incorporate key Express Lanes Network questions in a study of highway pricing strategies to begin in 2022.
	Plan Bay Area 2050	Integrate the findings and recommendations from the Express Lanes Network Strategic Plan to inform the Implementation Plan of Plan Bay Area 2050, where appropriate, to further advance regional strategies.

Abbreviations

BART	Bay Area Rapid Transit
BATA	Bay Area Toll Authority
BUILD	Better Utilizing Investments to Leverage Development Transportation Discretionary Grant
CAV	Clean Air Vehicles
CV/AV	Connected Vehicles and Autonomous Vehicles
CEQA	California Environmental Quality Act
CHP	California Highway Patrol
CTOC	California Toll Operators Committee
FAST	Fixing America's Surface Transportation Act
GHG	Greenhouse Gas
HOV	High-Occupancy Vehicle
INFRA	Infrastructure for Rebuilding America Discretionary Grant Program
LPP	State-Local Partnership Program
MOU	Memorandum of Understanding
MTC	Metropolitan Transportation Commission
P3	Public-Private Partnership
RCSC	FasTrak® Regional Customer Service Center
RM3	Regional Measure 3
SB-743	Senate Bill 743
SCCP	Solutions for Congested Corridors Program
SOV	Single-Occupancy Vehicle
TAC	Technical Advisory Committee
TCEP	Trade Corridor Enhancement Program
TDM	Transportation Demand Management
TIFIA	Transportation Infrastructure Finance and Innovation Act
VMT	Vehicle-Miles Traveled
VOD	Vehicle Occupancy Detection



1 Purpose

1.1 Overview

The Bay Area Express Lanes Network is a system of managed lanes currently operating and expanding throughout the region's highway network. The express lanes use pricing to manage traffic and maintain reliable travel conditions to increase person throughput. Like High-Occupancy Vehicle (HOV) lanes, the express lanes provide a free travel time benefit to people traveling in a high-occupancy mode, thus encouraging carpooling and transit usage. Vehicles not meeting carpool eligibility requirements can also benefit by paying a toll to use available capacity in the express lanes. This provides a source of revenue to fund the development, maintenance, rehabilitation, and operation of the express lanes. Net toll revenue can be reinvested in the corridors for other transportation or equity improvements.

The purpose of this Strategic Plan is to chart a vision for the continued buildout of the Express Lanes Network in a way that aligns with the regional goals and priorities identified under Plan Bay Area 2050,² the Bay Area's Regional Transportation Plan and Sustainable Communities Strategy expected to be adopted in July 2021. Plan Bay Area 2050 is focused on creating a future for the Bay Area that is affordable, connected, diverse, healthy, and vibrant for all. While MTC has authored the Strategic Plan, in collaboration with express lane partners, the findings and near-term actions will need to be embraced and pursued by all the express lane partners to achieve this vision.

As a living regional document, the Strategic Plan is meant to be updated over time by a collaboration of all express lane partners, particularly in reference to near-term actions and regional developments on the topics of equity, regional consistency, enforcement, transit priority, and the concurrent development of a more robust regional transit and express bus network. The Strategic Plan also informs other plans that contribute to the continued buildout of the network. In addition to working towards achieving the broader vision for the region by informing the development of the Plan Bay Area 2050 Implementation Plan, the Strategic Plan serves to help express lane operators and stakeholders create consistent expectations and best practices on how to balance the practicalities of local buildout with regional, state, and federal initiatives and directives.

1.2 Background

The buildout of the Bay Area Express Lanes Network is being carried out by several Bay Area agencies, each with their own authority to implement and operate a portion of the overall network, as shown in Figure 2, below. To ensure a seamless, holistic vision, the Metropolitan Transportation Commission (MTC), express lane operators, and other local, regional and state authorities and stakeholders have collaborated to develop this Strategic Plan for the continued buildout and operation of the Express Lanes Network, largely through participation in the Regional Express Lanes Technical Advisory Committee (TAC). This committee, which includes agencies vested in planning, implementing, and operating the Express Lanes Network, works to maintain communication and build consensus around many express lanes-related topics.

² https://www.planbayarea.org/sites/default/files/pdfs_referenced/PBA2050_Draft_BPStrategies_071320_0.pdf

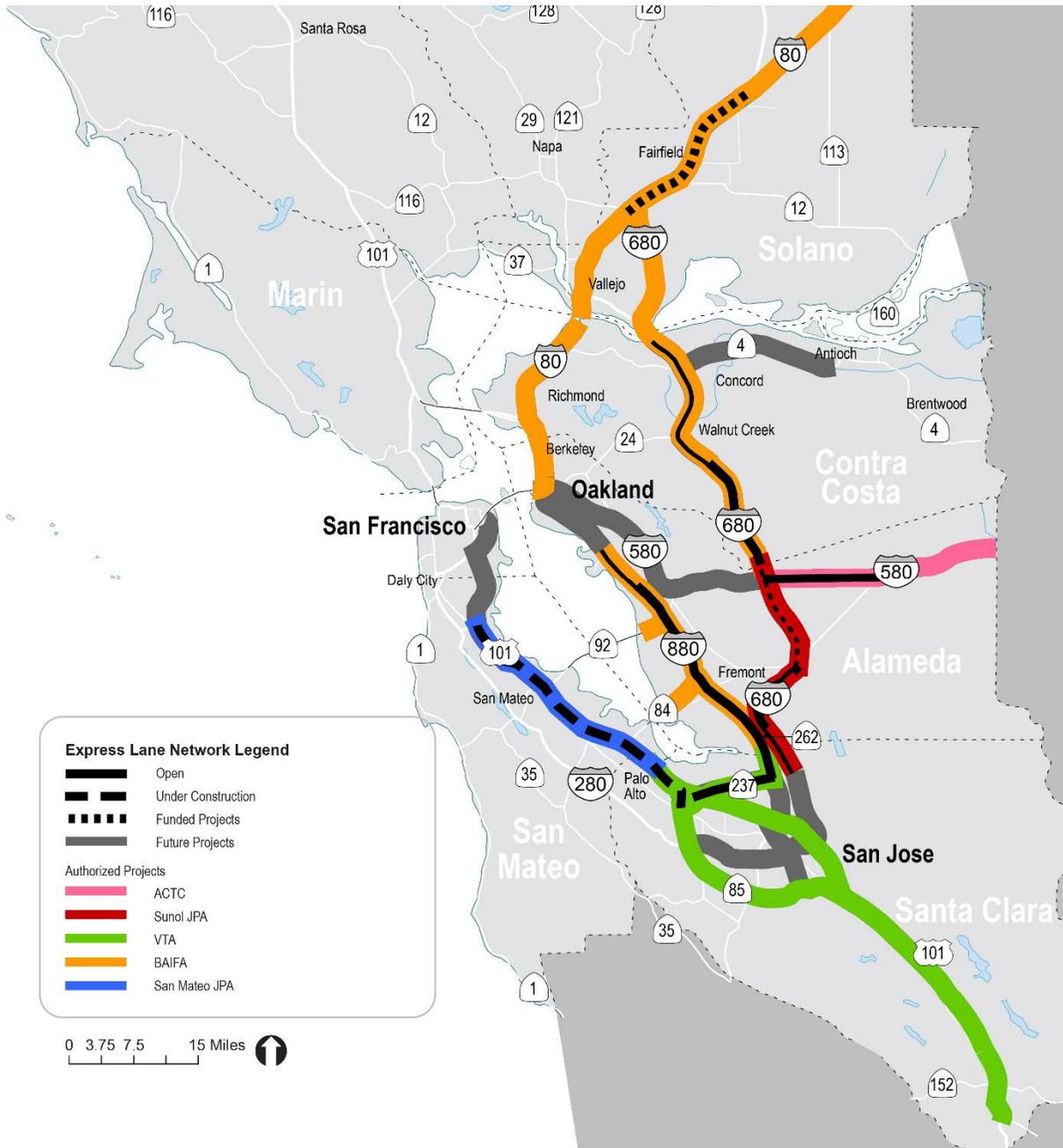


Figure 2: The Express Lanes Network is planned to be built, maintained and operated by many different operators, who must cooperate to deliver a single network to users.

Development of the Strategic Plan began in late 2019, and has been undertaken in two phases (see Figure 3):

- Phase 1, described in Section 2, below, worked to reduce an expansive vision of the Express Lanes Network to a financially constrained network recommendation for inclusion in Plan Bay Area 2050 that included projects that best met strategic goals.
- Phase 2, described in Section 3, Strategy, explored and researched topic areas of regional significance that will inform the buildout and operation of the network. Many of these topics are discussed in detail in expanded white papers, which are included as appendices in Section 5.

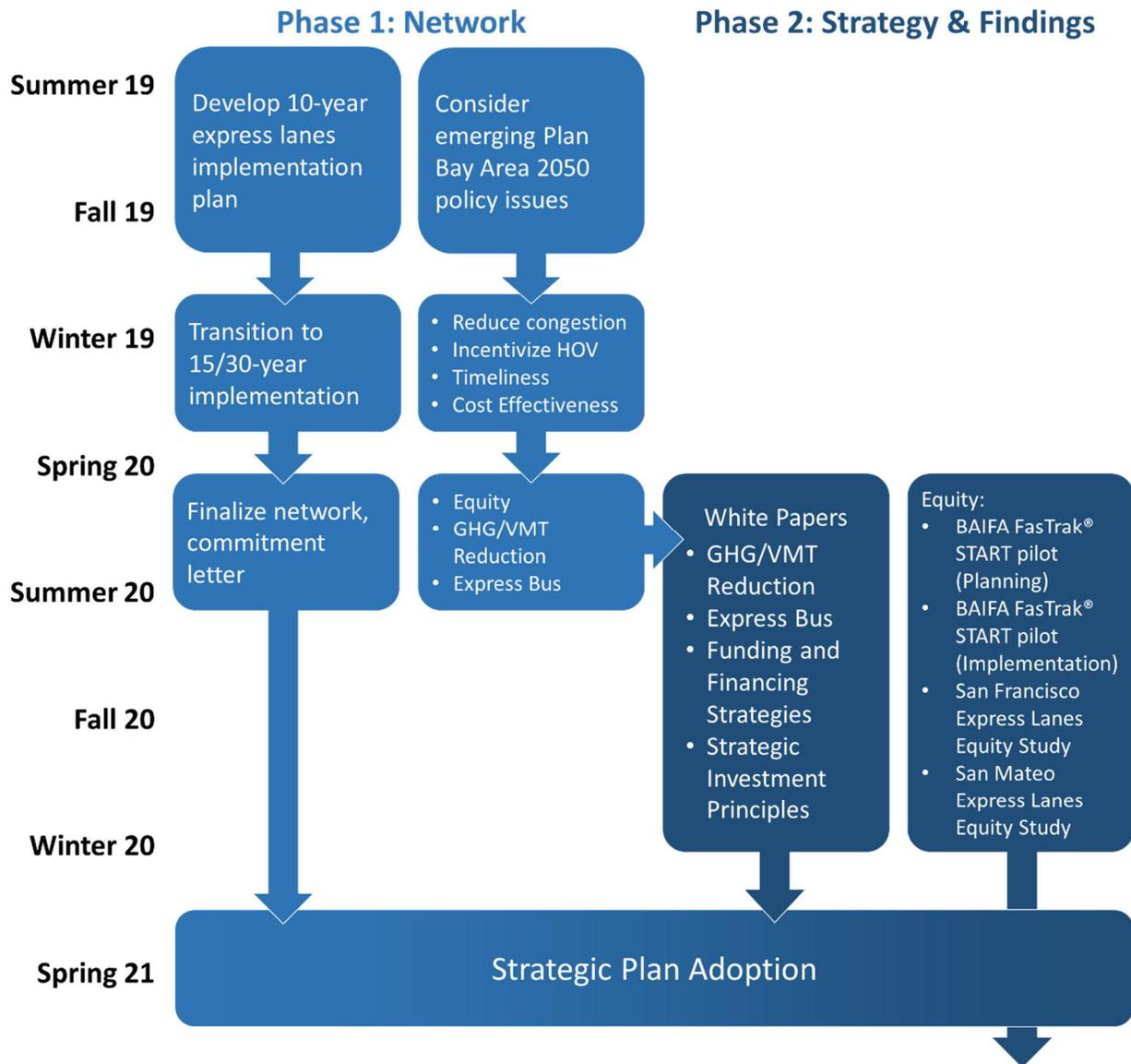


Figure 3: The Strategic Plan is a multi-phase process occurring over two years. Adoption represents the culmination of that process but is also only the start of an ongoing collaboration.

Taken together, these efforts present a comprehensive strategy that seeks to maximize the Express Lanes Network’s ability to achieve its demand management function as well as other important goals for the region. The Strategic Plan provides guidance and principles, based on network and regional goals, to build out the Express Lanes Network. The Plan also provides recommendations on programs, policies, and operations to further support regional goals, presented in Section 4, below: Continuing Work.



