BAY AREA EXPRESS LANES

MTC Express Lanes Quarterly Report
1st Quarter, January - March, 2019

Submitted: May 2019

BAIFA
BAY AREA INFRASTRUCTURE FINANCING AUTHORITY

METROPOLITAN TRANSPORTATION COMMISSION

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I. PROGRAM HIGHLIGHTS

The purpose of this report is to summarize the progress of delivering Metropolitan Transportation Commission (MTC) Express Lanes. The report covers the first quarter of 2019, January 1 to March 31.

The California Transportation Commission (CTC) approved MTC's application to implement and operate its 270-mile express lane network on October 27, 2011. Soon thereafter, work began to environmentally clear the first phase of express lane conversion projects and produce a Concept of Operations describing how the Express Lanes will operate. The first of MTC's express lanes opened in October 2017 on I-680 in Contra Costa County. Several additional projects are at varying stages of development.

Project Development & Construction	1st Quarter 2019 Highlights	Current Activities
I-880 Alameda (ALA-880) San Leandro to Milpitas *Hegenberger Road/Lewelling Boulevard to Dixon Landing Road*	• The toll system integrator started equipment installation from SR-92 to Hegenberger Rd. • The toll system integrator continued installation of toll system roadside cabinets, median equipment and connections of electrical and fiber conduits in the southern portion of I-880. • The civil contractor successfully removed two existing overhead sign bridge structures at the SR-92 interchange and installed two new ones. • Staff kept residents and stakeholders in the I-880 corridor informed about express lane construction.	• The civil contractor will continue work on civil infrastructure installation and PG&E service connections from SR-92 to Hegenberger Rd. Toll system equipment installation for the full project is expected to be completed in early 2020 and will be followed by testing. • The toll system integrator will install new, numeric HOV occupancy beacons on I-880 to support CHP enforcement of occupancy violations. • Drainage and lane widening work in the Hacienda Ave. area will continue in order to add access lanes into restricted sections of the express lanes. • Monthly construction notices and ramp closure/detour notices continue to be sent. Staff is also preparing customer education materials and outreach strategies in advance of lane opening in 2020. • Staff anticipates revising the projected opening date from early 2020 to later in 2020 to reflect delays in toll system installation due largely to weather, shortage of qualified contractor staff, and sequencing of work relative to civil construction activities.
I-680 Contra Costa Southern Segment (CC-680 South) Walnut Creek to San Ramon *Livorna Road/Rudgear Road to Alcosta Boulevard*	• See Appendix C for second quarter performance data.	• Project complete; see Appendix B for archived summary.

Project Development & Construction	1st Quarter 2019 Highlights	Current Activities
I-680 Contra Costa Northern Segment Southbound (CC-680 North SB) Martinez to Walnut Creek *Marina Vista Boulevard to Rudgear Road/SR 242*	• The civil contractor completed construction of foundations for overhead sign structures, toll reader gantries and highway lighting, and began construction of the new concrete median barrier on I-680 between the Benicia-Martinez Bridge and SR-242. On I-680 between SR-24 and Livorna Rd., the civil contractor completed demolition of the concrete median barrier and horizontal direction drilling for the new fiber optic conduit that will reroute the backhaul fiber currently in use due to lane widening in Walnut Creek. • A contract change order was executed with the backhaul contractor to reroute backhaul fiber in Walnut Creek prior to lane widening. Replacement fiber cable was procured.	• The civil contractor will continue construction of the new median barrier between the Benicia-Martinez Bridge and SR-242. From south of SR-24 to Livorna Rd., the contractor will complete construction of the fiber optic conduit for the backhaul reroute. • The replacement planting design continues to be updated to incorporate public feedback. Project staff is incorporating Caltrans' oversight of this work into the existing construction cooperative agreement between Caltrans and CCTA. • The backhaul contractor will start to reroute in-use backhaul fiber in Walnut Creek. The toll system integrator will disconnect and reconnect live toll equipment from the old to the new fiber with no planned disruption to I-680 Southern Segment express lanes operations. • Caltrans is finalizing the construction cooperative agreement with BAIFA for Caltrans' oversight services of the toll system integrator contract.
I-80 Solano (SOL-80) Fairfield to Vacaville *Red Top Road to I-505*	• Caltrans submitted this project for a Federal INFRA grant in March 2019.	• The project is shelf-ready should construction funds become available. • Caltrans, MTC and STA staff are waiting to learn if the project will receive an INFRA grant. • MTC and STA staff continue to explore other potential funding sources.
Program Management	• Staff continued to coordinate with San Mateo County transportation agencies' staff on the terms of an agreement for BAIFA to deliver the toll system and operate the US-101 express lanes. • Staff completed a Request For Information about smartphone app-based vehicle occupancy verification systems.	• Staff is beginning to prepare procurements to hire vendors to pilot both smartphone app-based and roadside camera-based vehicle occupancy verification technologies. • Staff is working with other Bay Area Express Lane operators to coordinate messaging related to future lane operating policies. • Staff has developed a Stakeholder and Customer Outreach Plan for the I-880 Express Lanes and is preparing outreach materials. • Staff is beginning to draft proposed changes to the Toll Ordinance in anticipation of I-880 opening in 2020.
Toll System	• The I-680 Southern Segment Operations Testing began.	• The toll system integrator and the FasTrak® back office continue to test an updated regional interface control document to enable the two systems to communicate and share 6C compliant data. • The I-680 Southern Segment Operations Testing will continue. The goal is to complete testing by June 2019.