2 Network

2.1 Vision

The Bay Area Express Lanes Network is conceived as a robust regional network of dedicated lanes that primarily serve carpools and buses. The network leverages the investment made in the region's HOV lanes by making use of available capacity to move more people, closing gaps in or expanding the managed lane system, and improving operations to provide priority to carpools and buses, thereby expanding their use. The development of the network is a cooperative effort between MTC, several Bay Area County Transportation Authorities (CTAs), Caltrans, and the California Highway Patrol (CHP), with input from other stakeholders who are invested in the success of the network, like equity advocates, carpool/vanpool service providers, and transit operators.

The unconstrained vision for the network was conceptualized as converting all regional HOV lanes, filling in remaining gaps, and expanding to county borders. This vision includes an expansive array of express lanes, shown in Figure 4, with several internal connections and multiple connections along the gateway corridors. This connects the Bay Area to the greater Northern California Megaregion, including the Sacramento area to the northeast, the northern San Joaquin Valley to the east, and the Monterey Bay area to the south.

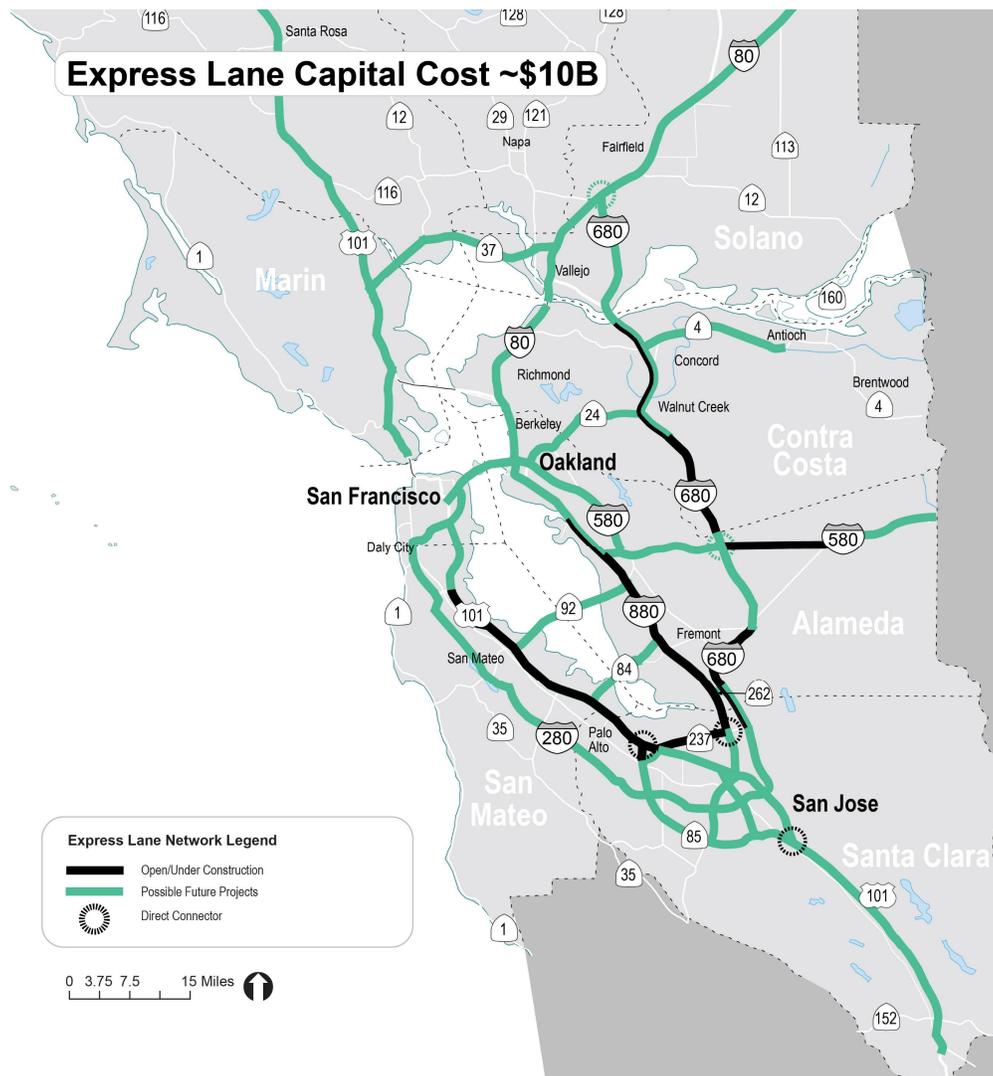


Figure 4: The full Express Lane Network Vision was extensive, but also prohibitively expensive.

2.2 Process to Refine the Network

As the region continues to build out the Express Lanes Network, several parallel regional efforts have been gaining momentum, warranting a renewed scope and vision for the network. These include:

- A commitment to ensuring equitable access to mobility options for all Bay Area residents, with intentional focus on those with the least resources to truly improve access to opportunity;
- An increased attention on utilizing the Express Lanes Network to prioritize regional transit service;
- A strong emphasis on strategies to reduce vehicle-miles traveled (VMT) and greenhouse gas (GHG) emissions; and
- A general desire to increase the cost effectiveness of the network buildout.

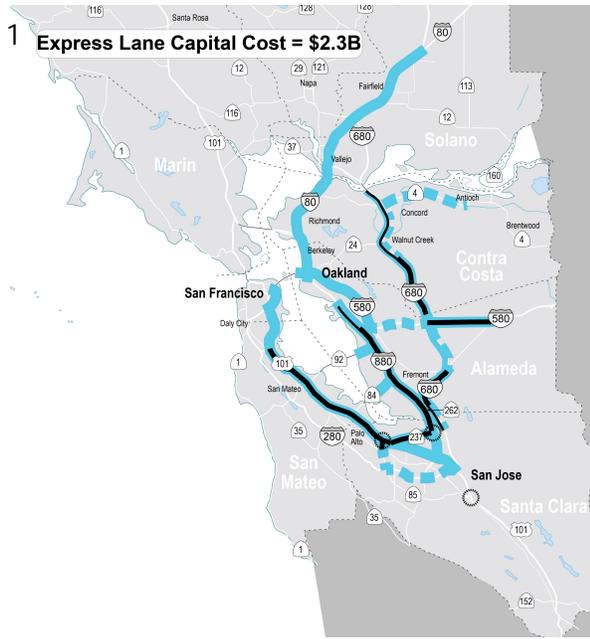
These themes figured prominently in the development of Plan Bay Area 2050. In 2019, a Project Performance Assessment³ revealed opportunities for the network to be more cost effective, equitable, and to be more impactful in achieving the region's GHG reduction goals. In response to these findings, a regional effort was undertaken to reshape the Express Lanes Network. This process included the establishment of a set of overarching program goals that jointly considered the goals of the Express Lanes Network and the regional goals reflected in Plan Bay Area 2050. As a result, six strategic goals (see table below) were developed to help reshape the vision for the Bay Area Express Lanes Network and better align it with regional and state priorities for equity, GHG emissions, and cost effectiveness.

Express Lanes Network Goals
1. Manage congestion and bring reliability to the traveling public
2. Increase person throughput by creating a seamless network that incentivizes the use of transit, vanpools, and carpools
3. Minimize greenhouse gas emissions
4. Focus on equity to improve transportation access and affordability, especially for Communities of Concern
5. Deliver Bay Area Express Lanes Network in a timely manner
6. Be responsible in the use of public funds

The Express Lanes Network goals informed the development of network scenarios that sought to achieve network and regional priorities while also being financially constrained. Four scenarios were developed (see Figure 5), each one emphasizing a particular theme, as follows:

1. Support a successful express bus network and carpool/vanpool programs to improve person throughput;
2. Reduce GHG emissions;
3. Build a seamless and connected network within the region; and
4. Connect to the megaregion.

³ https://mtc.ca.gov/sites/default/files/ProjectPerformance_FinalFindings_Jan2020.pdf



Express lanes that coincided with planned or existing express bus routes pointed to transit synergies that may give the express lanes opportunity to support equity and GHG goals.



Projects that do not add capacity through new lane construction are less likely to contribute to GHG emissions in the long-term. Section 3.2.1, below, describes this concept in more detail.



Planned express lanes that connect lanes that are already in operation or under construction help maximize existing investments and better encourage carpool and transit use by providing more widespread benefits.



Connections to the greater region better integrate the Bay Area network with other planned developments, and increase connectivity to Sacramento and other cities in Northern California, as well as San Joaquin to the East and San Benito to the South.

Figure 5: Four Express Lane Network scenarios each emphasizing a different regional strategic goal.

2.3 Network Recommendation

Ultimately, a network scope was selected for inclusion in Plan Bay Area 2050 that best reflected the express lane goals and regional priorities such as GHG reduction and equity, while also presenting a financially constrained network. This network is shown below in Figure 6.

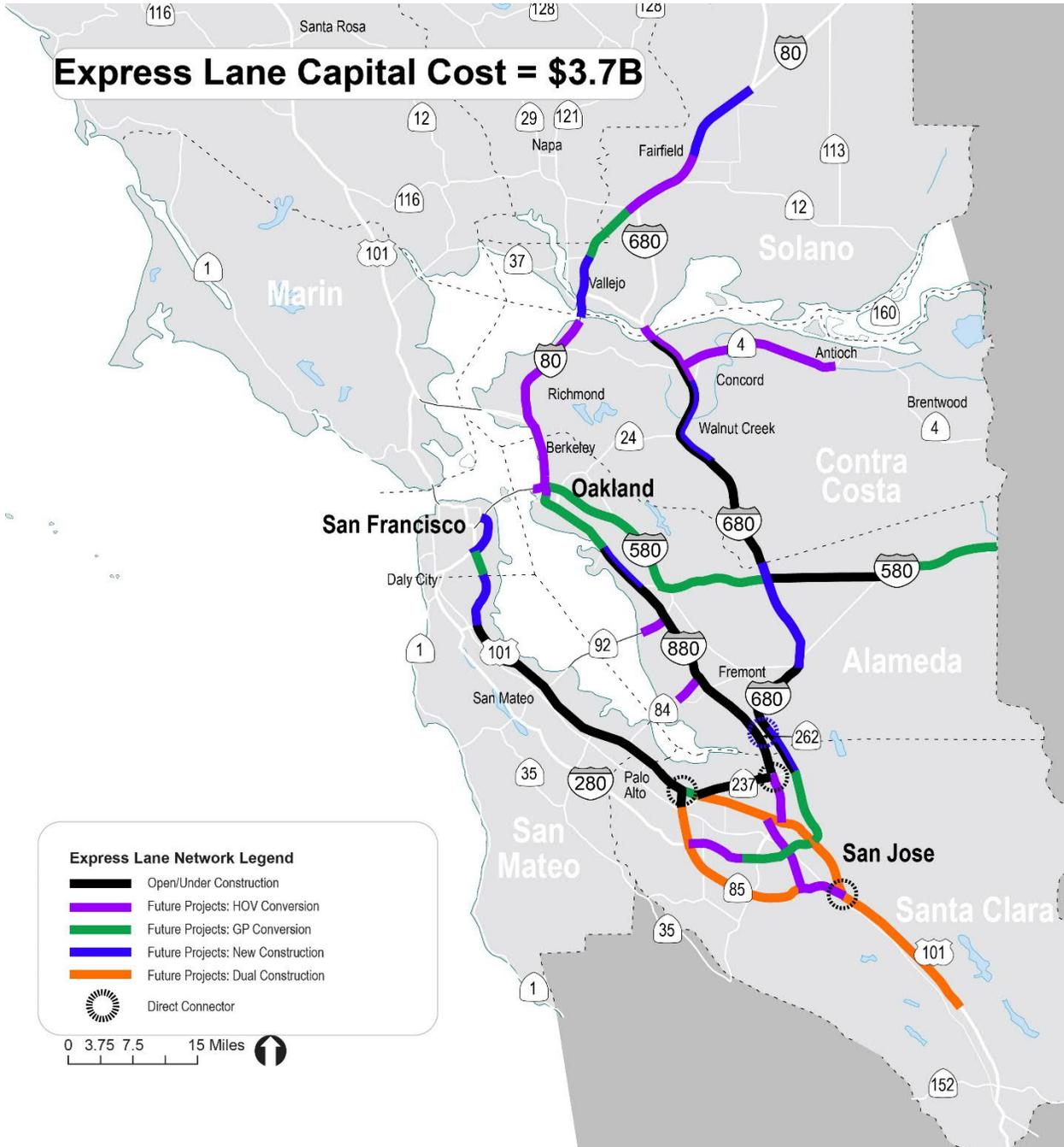


Figure 6: The final network recommendation for Plan Bay Area 2050 reduced the overall cost of the network, while promoting projects which helped achieve other critical goals.

The Express Lanes Network includes the following four project types:

- HOV Conversion: converting an existing HOV lane by adding tolling technology;
- General Purpose Lane Conversion: converting an unmanaged highway lane to an express lane. This is an untested proposal that faces several challenges to implementation, from public perception to existing statute, but is under serious consideration to help reduce GHG emissions and support transit priority and alternatives while completing the network;
- New Lane Construction: building a new express lane on highways where there is no existing HOV lane; or
- Dual Lane Construction: building a new express lane on highways with an existing HOV lane, and converting the HOV lane to an express lane.

As shown in Table 1, below, the resulting system is a network where approximately 60% of lane-miles are planned as conversions, which is an important consideration for GHG reduction. The remaining new construction projects are also important, however, to build out the network and create a consistent travel benefit across the region.

Table 1: Key statistics on the Express Lanes Network recommendation

Project Stage	HOV Conversion		GP Conversion		New Lane		Dual Lane		Total	
	Lane-Miles	Directional Miles	Lane-Miles	Directional Miles	Lane-Miles	Directional Miles	Lane-Miles	Directional Miles	Lane-Miles	Directional Miles
In Tolloed Operation	97	97	0	0	12	12	17	10	126	119
Under Construction	26	26	0	0	40	40	0	0	66	66
Environmental/Design	33	33	17	17	48	48	148	81	246	90
Planning PID or DAA	77	77	17	17	28	28	0	0	122	90
Other	50	50	103	103	7	7	0	0	161	161
Total	284	284	137	137	135	135	165	91	721	615
Cost (\$ millions)	\$ 1,389*		\$ 510		\$ 1,198		\$ 648		\$ 3,746	

*This total includes projects totaling \$845M that have HOV conversion and new lane construction components



3 Strategy

3.1 Context

The process of researching and exploring topics to inform the Strategic Plan began after the recommended scope of the Express Lanes Network was finalized, as described in the previous section. A series of white papers was developed to explore how the network could best achieve the established goals and align with regional priorities. Each white paper topic was discussed at the Express Lanes Technical Advisory Committee, and included:

- VMT/GHG Impacts and Mitigations;
- Express Bus;
- Strategic Investment Principles; and
- Funding and Financing Strategies.

Key takeaways from these white papers are presented in the following sections, along with other topics of regional importance. One of these topics is equity, a critical regional priority that was considered in each white paper and throughout the Strategic Plan. Other topic areas addressed in the following sections include the opportunities and challenges of building an interconnected network, a continuing focus on enforcement, and potential upcoming policies that would have an impact on the network. One topic not addressed in this Plan is express lane design standards which, while critical to the user experience and safety, is governed by State and Federal regulation.

Considering these interrelated topics together is necessary to develop a holistic vision for the Express Lanes Network and to ensure the vision aligns with the greater aims of Plan Bay Area 2050. Many of the individual topics are complex on their own, and that complexity is only magnified through interaction. This leads to considerations that may sometimes be at odds. For example, building a new express lane to connect two existing express lane corridors may be necessary to provide a good travel time benefit for a regional express bus, but without adequately using pricing to manage use by single occupancy vehicles, a new express lane connector also introduces the potential for long-term increases in GHG emissions. These challenging contradictions emphasize the need for flexibility when considering their application across a diverse region, as well as the need for robust mechanisms to maintain communication and collaboration between the Bay Area's express lane operators.

The topics referenced above are organized into the following focus areas:

1. **Achieving Goals:** The operational and programmatic strategies, as well as additional infrastructure investments beyond what are typically considered for baseline express lane functionality, that will help the Express Lanes Network better align with regional goals;
2. **Building the Network:** Moving beyond how we are achieving goals into the practical considerations of how the network is being built and what is important for a healthy functioning network; and
3. **Planning for Change:** Looking further into the future to establish expectations for upcoming disruptive events, policies, and technologies.

These focus areas break down further into individual areas of study. Achieving Goals incorporates GHG/VMT reduction, transit, equity, and strategic investment principles; Building the Network emphasizes the importance of interconnectedness, enforcement, consistent operating policies, and funding and financing; and Planning for Change looks at the potential impacts of the COVID-19 pandemic, additional expected regional and state GHG reduction strategies, and clean air vehicles. These research topics lead into recommendations and future actions, which are outlined by topic in Section 4, Continuing Work.

3.2 Achieving strategic goals and managing demand under continued growth

The six strategic program goals presented in Section 2.2 reflect an emphasis on preserving travel time reliability to promote transit priority, high-occupancy modes, and network alignment with state and regional priorities. This section ties these needs together by focusing on how the future buildout of the Express Lanes Network can help the region achieve state-mandated GHG reduction goals, better serve transit and be more equitable. The section concludes with recommended investment principles to ensure that the region is prioritizing projects that best address these needs for future funding opportunities.

3.2.1 GHG/VMT Reduction

Under Senate Bill 375, the region's long-range transportation plan must demonstrate a 19% per-capita reduction in regional GHG emissions by 2035 when compared to 2005 levels. Furthermore, implementation of more recent legislation (Senate Bill 743, 2013) has led Caltrans to establish VMT as the primary measure of impact for transportation projects during environmental review. The effects of these pieces of legislation require exploration of different project types to continue to build out the Express Lanes Network. When planning an express lane, the decision to convert an existing lane or build a new lane is influenced by the diversity of operational, political, financial, and equity considerations across the Bay Area, as well as the project's effect on GHG emissions.

Lane Conversions

When considering GHG emissions, conversion of existing HOV lanes to express lanes offers the benefit of applying the demand management capabilities of express lanes to existing highway capacity and therefore is not likely increasing VMT in the long term, particularly in comparison to projects that add capacity which may induce travel demand. HOV-to-express lane conversion projects also have the advantage of being able to build off an already established carpool and transit base. This can provide benefits to vehicle- and person-throughput in a less expensive and faster manner compared to new lane construction, assuming the lane is priced to avoid overuse by Single-Occupancy Vehicles (SOV), and HOV usage is maintained at a similar level to that prior to conversion.

Another conversion strategy currently under consideration in the region is the conversion of general purpose lanes to express lanes, a strategy that has the potential to prevent long-term increases to GHG emissions, according to the California Governor's Office of Planning and Research.⁴ At present, this is a proposed concept that will require leadership at the local and state level, as well as clarification at both the federal and state level to pilot. Converting lanes that are already congested may increase GHG in the short-term if it results in cars sitting in traffic for longer periods, though this may be combatted by increasing the availability of effective carpool and transit services. Conversions of general purpose lanes to express lanes also raise political, operational, and public perception challenges that need to be addressed to ensure that these projects are viable and that they maintain or decrease congestion to a point where they avoid counterproductive increases to GHG emissions. However challenging, general purpose lane conversions are important to consider, and studies are needed for each proposed conversion project to ensure its viability as an alternative to new lane construction. New lane construction presents many of its own sometimes contradictory effects on achieving network and strategic goals.

⁴ https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

New Construction

New lane construction in the Bay Area Express Lanes Network is proposed in many cases to close or reduce gaps that currently exist in the HOV lane network or to improve the capacity of an existing HOV facility by adding a new second lane. In some cases, these new lanes are being sought to bring relief to corridors that suffer from recurrent congestion that spills onto local arterial networks during peak periods. Although these strategies can bring operational benefits by serving demand that already exists in a corridor, they have also been shown to contribute to increases in VMT/GHG by creating new demand for the corridor. New lane construction may relieve general purpose lane congestion temporarily and provide short-term relief, possibly even reducing GHG in the short-term by allowing cars to run at more efficient speeds. However, numerous studies have shown that short-term beneficial effects can be overtaken and reversed as general purpose lane capacity is filled up by induced demand.

Induced demand is the concept that expanding road capacity generates new traffic. The extra capacity introduced can serve to encourage more people to drive, either in the form of encouraging existing users to make new, more frequent, or longer trips; shift modes; or by drawing new users to the facility. This has the effect of reversing any short-term congestion relief impacts over time as new trips and longer trips can return the corridor to a congested state. Another type of demand that can result in increased VMT when new capacity is added is latent demand, which is demand that exists to use a facility but is suppressed by the inability of the facility to handle it. Latent demand may manifest in the form of mode shifts or changes in trip route after new capacity is added, further contributing to increased usage of new capacity. Beyond this initial period, longer-term impacts include shifts in land use and increases in car ownership that can also cause increased demand. It is important to note that while adding managed capacity may not create as much induced demand in the long-term as an added general purpose lane, the express lane business model still relies upon filling at least some capacity with single-occupant drivers. Even this reduced capacity increase is likely to induce demand.

Dual lane projects involve converting existing single-lane HOV facilities and adding a second lane to the facility to improve safety and operations, increase capacity, and/or enhance priority for buses and other HOVs. Like HOV conversion projects, these projects build on an existing HOV and transit user base, but because they also add capacity, the concept of induced demand may still factor into these projects. While this concept would add some capacity, it warrants consideration because it also serves to further enhance the performance of express lane systems. In concept, dual lane projects may also convert an existing HOV lane and convert a general purpose lane, a concept likely to be studied for I-80 in Alameda and Contra Costa counties. This would reduce the expense of new construction and reduce the GHG/VMT impacts of widening, but under this strategy the practical challenges and legal context issues described previously for general purpose lane conversions would also need to be considered.

Building one or two lanes of new capacity may increase VMT to a point that requires mitigation under changes to the California Environmental Quality Act (CEQA) guidance in response to Senate Bill 743 (SB-743).⁵ The new capacity may be warranted if it serves to close critical gaps and improve operations. This important topic is further explored in Section 3.4.2.

⁵ Please note: the paper will refer to VMT analysis/mitigation as a requirement of SB-743 for simplicity, however it is actually the CEQA guidelines revised by the Governor's Office of Planning and Research in response to SB-743 that name VMT as a measure to be used to determine impacts. Please see Section 3.4.2.1, below, for more details.

3.2.2 How to Better Serve Transit

In addition to incentivizing carpools, the Express Lanes Network also has many potential benefits for transit, especially by offering a priority, congestion-free guideway for express bus service. A typical express bus service route has a single origin stop or cluster of stops, followed by a long travel segment, ending in a single destination stop or cluster of stops. Like regional express buses, employee shuttle buses would similarly stand to benefit from access to a complete Express Lanes Network.

The Bay Area is currently served by several express bus routes that make multi-county connections and/or provide connectivity to other major transit services like BART, operated by diverse providers including Golden Gate Transit, AC Transit, WestCAT, SamTrans, Soltrans and FAST. However, the concept of regional express bus is still gaining momentum in the Bay Area as roadway congestion, the cost of rail transit infrastructure, and crowding on existing transit services like BART have continued to increase.

MTC asked regional express lane and express bus operators what makes express lanes work best for express bus services. This feedback highlighted the need to involve transit planners and operators as early as possible in express lane design to help identify opportunities to support the needs of transit. An effective express transit service must provide fast travel times, frequent service, and reliable operations to attract riders. The express lanes can and do provide reliable travel conditions, but these benefits must be easily accessible to buses.

Current express lane designs, as well as the lack of direct connectors between express lane facilities, do not necessarily afford express buses effective use of the lanes, hampering the efficacy of both the express lanes and express buses. For buses to gain the significant benefits from express lanes, they must first merge across several lanes of frequently congested traffic to gain access. These weaving and merging challenges often lead to travel time inconsistency, delays, and anxiety for bus operators.

Express bus service that focuses on serving commuters during peak hours would benefit from improved access between express lanes and walk-up stops/stations or park-and-ride facilities. This could be accomplished through construction of direct-access ramps or transit signal priority improvements on connecting local streets. However, the existing limited availability of off-peak service neglects transit users who make trips outside of commute purposes or hours. Future express bus service might focus more on supporting equity by accommodating riders who make trips for all purposes and at off-peak times. This requires offering an affordable and reliable service, along with investments to ensure that the service is accessible to all.

No matter the type of bus service, major infrastructure improvements such as those noted above are expensive. A sufficient benefit would need to be projected to counter the significant cost of major capital improvements like dedicated access ramps. Since there are diverse transit needs across the region, it is unlikely that the same improvements will make sense for every express lane project. Express lane and express bus operators should continue to advocate for increased connectivity and collaboration across the region.

It is also important to acknowledge that this Strategic Plan does not cover operational considerations for transit since these are outside the scope of the Express Lanes Network. However, the challenge of operations is critical to the execution of any transit service. While express lane operators support transit services and priority in their express lanes, it is important to acknowledge that net toll revenue must first be used for express lanes network operations, maintenance, and rehabilitation before any financial support can be used for transit operations. Each express lane operator will define a net toll revenue

policy and will consider if and how transit services and priority can be funded. There will be a challenge to find ongoing express bus operational funds.

In consideration of all these points, express bus service and associated infrastructure improvements are not appropriate for all express lane projects. Corridor partners are best equipped to determine if the strategy performs well and is a good fit. However, even if express bus improvements are not the best solution for every corridor, projects may be able to support other local or regional transit services by investing excess net toll revenue, if available, in other ways that support transit improvements. In addition to supporting local transit, Transportation Demand Management (TDM) strategies that provide information and incentives to help people better understand and access transit, ridesharing and active transportation, is critical here. Subject to statutory requirements and availability, supporting transit operations using net toll revenue is a good way for express lanes to have a positive impact on transit in general, even if express bus is not supported.