II. PROGRAM OVERVIEW

A. Program Description

MTC and partner agencies are implementing a regional network of express lanes called Bay Area Express Lanes. Upon completion, Bay Area Express Lanes will comprise 600 miles of express lanes operated by MTC, the Valley Transportation

Authority (VTA), the Alameda County Transportation Commission (Alameda CTC) and the Sunol Smart Corridors Joint Powers Authority (Sunol JPA), and by San Mateo County transportation agencies.

Primary objectives for Bay Area Express Lanes include:

- Create a seamless network of HOV lanes to encourage carpools, vanpools and express buses;
- Make the best use of HOV lane capacity;
- Provide reliable travel times for solo drivers; and
- Better manage all lanes to keep traffic moving.

MTC's portion of the Bay Area Express Lanes, referred to as MTC Express Lanes, will include 270 miles of express lanes – 150 miles of converted high occupancy vehicle (HOV) lanes and 120 miles of new lanes – on I-80 in Alameda, Contra Costa and Solano Counties; I-880 in Alameda County; I-680 in Contra Costa and Solano counties; and the westbound approaches to the Bay Bridge, San Mateo Bridge and Dumbarton Bridge. In addition, MTC will operate 45 miles of new and converted lanes on US-101 in San Mateo County for San Mateo County transportation agencies.

Appendix B includes an overview of how express lanes operate.