3.2.3 Equity

MTC's Equity Platform, launched in 2019, envisions a "just and inclusive Bay Area where everyone can participate, prosper, and reach their full potential." MTC pursues its equity agenda with a racial justice focus by investing resources for historically underserved groups including low-income and communities of color at a scale to meaningfully reverse the disparities in access that diminish our region. If a highway project benefits higher-income car owners, and exposes lower income communities to increased auto exhaust, it is inequitable on two counts. The importance of considering equity as a cross-cutting issue is codified in Plan Bay Area 2050, in which express lane partners have been tasked with aligning Express Lane Network goals with five guiding principles, emphasizing affordability, connectedness, diversity, health and community vibrancy.⁶

Equity at MTC is approached multi-dimensionally, to frame intentional actions to reform systems of injustice and exclusion that persist today. The Equity Platform is structured around four pillars: (1) Define and Measure, (2) Listen and Learn, (3) Focus and Deliver, and (4) Train and Grow. The descriptions below are provided as illustrations of what could be accomplished by applying the pillars to the Express Lanes Strategic Plan:

1. Define and Measure: Data-driven framework to develop equity success metrics for not only what we do relative to Express Lanes, but also how we perform our work, both internal and external assessments and evaluations;
2. Listen and Learn: Develop modern, robust public engagement practices that include a diverse range of voices, with emphasis on those that have remained on the margins of decision-making in the past;
3. Focus and Deliver: Identify where MTC leads and has direct responsibility; and where MTC should partner on matters that are local or beyond core transportation responsibilities, and;
4. Train and Grow: Build upon capabilities advancing equity in Express Lanes within the transportation sector and across sectors.

Express lane partners are currently in a development phase to determine how these broad, cross-cutting equity concepts can best be practically applied to the express lanes. MTC is currently developing a pilot to test the concept of means-based tolling on its I-880 Express Lanes in Alameda County called FasTrak[®] START. Similar to the Clipper START model for means-based transit discounts,⁷ this concept would

⁶ <https://www.planbayarea.org/about/plan-bay-area-2050-vision>

⁷ <https://www.clipperstartcard.com/s/>

provide a toll discount to users who earn income below 200 percent of the federal poverty threshold. The pilot aims to use effective public outreach and make tolls more affordable for low-income earners, increasing opportunity for those who have been unable to use the express lane in the past, while ensuring express lane performance for all users. MTC is also pursuing the goal of linking Clipper START and FasTrak® START by coupling enrollment to both. This would be a major step toward an integrated, multi-modal regional mobility account that merges transportation services for the customer.

The counties of San Francisco and San Mateo are also undertaking more general equity studies that seek to explore different local approaches to addressing equity with express lanes. In San Francisco County, county authorities are conducting an equity study of the US-101/I-280 corridor by working with the local community to prioritize concepts that advance equitable access, promote reliable travel in the corridor, and minimize potential impacts to adjacent neighborhoods. These concepts may include potential investments on the freeway and freeway access points, re-routing or transit service expansion, affordability and incentive programs, and local street safety and active transportation. In San Mateo County, the results of the equity study will be used to establish an equity program for the US-101 express lanes. MTC and partners are working together on these efforts in the pursuit of identifying equity strategies which are implementable both at the regional and local levels.

Below is a list of additional equity initiatives that could inform express lane policy and implementation by regional partners. These local and national examples demonstrate the intersectionalities between express lanes and: access and affordability, investments, climate strategies, engagement, and congestion management. Selected examples are described in the subsequent sections.

Access and Affordability

Access to Transit	MTC Clipper START means-based transit discount pilot
	BART Station Access Guidelines
	BART University Pass/Discount
	LA Metro – Transit-Oriented Communities
	San Francisco’s Late Night Transportation Study
	San Francisco Prosperity Plan
	Treasure Island Transportation Affordability Program
Right of Way Management and Investment	SF Transit-First Policy
Toll Enforcement	BATA Toll Violation Policy Review

Investments

Investment in underserved/underrepresented communities	MTC’s Lifeline Transportation Program
	MetroTransit’s Equity Approach for Transit Shelters
Value-based Prioritization	Oakland DOT Goal-Aligned Budget Process
	Participatory Budgeting
Services, capital investment, rider programs that meet broader travel needs	LA’s Measure M Transportation Funding Ordinance

Climate Strategies

Partnerships to support dense, transit supportive development	California’s SB-375 Targets
	Clean Vehicle Initiative
	OneBayArea Grant Program
	MTC Transit-Oriented Development Plan

Engagement

Shared Decision-Making and Co-Creation	MTC Blue Ribbon Transit Recovery Task Force – Equity Principles
	LA Metro Equity Platform
	King County: Mobility Equity Framework

Congestion Management

Toll Equity Programs	San Mateo 101 Express Lanes Study
	VTA Study: Approaches to Vulnerable Populations When Requiring All Customers to Carry a Toll Tag
	US 101 Mobility Action Plan
	I-110 and I-10 Low-Income Assistance Plan

The following sections summarize how equity has been considered in other Strategic Plan topics.

3.2.3.1 Equity in GHG Strategies

Like the varying GHG impacts noted for different project types described in Section 3.2.1, above, different project types also have varying expected equity impacts. For example, if a general purpose lane conversion resulted in increased congestion, it could raise significant equity concerns since this would more consistently impact highway users with less ability to pay for express lane access, unless mitigated. Similarly, any strategies to incentivize mode shift to high-occupancy modes that accompany potential general purpose lane conversions must be accessible to Communities of Concern, particularly those community members who depend on auto travel in the corridor.

New lane construction also has important equity considerations due to VMT mitigation, described in more detail in Section 3.4.2, below. Two main VMT mitigation strategies, VMT mitigation exchanges and banks, could potentially allow VMT mitigation strategies to be implemented at a significant distance or period of time away from the impact. Whenever impacts and mitigations are separated, either in space or time, the possibility of benefiting or causing adverse impacts to one population over another is introduced. The VMT mitigation strategies listed in Sections 3.2.1 and 3.4.2 should be evaluated for impacts to equity in the region and opportunities to improve it. To combat potential inequity in the distribution of resources, there are some steps that can be taken to regulate the distribution of funds:

- A percentage of total mitigation funds can be earmarked for Communities of Concern, with funded programs determined through meaningful community outreach and participation;
- Priority can be given to mitigations that benefit Communities of Concern;
- VMT mitigations with co-benefits to Communities of Concern, such as investment in transit services, can be focused on communities who need them; and
- Strategies that apply mitigations at the place or time of impact can be prioritized.

3.2.3.2 Equity in Transit Strategies

An Express Lanes Network that facilitates affordable, accessible, and reliable transit options can help address equity. For example, an express lane that improves accessibility and reliability for a bus service that serves Communities of Concern could be one way to mitigate equity concerns associated with the express lanes. Express lanes have the potential to accommodate transit services via targeted infrastructure investments that improve transit priority and travel time reliability or by investing net revenue in transit services. To ensure priority, investments in transit service may need to focus more on:

- Supporting multi-purpose trips throughout the day;
- Commuting during off-peak hours;

- Route planning that considers the specific needs of target communities, such as whether a bus line routed through a community serves its most needed destinations;
- Evaluating routes and their related infrastructure investments on potential changes to employment accessibility, education, and housing opportunities;
- Building infrastructure like direct access ramps that provide significant benefits where Communities of Concern are located;
- Investing in multimodal access to stations and park-and-rides;
- Exploring possible synergies between the means-based transit fare discount program (Clipper START) and future means-based toll discount programs (FasTrak® START), depending on pilot results, including linked enrollment; and
- Ensuring equity benefits are available at the outset of express lane service to ensure access to travel alternatives.

3.2.3.3 Equity in Strategic Investment Principles

There are a variety of opportunities to further integrate equity into the express lanes, from implementing reduced toll programs for low-income users, to multi-modal integration, to discount and incentive programs for using non-auto modes, to funding projects with net toll revenue. As discussed in Section 3.2.4, this idea is reinforced by making equity a key principle when MTC has a role in funding recommendations. This investment principle favors express lane project sponsors who take advantage of opportunities to benefit (and not negatively impact) Communities of Concern, encourage participation in planning, and support equity programs on a regional or local level, depending on what is appropriate.

3.2.3.4 Equity in Tolling

As described in Section 3.3.2, police traffic enforcement is a critical aspect to ensuring that the travel time and reliability benefits of the express lanes go to its intended user base of HOV and transit users, as well as SOV drivers who pay a toll to use remaining capacity. At the same time, the United States is currently undertaking an important public discourse on racially disparate policing and criminal justice practices. MTC Resolution 4435 condemns systemic and structural racism and reaffirms the agency's commitment to a more equitable, inclusive Bay Area. MTC acknowledges its commitment to advancing equity as a mindset reflected in intentional and ongoing process, actions, and outcomes. The breadth and depth of discussion and change necessary to deliberate the challenge of traffic enforcement in general involves a collective response just touched upon in the scope of this Strategic Plan. Within MTC's scope and authority, we focus here on balancing tolling and its policies and procedures with equity and social justice.

Bay Area Toll Authority (BATA) staff are beginning the work to modernize FasTrak® tolling policies and procedures with an effective equity lens. The goal is to create a fair and just system that ensures access to transportation options and eases the toll payment process, while acknowledging and addressing barriers that affordability and enforcement can present. The policy updates will require a holistic approach that considers many aspects of customers interacting with the system. Staff will conduct a comprehensive review of current FasTrak® policies – from becoming a FasTrak customer (e.g., tag deposit, initial balance requirement, etc.), to keeping an account in good standing (e.g., grace periods and account balance notifications, more/easier ways to load value to your account, etc.), to enforcement and violations (e.g., violation penalties, administrative review procedures, etc.). Enforcement and violations have additional considerations as penalty fees may also generate additional burdens if unpaid fees result in high fines or the inability to renew vehicle registration.

Especially considering the intended rollout of the FasTrak® START pilot on BAIFA's I-880 Express Lane, BATA is assessing which policies and procedures can be changed in the short term so that new START users can benefit from them while BATA researches, outreaches, and completes updates to more complicated policies.

3.2.3.5 Equity in Consistent Operating Policies

Equity strategies require nuanced consideration when coming to a regional consensus on what level of consistency is needed.

Equity programs that rely upon the backend FasTrak® account management system, such as any program that provides discounts or credits for the use of the toll lane, will likely need to be regionally implemented since this mandatory shared technical resource relies on consistent business rules. MTC's current means-based tolling pilot is such a program, so the results of the pilot will need to be considered within a regional consistency evaluation process, to be determined (see Sections 3.3.3 and 4.2.2). Additionally, users need to have a predictable application of adopted policies since differences in fee-based options could create confusion among the public user base. Therefore, among all options for equity programs, toll discount programs are the most likely to require strict consistency.

Other equity programs that do not rely on toll discounts are likely more flexible in their need for consistency, and furthermore may rely on reacting to very specific local needs and conditions. For example, using net toll revenue collected on the corridor to fund multi-modal integration is not only likely to work better under corridor-based rather than regional application, but also may rely on the modes that target populations already use, local housing density, population needs, car ownership rates, and many other characteristics to ensure its success. Furthermore, by statute, net revenue can be spent only on improvements in the corridor from which it was generated.

While the success of many equity programs relies on responding to local needs and therefore may not need full regional consistency, they may still benefit from consistency at a sub-regional level. For example, investing in transit for a local population along a certain corridor may be more beneficial if similar transit investments were made along the entire corridor, even if express lane segments were operated by different entities. For this reason, it may be advisable that any equity program be evaluated for sub-regional consistency when any operator seeks to make an equity investment and connects within a corridor.

3.2.4 Strategic Investment Principles

Strategic Investment Principles describe a set of guiding principles that capture the collective goals of the Bay Area Express Lanes to help the region make decisions as funding becomes available. MTC often has a role in programming funding available to Bay Area express lane operators from certain regional, state and federal sources, including:

- Compiling project nominations,
- Nominating projects, and
- Programming funds.

These funds are typically limited and restricted in the kinds of uses for which they may be awarded, so MTC identifies eligible projects through a grant application and approval process. MTC is also often called upon to give input on or endorse projects seeking funds from other entities.

Strategic investment principles are a way for MTC to incentivize projects that have applied for funding to ensure (1) they achieve the goals required by the grant and (2) they meet other important regional goals. For example, if a grant becomes available for projects that reduce congestion, a strategic investment principle would encourage funding applicants to ensure their project reduces congestion in a way aligns with regional strategic goals in addition to meeting the grant criteria.

Furthermore, investment principles ensure that all aspects of performance with regards to achieving strategic goals are considered when prioritizing projects, even if a specific funding source does not have such broad requirements. For example, if a limited grant becomes available to reduce congestion, and two projects demonstrate congestion reduction benefits, evaluating projects holistically may help prioritize a project that also achieves a regional strategic goal of focusing on equity. For this reason, this plan establishes a set of standing strategic investment principles that may not only be applicable to specific funding sources, but also provides general guidance on how other benefits should be considered during project evaluation.

At the same time, strategic investment principles are living guidelines that should be able to adapt to different conditions. Funding programs may have specific requirements and goals set by state or federal funding agencies, or MTC may have existing policies in place for specific funding programs which should not be superseded by new or revised principles. At the same time, we can expect that the policy landscape may change over the course of the decades-long timeline of long-term planning. As such, the principles outlined below will need to be integrated and adapted to identify projects well matched to each funding source. There may be diverse opportunities for express lanes projects with different characteristics to be competitive for funding, when available.

It is important to emphasize that express lane projects are complicated to consider because they are both individual projects and part of a broader project – the full network. We attempt to consider the duality here by emphasizing under each investment principle that each project may have a way to contribute to a strategic goal individually or agree to participate in a regional effort. For example, for a GHG/VMT reduction goal, a project may not feasibly be able to convert an existing lane rather than build new capacity, but may be able to participate in a regional effort like helping to connect and support a regional transit service.

The strategic investment principles framework in Figure 7, below, can incentivize projects to align with regional goals and to include local or other funding sources as part of its funding application. This framework organizes principles into two groups: project merit and project readiness. As future funding

sources become available where MTC has a role in selecting projects for funding, MTC would use this framework to advance projects that perform well against regional goals. A key motivation of producing this framework is to more strongly emphasize the importance of a variety of project merits in considering project eligibility for funding. However, project readiness, from completed environmental analysis to a project being fully funded through local or other sources outside of the current request, will continue to be considered in various contexts. In this regard, the structure of the framework allows enough flexibility to change emphasis depending upon the requirements of specific funding sources. To this end, MTC would be helping partners advance Plan Bay Area 2050's vision for the Bay Area.

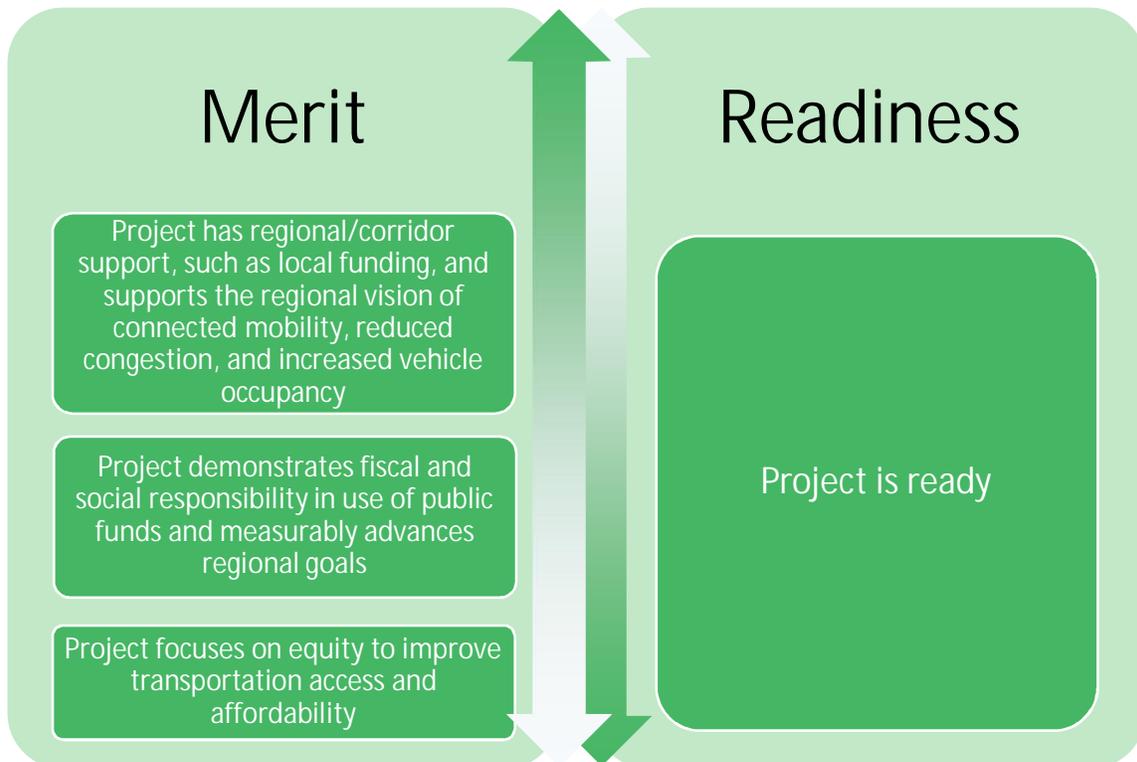


Figure 7: The strategic investment principles framework allows merit-based principles to be more strongly emphasized, while maintaining flexibility if certain funding sources prioritize readiness

3.3 Considerations for the buildout and operation of the network

Beyond working to achieve strategic program goals, the Express Lanes Network must also work through the practicalities of continued buildout and operation. This section focuses on considerations associated with building an interconnected network across jurisdictional boundaries in a way that operates seamlessly from a user perspective. Effective and efficient enforcement strategies are also addressed, as this is essential to the ability of the express lanes to maintain travel time benefits. Distinct from the concept of physical interconnectedness, we also explore the concept of consistency in operating policies across different projects and operators. Finally, future prospects to fund and finance the buildout of the network are explored.

3.3.1 Interconnectedness

A complete and well-connected Express Lanes Network is critical to provide a significant travel time benefit on trips from a variety of origins to a variety of destinations. Besides providing a benefit over a greater portion of a trip, a complete network is also critical to avoid travel time increases that often

result where express lanes end and transition to other lane types. The priority afforded to carpools, buses and transit provide travel time savings and reliability, which are perhaps the most important motivators for users to switch to these high-occupancy modes. The ability of the network to help the region achieve GHG reduction goals, support transit by improving service and reducing operating costs, and be more equitable are therefore dependent on a connected network. Planning for express lane projects that will extend or connect existing facilities, particularly for projects that will connect across jurisdictional boundaries, will undoubtedly become more complicated and require new considerations. Creating more connections between facilities further highlights the need for consistency and introduces new operational challenges.

The planning for projects that connect express lane facilities together will need to consider impacts on adjoining facilities. These include:

- Impacts and opportunities for transit – Closing gaps in the network and forming connections between express lane projects introduces opportunities for new or enhanced transit service. This reinforces the need for express lane planning efforts to include participation from transit providers;
- Upstream and downstream operational impacts – Traffic impacts on upstream and downstream facilities will need to be assessed. For example, a project that is expected to create additional demand for a downstream facility may necessitate pricing algorithm changes on the downstream facility to maintain operating conditions. Similarly, a project that is expected to relieve a bottleneck may also warrant pricing changes for a facility that is upstream of the bottleneck;
- Connections to the megaregion – Monitoring the status and potential impacts of express lane projects that are connecting into the Bay Area from the Northern California megaregion, including coordination with plans from connecting regions like Sacramento and San Joaquin;
- Access considerations – Traffic analysis may reveal a need for changes in lane access configurations or access restrictions when facilities are extended or connected. Such changes would have impacts on existing sign and toll system infrastructure for any impacted facilities, as well as any existing or planned express bus routes that need express lane access;
- Toll segment boundaries – Extending or connecting to a facility introduces an opportunity to assess the boundaries of toll segments. For example, instead of a toll segment terminating at a county line, it may be more appropriate to terminate at the nearest major destination; and
- Coordinated management and data-sharing between operators are also important to the healthy functioning of a truly interconnected network. It will be important to monitor, as the network grows and starts to connect, the extent to which data-sharing agreements are needed and how often data should be shared.

As the Express Lanes Network becomes more connected, the region will need to work together and seek opportunities to ensure that the network not only operates as a holistic system, but also interfaces efficiently with other connected transportation systems. The Blue Ribbon Transit Recovery Task Force, for example, is considering the idea of centralized transit network management to provide a better, more consistent experience for users of the Bay Area's numerous transit systems. This discussion highlights the importance of continued emphasis on consistent operating policies by express lane operators in order to efficiently coordinate with transit network management and provide a seamless network for express bus services.

3.3.2 Enforcement

While the concept of interconnectedness emphasizes the importance of creating a significant travel time benefit across the network, users who break the rules by violating operating policies reduce these benefits for others. This section focuses primarily on enforcement of carpool occupancy requirements; however, other important aspects of enforcement include: application of toll violation penalties and procedures, particularly as related to equity; and the ability to enforce safe usage of the lane through design such as lane separation.

The effects of not effectively enforcing cheating may include poor lane performance (i.e., lower time savings for buses and carpools); higher tolls for legitimate paying customers; further encouragement of cheating; reduced revenue for operations and maintenance costs; reduced public trust in the express lane concept; and increased weaving and merging if violators change lanes to avoid toll readers. Cheating on the Express Lanes Network occurs primarily in two ways: misrepresenting occupancy and using the express lanes without a toll account.

Occupancy declaration depends primarily on driver honesty and is enforced by CHP. Toll violations (i.e., using the express lanes without a FasTrak® account) are enforced by the toll system. In express lanes, drivers use a FasTrak Flex® toll tag to signal to the express lane toll system the number of people in the car. The toll system then applies the appropriate toll discount, depending on tolling rules for each facility, which are now regionally consistent. Vehicles that self-declare their HOV status trigger beacons at key points along the express lane. If a CHP officer witnesses a vehicle which has declared high-occupancy but does not have the required number of riders, they may issue an HOV occupancy citation or warning to the driver.

From a practical perspective, occupancy enforcement is difficult to perform. Visual confirmation of violations is necessary, but subject to all the difficulties of seeing into a fast-moving vehicle. After visual confirmation, it may be unsafe or time-consuming to attempt to pull over a car in a single express lane, further complicated by its location on the left of the highway. This leads to a limited number of citations per hour, which contributes to degradation of service in the express lane. In 2015, MTC conducted a study and found that occupancy violation rates in HOV lanes were as high as 39% and, on average, close to 25% in the AM period, system-wide. As a result of these findings, the region is prioritizing efforts to improve enforcement of occupancy requirements in HOV and express lanes through use of technology as described in the following sections.

Using the express lanes without a toll account also lowers revenues due to the increased costs to process transactions. Vehicles that travel in the express lanes without a FasTrak® transponder are automatically detected by license plate cameras, which can then be matched to a FasTrak® account for tolling. If no account exists, FasTrak® will process a toll violation according to procedures established by the BATA.⁸ These policies can result in the issuance of toll violation notices that include associated penalty fees. As discussed in Section 3.2.3.4, equity questions have been raised about the toll violation and penalty process and how it may disadvantage low-income travelers, particularly if it results in high fines or inability to renew vehicle registration. BATA is currently reviewing these procedures with an eye toward equity and opportunities to reduce the burden on low-income drivers. Express lane agencies

⁸ Bay Area express lane operators have adopted toll ordinances with violation policies that are consistent with those adopted by BATA. This allows for consistent violation processing by the FasTrak® Regional Customer Service Center.

have thus far consistently followed BATA policies, but if BATA recommends any changes, each agency will need to evaluate and adopt them.

3.3.2.1 Vehicle Occupancy Detection

Camera-based detection services use image processing software to attempt to calculate occupancy by counting passengers within vehicles and are currently being piloted by MTC. It has not been determined how such a strategy would impact current CHP practices, and details of such an arrangement would benefit from the support of CHP and all express lane operators. For example, camera-based occupancy detection could be used to send out toll invoices with warnings or notices to violators as a behavioral deterrent. While such a strategy may lack significant legal consequences for violators, it may serve to discourage unwanted behaviors by alerting violators to the fact that their behavior was observed and therefore able to be identified for possible future enforcement action. The effectiveness of this strategy in achieving enforcement goals must be compared against the investment level required to install equipment across a sufficient geography, set up backend services, including possible image review, and operate. However, a portion of the investment could be offset by recovering lost toll revenues from violators. Even so, this type of service may have merit as a targeted strategy in areas where there is particularly high congestion or violation rates.



Figure 8: Example VOD equipment

Using camera-based solutions for automated enforcement would benefit from input from CHP and state authorities. It also requires testing for accuracy and effectiveness, as well as an extensive consensus-building, public messaging, and implementation process, particularly addressing privacy concerns. This may make implementation of automated enforcement strategies burdensome, but consideration may still be warranted if widespread lane degradation has been proven or is expected to be particularly bad.