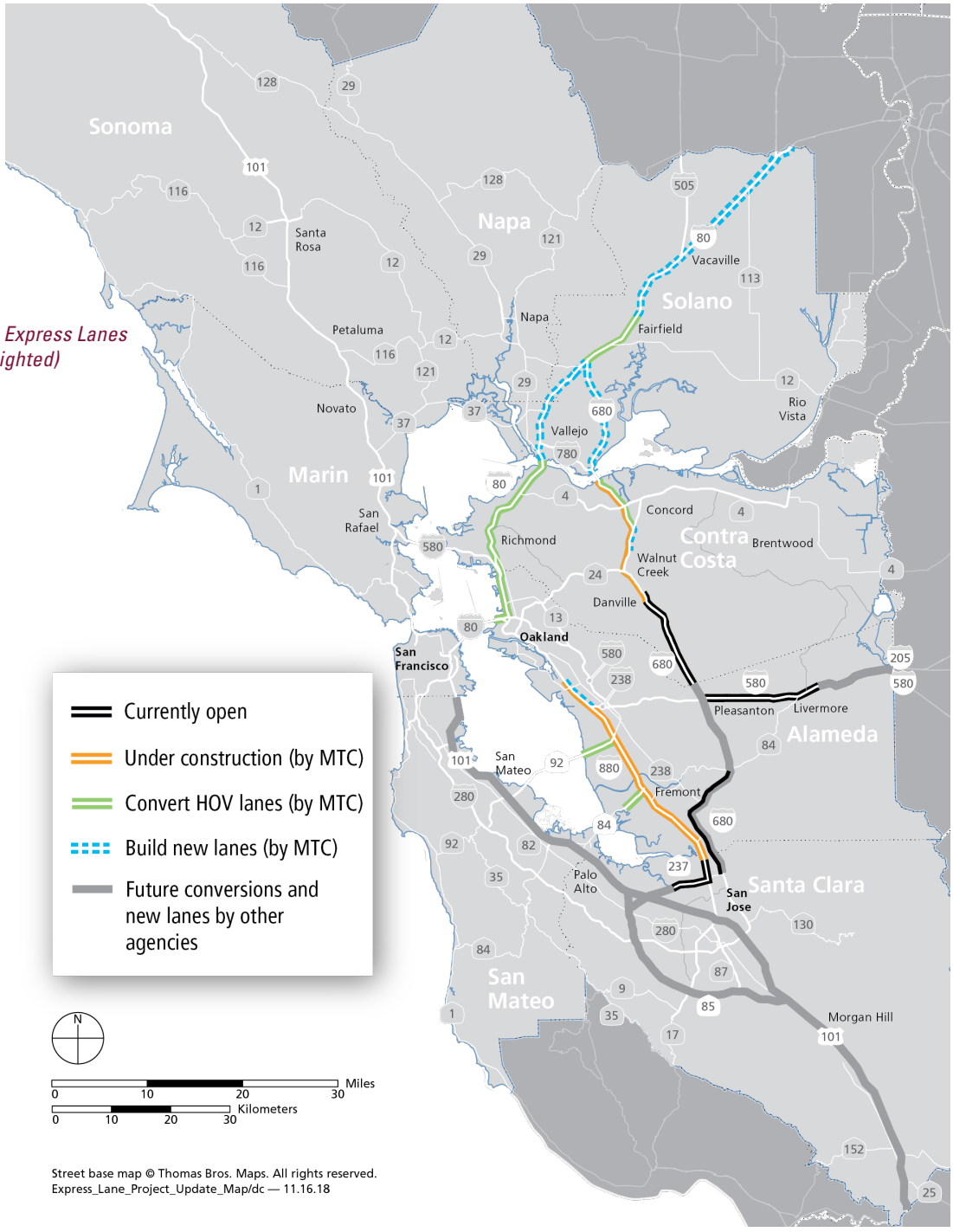
Map of Bay Area Express Lane Network

B. Operating Authority

MTC and the Bay Area Toll Authority (BATA) have formed a joint powers authority to develop and operate MTC Express Lanes. The joint powers authority, known as the Bay Area Infrastructure Financing Authority (BAIFA), is composed primarily of representatives of the three counties where the express lanes are located: Alameda, Contra Costa and Solano. BAIFA is responsible for policy and operational decisions such as toll rates, project phasing and use of revenue. BAIFA will also operate the toll system on US-101 in San Mateo County under contract to San Mateo County transportation agencies, which are responsible for project delivery, operational policy and use of revenue.

The map below highlights MTC's portion of Bay Area Express Lanes and shows where lanes will be converted from HOV lanes and where new lanes will be added.

Map of Bay Area Express Lanes (MTC lanes highlighted)



C. MTC Express Lane Project Funding

MTC is using existing funding to convert existing HOV lanes to express lanes and to conduct environmental studies and design on some gap closure projects, so they are "shelf-ready" should construction funding become available. This will allow MTC to open as much of its 270-mile network as quickly as possible.

The table below lists the projects that comprise MTC Express Lanes according to current funding status.

County	Route	Project	Geographical Limits	Miles	Environmental	Design	Construction
NEAR-TERM CONVERSIONS AND GAP CLOSURE OPPORTUNITY PROJECTS							
ALA	880	I-880 Alameda	Between San Leandro and Milpitas *Hegenberger Rd./Lewelling Blvd. to Dixon Landing Rd.*	51	●	●	●
CC	680	I-680 Contra Costa Southern Segment	Between Walnut Creek and San Ramon *Livorna Rd./Rudgear Rd. to Alcosta Blvd.*	23	●	●	●
					Project completed 2017		
CC	680	I-680 Contra Costa Northern Segment Southbound	Martinez to Walnut Creek *Marina Vista Blvd. to Rudgear Rd.*	11	●	●	●
SOL	80	I-80 Solano	Fairfield to Vacaville *Red Top Rd. to I-505*	36	●	●	○
MID-TERM CONVERSIONS AND GAP CLOSURE OPPORTUNITY PROJECTS							
ALA/ CC	80	I-80 and Westbound Approaches to the Bay Bridge	Between Crockett and Bay Bridge *Cummings Skyway to Bay Bridge; I-80, I-580, I-880 and West Grand approaches to Bay Bridge*	44	◖	○	○
ALA/ SM	84	Dumbarton Bridge Western Approach	Fremont/Newark *I-880 to Dumbarton Bridge*	3	●	○	○
ALA/ SM	92	San Mateo Bridge Westbound Approach	Hayward *I-880 to San Mateo Bridge*	3	●	○	○
CC	680	I-680 Contra Costa Northbound Express Lane Completion	Walnut Creek to Benicia *North Main St. to Marina Vista Blvd.*	9	○	○	○