3.3.2.2 App-Based Services

Another technology-based solution that could improve compliance with express lane occupancy requirements is the use of smartphone apps. MTC will pilot a smartphone app-based service to verify the number of occupants in a vehicle. In general, at least one person in the carpool needs to have a smartphone with the app installed. This app verifies vehicle occupancy in one of two ways. It may pair and count individual smartphones in the vehicle, verifying vehicle occupancy. It may also use the phone's camera and facial image technology to detect unique faces in the vehicle, allowing a person without a smartphone to participate in the carpool and facilitating end-of-trip validations. Apps have the potential to provide a much more accurate occupancy count than self-declaration methods like switchable FasTrak® transponders.

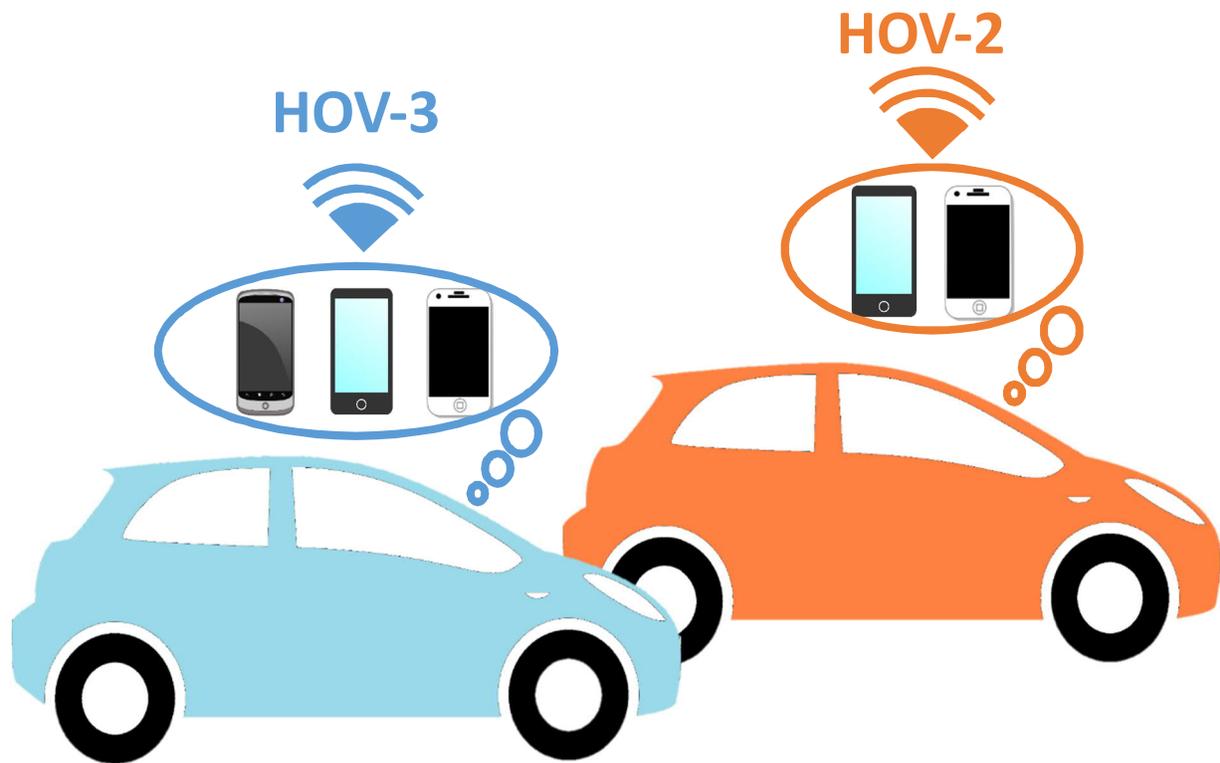


Figure 9: App-Based Declaration

If successful, app-based declaration could eliminate the need for CHP to enforce occupancy violations, allowing them to focus on conventional traffic enforcement actions, while also helping clear crashes and remove debris in lanes. The app would also eliminate the need for a switchable toll tag, (FasTrak Flex®), which agencies would be able to swap out with much less expensive sticker tags. Since the app would be relied upon to verify the number of occupants in a vehicle, express lane users would be charged based on the occupancy level reported by the app – if the app reports an occupancy level that meets the threshold to receive a discount, then a toll discount would be applied; otherwise, the full toll would be assessed. For this to work efficiently, an interface would need to be developed to the toll system or back office to match trips with the occupancy level reported by the app. However, this strategy is subject to the same equity considerations described in Section 3.3.2, in addition to concerns about privacy and related legislative restrictions. It is also critical to evaluate any app-based system to ensure it does not lead to distracted driving.

3.3.3 Consistent Operating Policies

There is regional agreement that consistency of customer-facing operating policies is critical to the smooth functioning of a connected Bay Area Express Lanes Network. So far, this has been accomplished through an informal process involving CTAs, BAIFA, Caltrans and CHP. While this method has been successful, there are several reasons to consider formalizing the process:

1. As the network is built out, not only will more express lanes connect along corridors, but corridors will also begin to connect to each other. This can create complex interactions between multiple operators with different goals, which may affect the user experience;
2. An established process creates expectations among operators of how questions about consistency can be resolved;
3. A documented, formalized process informs MTC and CTA board members and other decision makers on how staff vets ideas with regional partners and develops recommendations; and
4. As a general goal, encouraging consistency and improving the user experience is reaching a critical mass in the Bay Area's public transportation networks due to a Transit Network Management concept contemplated by the Blue Ribbon Transit Recovery Task Force. This strategy raised questions, yet to be explored, about how the Express Lanes Network will adapt to ensure highway operations decisions prioritize seamless express bus service in a more connected future. One such question will be: does the Express Lanes Network need a more centralized governance framework in a connected future?

3.3.3.1 How is the region currently consistent?

The Express Lanes Network is currently consistent in most major operational policies, from customer-facing aspects to back-end processes. Customer-facing policies require consistency to reduce public confusion on how the network works, and include hours of operation, days of operation, and HOV requirements. Consistency in back-end processes such as customer account management is ensured since operators are required by statute to rely on the FasTrak® Regional Customer Service Center (RCSC) for payments and billing.

The express lanes operate per the following policies, which are generally consistent across the region:

- Standard operating hours are Monday through Friday from 5 AM to 8 PM;
- Dynamic tolls change with demand to maintain reliable travel times;
- Toll discounts:
 - Clean Air Vehicles (CAV) use a FasTrak® CAV toll tag to pay half-price toll;
- Tolls are paid electronically using FasTrak®:
 - Solo motorists are required to pay tolls with a FasTrak® or FasTrak Flex® toll tag set to 1 person, and
 - Carpools, vanpools, buses, and motorcycles use a FasTrak Flex® toll tag set to 2 or 3+ people to pay no toll or half-price toll, depending on the facility's tolling rules;
- Consistent FasTrak® practices for customer account management;
- Consistent practices for toll violation processing and fees,
- California Highway Patrol enforcement; and
- Demand-based tolls are set to optimize utilization of the express lanes.

3.3.3.2 How is consistency currently maintained?

Consistency is currently maintained on an ad hoc basis through a number of committees with varying levels of formality. As shown in Figure 10, some express lane policy decisions are governed by Caltrans and others are governed by policy boards with jurisdiction to operate the express lanes. In concept,

regional partners meet to discuss matters that are specific, either in geography (i.e., corridor working groups for connecting segments at the corridor-level) or subject matter (i.e., statutes and enforcement). These discussions inform policies recommended for adoption that are then brought to the respective executive committees before being brought to their respective policy boards or being approved by Caltrans. While not an operating policy per se, the need for coordinated communications to the public has also been raised and is currently accomplished through a Public Information Working Group.

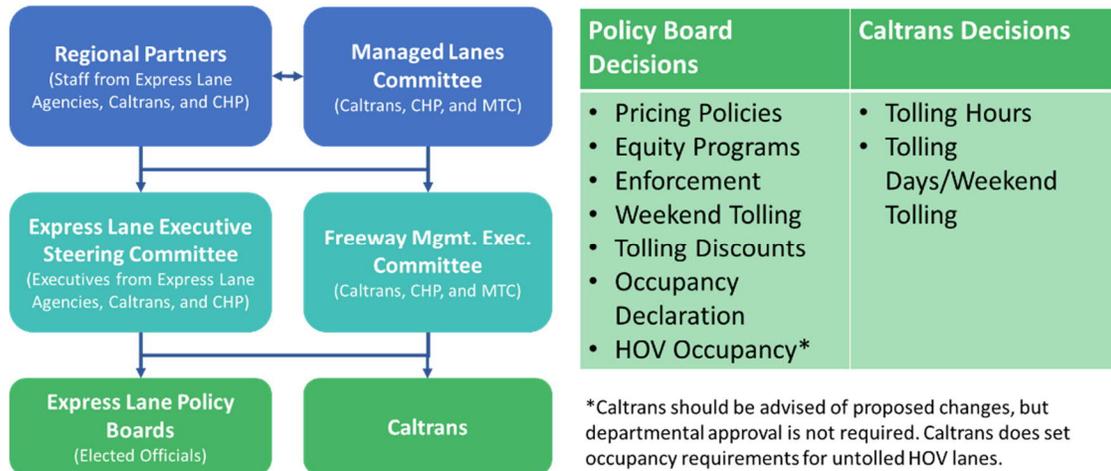


Figure 10: Current consensus-building and approval path for consistent operating policies (left); Chart organizing policies by which group has final authority to implement new policies or changes (right)

3.3.3.3 How should consistency be maintained in the future?

The Express Lanes TAC has begun to consider the level of consistency that should be maintained for different express lane policies as the network becomes more connected, with the overall goal of providing users a consistent experience while balancing the overall operations of individual corridors. Though the conversation on consistency is ongoing, there is broad agreement that different levels of consistency may be warranted as summarized below:

- **Full Consistency Advised:** When policies are required by law to be consistent, use shared back office resources, or significantly affect user experience, all express lanes should have the exact same policies. Such policies should therefore be evaluated by regional stakeholders when the policy is first being proposed by any individual partner or by BATA via the FasTrak® program, since changes could require significant investments by all operators;
- **Evaluation Advised:** Policies may demonstrate local benefits which may or may not effectively transfer or be affordable to the entire network. Some policies may warrant a base level of consistency across the region, with some room to vary based on local conditions. Consistency may be important to have among facilities which connect directly in a corridor but may not be practical nor advised across the entire region. In this more ambiguous case, projects could enter an evaluation process when a facility (1) demonstrates that the policy is feasible and provides a benefit through analysis and (2) connects to or is affiliated from the user perspective with another facility, for example along a single corridor; and
- **Flexibility Advised:** The policy's success may depend on adapting to local conditions. It may be determined that the success of some policies or programs depends on adapting to specific local conditions and needs. In these cases, imposing consistency may interfere with the success of the program, but it is advisable to still vet with regional partners to ensure understanding of new policies and their impacts to other facilities.

MTC and regional express partners are also working toward a regional agreement on what a formal process to maintain operational consistency throughout the Express Lanes Network looks like. This agreement will foster internal and external understanding of how decisions are made about express lane operations and will position the Express Lanes Network for greater effectiveness. The process will be outlined in a Memorandum of Understanding (MOU) to be executed by CTAs, BAIFA, Caltrans, and CHP (see Section 4.2.2).

3.3.4 Funding and Financing

The estimated cost to construct the remaining segments of the Express Lanes Network in Plan Bay Area 2050 is approximately \$3.7 billion. Relying on traditional funding sources alone will not be sufficient to fill the gaps in this remaining need. Seeking alternative funding and financing strategies may be necessary in the future and can help expedite the buildout of the interconnected network.

So far in the Bay Area, express lanes have been delivered relying primarily on state, regional and local funds, and to a lesser extent, federal funds. Most express lane projects in the Bay Area have relied on a combination of funds from these multiple sources. It is likely that the near-term buildout of the Express Lanes Network will continue to rely primarily on these funding sources, although the prospect of a new federal transportation bill or reauthorization could make federal funding a more attractive option. The ability to obtain capital advances from local sales tax revenues and financial institutions and use express lane revenues to pay back the loans is another mechanism that is being used in the Bay Area.

Express lane toll revenues are currently used to fund the operations and maintenance costs of the express lanes and to establish reserves for needed rehabilitation and replacement to keep the express lanes in a state of good repair. Given these needs, as well as other competing demands on the use of net toll revenues that may arise in the future, it is not likely that the use of express lane net toll revenues will be a significant contributor towards building out the remaining Express Lanes Network.

3.3.4.1 Existing Funding Sources

The following provides more detail on existing funding sources to continue the buildout of the Express Lanes Network:

- State:
 - Senate Bill 1 (the Road Repair and Accountability Act of 2017) provides \$5 billion annually allocated by formula and through competitive grant programs. Three of the competitive grant programs provide funding opportunities for express lanes as described below:
 - Solutions for Congested Corridors Program (SCCP): \$250 million annually - capacity increasing projects are restricted to HOV and managed lanes and other non-general purpose lane improvements that improve safety or operations.
 - State-Local Partnership Program (LPP): \$200 million annually - supports the investment that local communities have made in their region through voter-approved transportation measures by matching local funds with state funds.
 - Trade Corridor Enhancement Program (TCEP): \$300 million annually - provides funding for projects that seek to improve corridors that have a high volume of freight traffic.
- Regional:
 - Regional Measure 3 (RM3) is a ballot measure that passed in 2018 to finance a comprehensive suite of highway and transit improvements through an increase in tolls on the region's seven state-owned toll bridges. Toll revenues will be used to finance a

\$4.45 billion slate of highway and transit improvements in the toll bridge corridors and their approach routes, including \$300M for express lanes. Initial programming of \$240 million for the express lanes was adopted by MTC in May 2020. As of January 2021, RM3 is under active litigation pending resolution. Until that occurs, the revenues associated with the toll increase are being held in an escrow account.

- Local:
 - Eight of the nine Bay Area counties have approved dedicated transportation sales tax measures. At least three counties have used their sales tax revenues to fund express lanes, including:
 - Alameda County Measure B half-cent sales tax – The I-580 express lanes were funded, in part, from Measure B capital advance loans up to \$38.5 million. Toll revenue from I-580 will be used to repay this loan.
 - Alameda County Measure BB half-cent sales tax – \$60 million for express lanes on the I-680 corridor in Alameda County.
 - San Mateo County Measure A half-cent sales tax – A loan of up to \$100 million was approved for the US-101 Express Lanes Project.
 - Contra Costa County Measure J half-percent sales tax – \$40 million from Measure J has gone towards the southbound I-680 gap closure project.
- Federal:
 - BUILD Grants - The Better Utilizing Investments to Leverage Development (BUILD) discretionary grant program provides funding for planning and capital investments in road, rail, transit and port projects. Previously known as Transportation Investment Generating Economic Recovery (TIGER) grants, the funds are awarded on a competitive basis for projects that demonstrate significant local or regional impact. Express lane projects in Atlanta and Denver have been successful securing these grants.
 - INFRA Grants – The Infrastructure for Rebuilding America (INFRA) discretionary grant program was established by the 2015 Fixing America’s Surface Transportation (FAST) Act. The program promotes the incorporation of innovative technology that will improve the national transportation system. INFRA grants can be used for up to 60 percent of eligible costs for highway projects on the National Highway System. Express lane projects in Atlanta and Denver have been successful securing these grants.
 - Future Federal Funding - The current federal surface transportation authorization is set to expire on September 30, 2021. With a new administration just taking office, ever growing demands for more investment in the nation’s transportation infrastructure, and the ability for transportation funding to serve as an economic stimulus post pandemic, there is reason to believe that a robust federal authorization could be in the near future. However, it is too early to speculate what kinds of funding opportunities could be available for express lane projects in a future authorization.

3.3.4.2 Financing Options

Financing options rely on obtaining funds from financial institutions or capital markets. These borrowed funds must be repaid with interest. It is common for lenders/investors to require some amount of public funds to be pledged to the project to secure financing. In the Bay Area, some express lane projects have secured loans from sales tax revenue with the expectation that they are to be paid back with future toll revenues. For the Bay Area to better leverage financing options, it may be helpful to pool resources. One option is to establish a regional infrastructure bank that could be backed by other revenue sources, like sales tax revenue, toll revenue, or future state and federal funds. Previous attempts to establish a

regional infrastructure bank⁹ did not prove successful due to disparate goals and requests from different jurisdictions and questions on governance and fund distribution. To be successful, such a venture would require favorable economic conditions, broad consensus among regional participants on how the bank would be governed and funds distributed, and possible changes to statutory restrictions on the use of net revenue across jurisdictional boundaries. However, it is an important strategy to consider in the future since financing opportunities are limited.

Financing options for express lanes include the following:

- **Bond Financing** – Toll revenue bonds are used to generate funds for facilities where repayment is achieved through the collection of tolls. The advantage of bond financing is access to a greater amount of capital, which would allow faster buildout of the Express Lanes Network. However, bond financing requires sufficient revenues to cover principal and interest payments, as well as the establishment of revenue reserves. An investment-grade level traffic and revenue study is typically prepared to provide confidence to investors, with exceptions made for facilities that have a robust track record of net revenue generation. Examples of express lanes that have been successful obtaining bond financing generally feature two express lanes in each direction, with access restrictions and HOV3+ occupancy requirements, which is notably different than the Bay Area Express Lanes Network. Such designs are geared to maximize toll revenue and reduce revenue leakage; however, they also tend to require more road widening and right of way acquisition than the “skinnier,” lower-impact approach pursued in the Bay Area.
- **Commercial loans** - Although commercial bank loans could be an option to secure a share of express lanes funding, the amounts that banks can be expected to offer are probably limited. Unlike securing debt from the bond market where risk is spread out among investors, a bank that issues a loan is taking on all the risk and is therefore not likely to lend large amounts of capital. Furthermore, a larger loan requires higher debt service payments and thus a larger amount of net revenue generation.
- **TIFIA Loans** - The Transportation Infrastructure Finance and Innovation Act (TIFIA) of 1998 provides credit assistance in the form of direct loans, loan guarantees, and standby lines of credit (rather than grants) to projects of national or regional significance. Interest rates for TIFIA loans tend to be much lower than can be expected with toll revenue bonds or commercial loans. However, obtaining a TIFIA loan requires a substantial application process, and the credit assistance has some major requirements including obtaining an investment grade rating and robust project reporting requirements until the loan is fully repaid.

3.3.4.3 Private Investment

Private investment in express lane implementation is typically achieved through a Public-Private Partnership (P3), where a private company enters into a contractual relationship with a public agency to deliver a project. P3s for express lanes and other tolled facilities often involve a long-term concession agreement where the private entity agrees to deliver, operate, and maintain the facility in exchange for the right to collect the toll revenue generated. These agreements can have terms that range from 30 years to as long as 99 years. At the end of the term, the facility reverts to the public owner.

Some of the biggest advantages of P3s include the ability to accelerate project construction and the ability to transfer risks to the private sector. P3s can bring private investment to the table that would otherwise take years or decades to obtain through traditional funding approaches. If a facility already in

⁹ <https://mtc.legistar.com/MeetingDetail.aspx?ID=644512&GUID=6529D007-DA04-4C30-B509-57C59D6DA4E6&Search>

operation were to prove lucrative to private investment, one option could be to sell the facility to a P3 and use the revenue from the sale to fund future express lane investments. In addition, P3s can stipulate regimented operations and maintenance regimes and provisions for rehab and replacement to ensure that the facility is kept in optimal condition throughout the life of the agreement.

Significant changes would be required for P3 to be a feasible option for continued buildout of Bay Area Express Lanes Network. First, a change to state law would be required to even allow public-private partnerships for tolled facilities. And it is not likely that any single express lane facility in the Bay Area would attract sufficient private interest, likely requiring a bundling of facilities to be delivered and operated via a P3. A P3 model could also require ceding control of operational policies like toll rate setting and would require giving up toll revenues, creating increased potential for inconsistency across the regional network.

3.4 Establishing expectations for upcoming disruptions

The buildout of the Express Lanes Network will occur over many years, in parallel with other infrastructure projects, and in an environment of changing policies and traffic trends that may disrupt current plans. This section discusses some of these anticipated disruptions and how the Express Lanes Network can maintain its viability and continue to achieve strategic program goals. Appendix 5.1 provides more detail.

Potential disruptions include the ongoing repercussions of the COVID-19 pandemic, which may have long-lasting effects on traffic and public willingness to take high-occupancy modes. The region will also continue to innovate to reduce GHG emissions with additional GHG/VMT reduction strategies, including consideration of broader highway pricing. Finally, Clean Air Vehicles, Connected Vehicles, and Autonomous Vehicles may be unique among GHG reduction strategies in the varied effects of their long-term adoption and rollout as well as the unknown future of the California Clean Air Vehicle decal program.

3.4.1 COVID-19 Long-Term Impacts

This Strategic Plan recognizes the significant and continuing impact that the COVID-19 pandemic has at the societal level in the United States. From a transportation perspective, the long-term effects of the pandemic on travel behavior are speculative at this point, but may result in long-lasting impacts on travel patterns, particularly as they relate to the willingness to use high-occupancy modes and transit, as well as commuting and work travel. One salient example is the abrupt change to telecommuting brought about by the pandemic and whether this may result in a long-term cultural shift that is more accepting of working out of the office. Such a shift could have long-lasting impacts on traffic patterns and congestion in the region.

MTC has convened the Blue Ribbon Transit Recovery Task Force, a group of thirty elected officials; state representatives; CalSTA; transit operators; business and labor groups; and transit and social justice advocates. The task force was formed to help guide the region's response to pandemic impacts on transit operators and riders. The ongoing efforts of the task force reiterate the importance of early collaboration with transit planners and operators. How the pandemic may affect the types of transit infrastructure decisions made by express lane operators and the ability of transit operators to provide service, is also speculative at this point, but it is important to track the ongoing work emerging from this regional group and carry on in its spirit of collaboration.

The COVID-19 pandemic has also taken its toll on funding for the transportation sector, which tends to rely on local tax measures, gas taxes, and toll revenue that would be negatively impacted by reductions in travel and spending during the pandemic. Its impacts are likely to last for several years after the pandemic ends; however, operators are optimistic that these impacts will not be great enough to significantly alter long-term planning exercises for the express lanes.

3.4.2 Additional GHG/VMT Reduction

The future of GHG and VMT reduction as it pertains to the Express Lanes Network hinges upon two current unknowns: the impacts of Senate Bill 743 on infrastructure building in California and the impacts of other possible future road pricing strategies on Express Lanes Network operations.

3.4.2.1 Senate Bill 743

SB-743's implementation has resulted in transportation projects needing to measure their impacts by estimated changes in VMT under CEQA. Previously, impacts were measured by level of service, a concept which primarily measured changes in congestion or traffic. By focusing on avoiding increases to congestion, developers were incentivized to build outside densely populated cities, causing urban centers to sprawl. In contrast, an increase in VMT would mean that more vehicles are taking trips or that vehicles are taking longer trips, with both outcomes implying that total GHG emissions are also increasing. Reducing VMT requires shorter or less frequent vehicle trips, or a greater number of people per vehicle (i.e., carpooling or transit). Improvements in GHG emissions associated with congestion relief will also factor into the environmental analysis; however, these improvements would need to be demonstrated to outweigh any longer term VMT impacts.

If a project is found to increase VMT during environmental impact analysis under SB-743, sponsors will be required to mitigate that increase by building projects or implementing programs that will provide matching VMT reduction, unless there is a finding of overriding consideration. See Appendix 5.1, Section 5.1.1.1 for more detail on Senate Bill 743 and possible mitigation strategies.

3.4.2.2 Express Lanes and Other Highway Pricing Strategies

As the Bay Area continues to explore GHG reduction strategies for the future, one of the key questions that arises for the Express Lanes Network is how express lanes may fit into a future where pricing is applied more broadly to roadways. One such strategy, referred to as All-Lane Tolling, was included in Plan Bay Area 2050 as a longer-term measure to address traffic congestion that was resilient to uncertainties like varying levels of population growth. This started a discussion about how two pricing schemes may interact on the same facility. Although future pricing strategies can take many forms, Appendix 5.1, Section 5.1.1.2 focuses on issues that may arise from tolling all lanes of a highway (referred to as highway pricing) that has an express lane and includes proposed questions to be incorporated into MTC's future study to understand how the Express Lanes Network may interact with future forms of pricing.

3.4.3 Clean Air Vehicles, Connected Vehicles, and Autonomous Vehicles

When it comes to reducing GHG emissions, promoting the use of clean air vehicles (CAV) may seem like an obvious choice. Feebates (financial rewards for purchasing efficient and alternative fuel vehicles) and policies that permit CAVs to use HOV/express lanes have been used to encourage drivers to switch to hybrid and electric vehicles in California. Governor Gavin Newsom recently issued an executive order requiring all new passenger cars and trucks sold in California to be zero-emissions vehicles by 2035. It is unclear at this point how this executive order will translate into laws, policies, and/or programs.

CAV promotion may have mixed effects across the network when it comes to achieving VMT/GHG and traffic management goals, leading MTC to consistently oppose legislation that expands CAV access to HOV and express lanes. Under the current express lane operating policies, CAVs with qualifying DMV-issued decals can utilize express lanes for a discounted rate. The CAV decal program will end in 2025, and unless extended, all decals will expire. Some lanes in the Bay Area began charging CAVs a 50% toll in Fall 2020, and remaining lanes will follow suit in 2021. Prior to offering a 50% discount, the volume of CAVs using express lanes was on the rise. As an example, it was observed that CAVs accounted for 30 to 40 percent of the total traffic on the 237 Express Lane prior to charging a 50% discount. Although providing this discounted access creates incentive for greater adoption of CAVs, which has an overall positive impact on GHG emissions, it can also decrease express lanes reliability for transit and carpools if too many CAVs utilize the lanes, particularly since CAV users may also be single drivers, decreasing the attractiveness and utility of using these modes on the express lanes.