KEY

● Funded ◖ Partially Funded ○ Unfunded ALA = Alameda, CC = Contra Costa, SM = San Mateo, SOL = Solano

III. CAPITAL DELIVERY

A. Schedule

The schedule summary below reflects the "open to traffic" dates of the original "baseline" schedule, and the current completion forecast for the projects that are fully funded.

Project	Baseline Opening	Forecast Opening	Confidence Level	Detail Page
I-880 Alameda (ALA-880) San Leandro and Milpitas *Hegenberger Rd./Lewelling Blvd. to Dixon Landing Rd.*	Spring 2019	Spring 2020	🔴	15
I-680 Contra Costa Southern Segment (CC-680 South) Walnut Creek and San Ramon *Livorna Rd./Rudgear Rd. to Alcosta Blvd.*	Fall 2016	Fall 2017 Actual	🟢	A-5
I-680 Contra Costa Northern Segment Southbound (CC-680 North SB) Martinez to Walnut Creek *Marina Vista Blvd. to Rudgear Rd.*	Fall 2018	Fall 2021	🟡	19

KEY

- 🟢 Within schedule shown.
- 🟡 Identified potential risks that may significantly impact schedule if not mitigated. See *Section III.D Risk Management Plan* for further discussion of schedule risk.
- 🔴 Known impact to schedule, changes forthcoming.

B. Capital Costs

The cost summary below shows: 1) the costs of each express lane [corridor or segment] including planning, design and construction of the civil infrastructure, and installation and integration of the backhaul communications and toll system, and 2) programwide costs including planning and design, and implementation of centralized elements of the backhaul network and toll system. The total cost estimate includes the full estimated cost to complete MTC Express Lanes. The approved Expenditure Plan fully funds the first three projects listed below, the environmental and design phases for the I-80 projects in Solano County, and the environmental phase for the westbound approaches to the San Mateo and Dumbarton Bridges. The expended-as-of amounts shown represent the amount of BATA Express Lane funds expended through March 31, 2019. The confidence level assessment reflects potential risks to each project budget; for more information, see Section III.D Risk Management Plan.

Project[1]	Total Cost Estimate[2]	Cost Estimate, Funded Phases[3]	Regional Measure 2 Funds (allocated)	Other Funding (allocated)	BATA Express Lane Funds[4]			Percent Complete[5]	Confidence Level[6]
					July 2018 Amendment	Sept. 2018 Amendment	Expended as of 3/31/19		
NEAR-TERM CONVERSIONS AND GAP CLOSURE OPPORTUNITY PROJECTS									*Costs shown in millions of escalated dollars*
I-880 Alameda	139.1	139.1			135.5	139.1	96.3	75%	🟡
I-680 Contra Costa Southern Segment	54.0	54.0			55.6	54.0	52.3	98%	🟢
I-680 Contra Costa Northern Segment Southbound [7]	127.4	127.4	19.4	54.3	51.3	53.6	7.1	30%	🟡
I-80 Solano	228.2	33.3	15.2		19.0	18.1	11.2	20%	🟡
Centralized Toll System	32.4	32.4			33.6	32.4	20.4	80%	🟢
Program Planning, Coordination & Management	28.4	28.4			28.4	28.4	19.8	70%	🟢
Program Contingency	6.1	6.1			5.1	2.9			🔴
Capitalized Start-up O&M	16.0	16.0			16.0	16.0	4.8		🟢
MID-TERM CONVERSIONS AND GAP CLOSURE OPPORTUNITY PROJECTS									
I-80 Alameda/Contra Costa and Westbound approaches to the Bay Bridge (I-80, I-580, I-880, West Grand)	193.0	5.0	5.0						
Dumbarton Bridge Westbound Approach (SR-84)	9.0	0.3			0.3	0.3	0.3	5%	
San Mateo Bridge Westbound Approach (SR-92)	10.0	0.4			0.4	0.4	0.4	5%	
I-680 Contra Costa Northbound Express Lane Completion [8]	390.0	21.5	1.5	20.0				5%	
Centralized & Program Costs & Start-Up O&M - Gap Closures & Future Conversions	TBD								
TOTALS	**1,233.6**	**463.9**	**41.1**	**74.3**	**345.2**	**345.2**	**212.6**	**60%**	