Connected Vehicles and Autonomous Vehicles (CV/AVs) are another forthcoming technological innovation which may disrupt the way highways function. Since CV/AVs tend to function best in predictable environments like dedicated lanes, some have speculated that managed lanes, including express lanes, could serve as preferential lanes for vehicles with these technologies. Using managed lanes in this way to promote technology adoption would be a fundamental shift from the traditional model of using managed lanes to incentivize high-occupancy modes and maximize person throughput. For example, one potential result of widespread CV/AV adoption is a high prevalence of empty cars on the road that are returning from a drop-off or destined to pick up a passenger. Empty vehicles taking up space on the express lanes could reduce the speed benefits to other users and cause toll prices to increase. On the other hand, if there is widespread adoption of CV/AVs used for shared rides and transit, their use of the express lanes would be consistent with current network and regional goals. Since it is unclear how the adoption and rollout of CV/AVs will unfold, this Plan does not examine their impacts in more detail; however, their impact to the Express Lanes Network will need to be evaluated in future plan updates.



4 Continuing Work

4.1 Recommendations

As a result of the Findings described in Section 3, MTC offers the following recommendations for adoption. MTC cannot accomplish these actions on its own. Several partners, including express lane operators, will need to embrace these actions to achieve results. Furthermore, some of these actions may require redirecting resources or securing additional resources.

4.1.1 GHG/VMT Reduction

Promote regional- and county-level mitigation solutions (All Partners)	As an outcome of SB-743, VMT/GHG impacts are becoming very important for the implementation of the Express Lanes Network. A coordinated VMT/GHG mitigation strategy across the Bay Area Express Lanes Network will likely be a significant undertaking, requiring collaboration between multiple levels of government and all express lane partners. The need to construct at least some capacity-increasing projects provides the impetus to establish innovative solutions like VMT exchanges and banks, but these are very new concepts in nascent stages of development. In the near-term, express lanes partners should closely track the results of VMT impact analysis for upcoming projects, participate in mitigation strategies, and add to the VMT toolbox described above. This work should include consideration of the feasibility, benefits, and risks of committing future express lane revenue to mitigations through a mitigation bank or exchange program. In the long-term, the partners should participate in efforts to finetune VMT mitigation, whether legislatively or administratively, based on how the requirements are shown to affect the ability to provide priority lanes for buses and other high-occupancy vehicles.
Advocate for legislation that allows pilots for the conversion of general purpose lanes to express lanes (CTAs and MTC)	When it comes to lane conversion, general purpose lane conversion is particularly stymied by unclear statutes. There are also real concerns about the operational feasibility of such a strategy, which may rely on specific conditions within individual corridors. It is therefore important that express lane operators continue to advocate for clear opportunities to test or pilot general purpose lane conversions, keeping in mind the ultimate goal of implementation.

4.1.2 Express Bus

Work with transit planners and operators to enhance transit priority and improve accessibility to the express lanes for express buses and other high-occupancy modes through capital investments (All Partners)	The key investments identified by transit operators to maximize the benefits of the express lanes are those that provide direct access to the express lanes without having to manage difficult merging across highway lanes. Transit riders want a service that is fast and reliable with stations that are easy to access. This points to a dual-pronged approach to connect accessible off-freeway stations to the express lanes through targeted placement of direct access on- and off-ramps, which can also benefit other transit, carpools, vanpools, and shuttles. These investments can be costly, especially when requiring right-of-way acquisition, so they should not be undertaken lightly. Express lane operators, counties and Caltrans should give these opportunities due consideration through project-level alternatives analysis to determine whether such investments make sense for each project.
--	---

<p>Since express bus may not perform well everywhere, establish clear criteria and performance metrics to prioritize corridors and guide investments in express bus services (TBD)</p>	<p>Additionally, extensive coordination between transit operators and express lane operators is necessary for express lanes to provide maximum value for express buses and transit, in general. Partners should reach out to express bus operators and transit planners as early as possible and maintain frequent communication and collaboration throughout the project life cycle.</p> <p>Identifying priority corridors for express bus capital investments and service based on robust analysis of travel markets, demand, potential transit ridership, and land use, as well as the potential for bi-directional, all-day service is critical to establishing a healthy regional transit network. The region may benefit from consistent expectations on what characteristics of a corridor may lead to healthy regional transit routes so that investments can be made which will have the greatest effect on achieving regional goals like GHG reduction and transportation equity. As part of its ongoing dialogue with stakeholders on regional consistency, MTC and regional partners should work together to establish these metrics. Specific roles and responsibilities are subject to further definition of the Transit Network Management concept. When corridors are not a good fit for express bus service, net revenue may still be used to promote transit and TDM strategies in general or otherwise reduce GHG/VMT impacts, subject to statutory requirements and availability.</p>
<p>Advocate for transit operators to increase network connectivity, coordination, and communication to take full advantage of the regional Express Lanes Network (All Partners)</p>	<p>For a variety of reasons, the Bay Area has not fully realized the potential for multi-county express bus service. As the Express Lanes Network is continually built out into a connected network, with transit in mind, there is likely to be greater benefit to expanding routes availability between counties. Regional partners should continue to promote and explore opportunities to enhance transit priority and provide seamless bus service that takes advantage of the growing network, while recognizing that express bus strategies will still require analysis to determine viability. There are also several questions that need to be addressed regarding inter-county transit services (e.g., how services would be funded, who would be responsible for providing and maintaining vehicles, how routes would be managed), none of which are addressed in the Strategic Plan. Such questions are outside the purview of express lane operators, which reemphasizes the need to incorporate transit planners and operators in planning before major investment decisions.</p>
<p>Identify opportunities to link transit & TDM investments with SB-743 mitigation strategies while acknowledging operations funding challenges (All Partners)</p>	<p>As the requirements of SB-743 go into effect and projects must mitigate VMT impacts, there may be opportunities to funnel investments into express bus services and other transit and TDM services. For express bus, this would require a better understanding of the magnitude of VMT mitigation that can be achieved by express bus investments. If express bus investments proved to offer sufficient mitigation, and programs such as VMT exchanges and banks were established in the Bay Area, there would be real opportunities to use mitigation funds to build a more robust express bus service. Regional exchanges and banks could also serve to promote other kinds of regionally beneficial transit service. This could be in the form of targeted capital investments or the contribution of net toll revenue, subject to statutory requirements and availability, to subsidize service. If mitigation programs can fund local transit operations, they would ideally be able to offer reliable</p>

and consistent sources of funding to facilitate enduring service. This effort should be undertaken by all partners; however, those currently undertaking project-level environmental review are likely to encounter these opportunities first and can take a lead role in creative problem solving and education.

4.1.3 Strategic Investment Principles

Adopt the framework and investment principles based on two categories: Merit and Readiness. (MTC)

As future funding sources become available where MTC has a role in supporting projects in their selection for funding, MTC would use this framework to incentivize projects to meet regional goals and effectively compete for funds. To this end, MTC would help partners advance Plan Bay Area 2050's vision for the Bay Area. At the same time, the structured framework provides enough flexibility that principles can be emphasized or deemphasized depending upon the requirements of the funding source, and ensures that strategic investment principles do not supersede MTC policies for specific funding programs.

4.1.4 Funding and Financing Strategies

Actively pursue state and federal funding opportunities (All Partners)

The region should continue to actively pursue state and federal funding opportunities. While financing could be a part of the solution, it is unlikely to play a major role in the near-term, primarily because the Bay Area's environmentally friendly approach to express lanes buildout is less attractive to the commercial bond market, and other financing opportunities remain limited.

Senate Bill 1 introduced a new source of much needed transportation funding. Express lane projects in the Bay Area have been successful obtaining funds from each of the three competitive programs under Senate Bill 1. With continued emphasis on building a pipeline of projects that achieve state and regional goals, the region can hopefully continue to rely on state funds for express lanes buildout.

Existing discretionary federal grant programs offer opportunities for express lanes funding, and there is potential that a new authorization could provide sustained or enhanced funding for these types of programs. The region should advocate for funding opportunities that could apply to express lane projects, and as funding becomes available, seek opportunities to put forth competitive projects.

Advocate to include the Express Lanes Network buildout in any future regional funding measure (All Partners)

There continues to be talk of a potential regional measure to generate funds for transportation. The previous measure contemplated for 2020 included consideration of funding for a robust managed lanes network to support regional express bus service. The region should continue to stay engaged in discussions that may reemerge and advocate for the buildout of the Express Lanes Network in any future regional funding measure.

4.2 Near-Term Actions

Several of the findings and recommendations described above also inspire more immediate action, either to expand upon the topic and increase regional acceptance or initiate formal study.

4.2.1 Equity

As described in Section 3.2.3, MTC is currently developing a pilot to test the concept of means-based tolling on its I-880 Express Lanes in Alameda County that would provide a toll discount to users who earn income below 200 percent of the federal poverty threshold. MTC will implement the pilot in the near future to analyze how providing reduced toll rates to low-income users delivers equitable benefits and affects express lane operations. The pilot will tie into the future FasTrak® Regional Customer Service Center Equity Action Plan, which will create a more equitable tolling experience, including fines and penalties. As MTC and express lanes partners continue to evaluate equity on the express lanes, the agencies will consider additional equity initiatives and coordinate with each other and with stakeholders.

4.2.2 Consistent Operating Policies

An immediate next order of business is continuing to work toward a regional agreement on what a formal process to maintain operational consistency throughout the Express Lanes Network looks like through ongoing discussion with express lanes partners, Caltrans, and CHP. Through these discussions, the goal is to come to consensus on a consistency review process that defines at a minimum:

1. The mission and goals of the consistency process;
2. The roles and responsibilities of various stakeholders (e.g., interfacing with Boards or other organizations);
3. The purpose of different meeting groups (e.g., consensus-building, strategic advice, formalizing recommendations); and
4. Guidelines on what levels of consistency we would like to achieve for different types of policies (e.g., full consistency is important for certain policies, while the need for consistency could be evaluated ad hoc for others).

The process will be outlined in an MOU to be executed by CTAs, BAIFA, Caltrans, and CHP. A model of such an agreement is the California Toll Operators Committee (CTOC) MOU, which seeks to promote interoperability and coordination among toll facilities. The CTOC MOU establishes stakeholder responsibilities and expectations on the conduct of business that serve as good examples of what we may hope to accomplish. As with CTOC, all the partners will have a role in defining and executing the process.

Generally, this agreement will foster internal and external understanding of how decisions are made about express lane operations and will position the Express Lanes Network for greater effectiveness.

4.2.3 Enforcement

MTC is currently working on automated HOV enforcement pilots, including camera-based occupancy detection and app-based occupancy declaration, as described in Section 3.3.2. As a next step, MTC looks forward to completing the studies and making recommendations on the implementation of strategies that will hopefully make a significant impact on the operational viability of the Express Lanes Network and the benefits it provides to users.

4.2.4 Road Pricing Strategies

MTC intends to conduct a study of highway pricing strategies to begin as early as 2022 as part of the Plan Bay Area 2050 Implementation Plan. Although the scope of this study is not yet defined, it is expected to include further analysis of how various highway pricing approaches (e.g., all-lane tolling, road user charging) would affect traffic and help the region reduce GHG emissions and meet other regional goals and objectives, including equity. Such a study should include the key questions listed in Section 3.4.2.2.

4.2.5 Plan Bay Area 2050

This Strategic Plan is being released in advance of the Plan Bay Area 2050 Implementation Plan. As an immediate next step, MTC plans to leverage these findings, recommendations, and actions to further inform, integrate with, and advance regional strategic goals. Additionally, as Plan Bay Area 2050 concludes and strategies start to become operationalized, MTC will continue to update this Strategic Plan in collaboration with regional partners and the Commission. This living document is intended to serve as an up-to-date reference on critical forthcoming developments in the region, particularly strengthening the regional transit and express bus network and other near-term actions described above.

4.3 Conclusion

The Express Lanes Network provides a much-needed benefit to help Bay Area residents make transportation choices that will help achieve our regional goals. Reducing congestion, increasing adoption of high-occupancy travel modes, building the network quickly and at a low cost, minimizing greenhouse gas impacts, improving transit priority, safety, and fostering equity are all important pursuits as we continue to build the network.

However, to achieve these goals, MTC and express lane partners must continue to work together to balance the achievement of regional goals under Plan Bay Area 2050 with the practicalities of project construction and completing the network. By maintaining the spirit of collaboration that has carried through express lanes implementation thus far, we can meet challenges through cooperation and working to build consensus.

This spirit will serve express lanes partners particularly well as we navigate the future of transportation in the region, from the immediate effects of the COVID-19 pandemic to the upcoming effects of Senate Bill 743 to the future adoption of green vehicle technology. By creating a consistent strategy for implementing the network over the next thirty years, and continually updating this Strategic Plan to document these strategies, the region can create a network that delivers significant benefits to users while also reducing GHG impacts, increasing transit and carpool use, and promoting transportation equity in the Bay Area.