(1) Other Gap Closure and Extension projects not shown: ALA-880 extension northbound from Lewelling to Hegenberger; SOL-80 gap closure from Carquinez Bridge to Red Top Road; SOL-80 extension east of I-505; SOL-680 gap closure from Benicia to Cordelia

(2) Total Cost Estimate represents current estimated cost to complete each project.

(3) Cost Estimate, Funded Phases represents current estimated cost to complete phases that are funded for each project.

(4) BATA Express Lane Funds represent the funds that have been allocated from the BATA budget.

(5) Percent completes shown are based on the achievement of major milestones, whether those milestones were completed using BAIFA funds or other funds. Projects that have completed milestones using other funds include I-680 Contra Costa Northern Segment Southbound and I-80 Solano.

(6) 🟢 = Within budget, 🟡 = identified potential risks that may significantly exceed budget if not mitigated, 🔴 = Known impacts to budget - changes forthcoming.

(7) Cost represents the total for HOV Completion and Conversion to Express Lanes. Other funds committed to the HOV Completion portion include Measure J ($38.7M) and STIP ($15.6M).

(8) Represents completion of HOV lane through Walnut Creek to SR-242 and conversion of existing HOV lane north of SR-242, which were previously listed separately.

C. Change Management

The change management process captures the changes in the program that have an impact on the approved scope, schedule and budget baselines. There were no changes to the MTC Express Lanes Program budget in the first quarter of 2019.

D. Risk Management Plan

MTC manages risk at both the program and contract level by identifying risks that could negatively impact the program's cost and schedule, and assigning responsibility to the person best positioned to manage each risk. Risks managed at the contract level are associated with contingency funding authorized by BAIFA for specific contracts. Risks managed at the program level would draw upon the program contingency line item in the Express Lanes Expenditure Plan. Staff regularly review the risk exposure and mitigation plans at both the contract and program level.

Chart #1 shows the median risk exposure for the program-level risks using Monte Carlo analysis. As of March 31, 2019, the risk exposure stands at $6.2 million, which is higher than the $5.9 million reported last quarter. This increase is due to new risks related to the potential for damage to fiber optic cable installed in the work areas of other current and planned projects, and delays in toll system integrator work on I-880 leading to cascading delays to scheduled toll system work on the I-680 Northern Segment.

Chart #2 tracks the program's cost forecast and risk exposure as compared to the authorized program budget. Consistent with the amendment to the Expenditure Plan that was adopted on September 26, 2018, the amount of BATA Express Lane Funds allocated to specific express lanes projects is $342.3 million, plus program contingency, for a total authorized budget of $345.2 million.

The current program contingency of $2.9 million would fall short if the risk exposure of $6.2 million were to be realized. While there are few individual risks with major cost impacts, there are many risks with minor cost impacts, resulting in an overall significant risk exposure. Staff remains diligent in managing cost and risk while seeking new funding opportunities.

The top contributors to the program-level risk exposure and the associated mitigation strategies are as follows:

I-880 Alameda

- The most significant risk that could affect cost relates to the location of a pricing sign on I-880 southbound in a restricted access portion of the express lane. The team evaluated relocating the sign versus updating the toll system design to accommodate the sign location, and chose the latter as the preferred option in April (after the reported risk exposure calculation), which is expected to cost less than relocating the sign. As a result, MTC staff expects the risk exposure for this item to decrease in the next quarterly report.
- Another risk to cost relates to Caltrans requiring BAIFA and other express lanes operators to change the agreed-upon approach to toll segment pricing, affecting the toll system, pricing signs and public information. MTC staff is working with Caltrans staff to resolve this issue.
- The most significant risk that could affect schedule relates to toll system delays and impacts to opening I-880. The

Chart #1: Median Risk Exposure ($M)

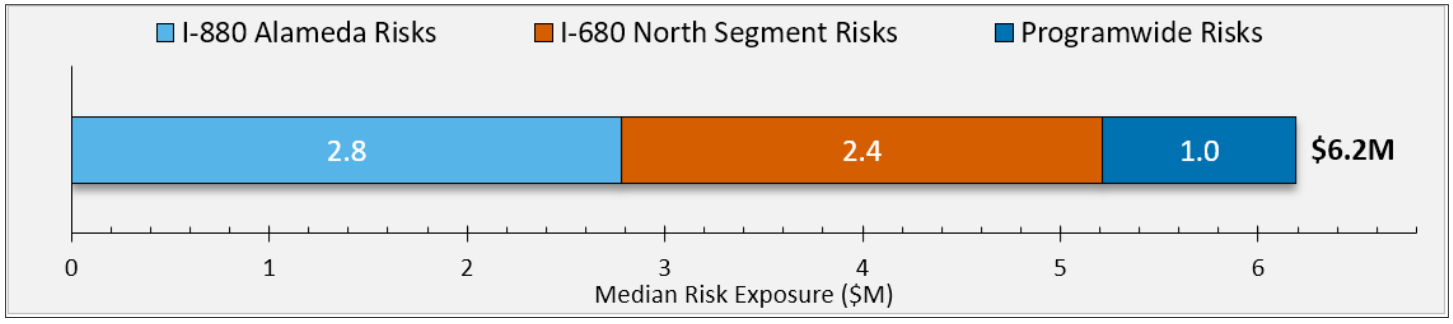


Chart #1 shows the contribution of each project's risks toward the total program risk exposure. Risk exposure is calculated using Monte Carlo simulation.

toll system integrator has been delayed significantly for reasons including challenges coordinating with civil construction, weather and staffing related issues. MTC staff is working with the toll system integrator to evaluate schedule delays and create a strategy for a timely completion of work. However, these issues will likely delay completion of express lanes toll system work, and impact the open-to-traffic date.

- Additional schedule risks could result from delays in hook-ups to the AT&T communication network for the backhaul, delays in installation of power drops by PG&E and delays in handoff of backhaul infrastructure affecting completion of backhaul network integration. Staff is actively monitoring these risks.

I-680 Contra Costa Northern Segment Southbound

- The most significant risk that could affect schedule relates to a Caltrans-managed safety project in the corridor. Coordination with the project may delay completion of express lanes work and impact the open-to-traffic date. Caltrans has committed to work with MTC when scheduling their work on the safety project. Additional schedule risks are being actively monitored, including potential delay to civil contract delivery caused by unanticipated field conditions, contract specifications, weather and PG&E utility connections.
- Risks that could affect cost relate to the potential for change in signage requirements by Caltrans that may apply to express lanes, and additional work resulting from unanticipated field conditions encountered during construction and conflicts between express lane / backhaul equipment and new Caltrans projects. MTC staff continues to coordinate with Caltrans to minimize cost impacts.
- Additional schedule and cost risks could arise due to delays in delivery of the I-880 toll system. Based on progress made on the I-880 corridor to date, there is a risk that the toll system integrator may not be available to work on I-680 until the completion of I-880. MTC staff is tracking I-880 delays and creating a contingency plan to reduce impacts in the event of further significant schedule delays on I-880.

Programwide Risks

- Potential changes to state or national interoperability requirements may cause changes to design or operational policy that may have cost impacts for MTC's Express Lanes Program. The California Toll Operators Committee has a goal that all operators will be able to read and process 6C transactions by spring of 2019. This requires tuning toll tag readers for the I-680 Contra Costa Southern Segment and making sure that the toll system and FasTrak® back office communicate and process 6C transactions correctly, and thus may have cost impacts for MTC's Express Lanes. This risk is being managed by participating in the development plan of the transition from Title 21 compliant toll technology to 6C compliant toll technology.

Chart #2: Program Cost Forecast and Risk Exposure vs. Authorized Budget ($M)

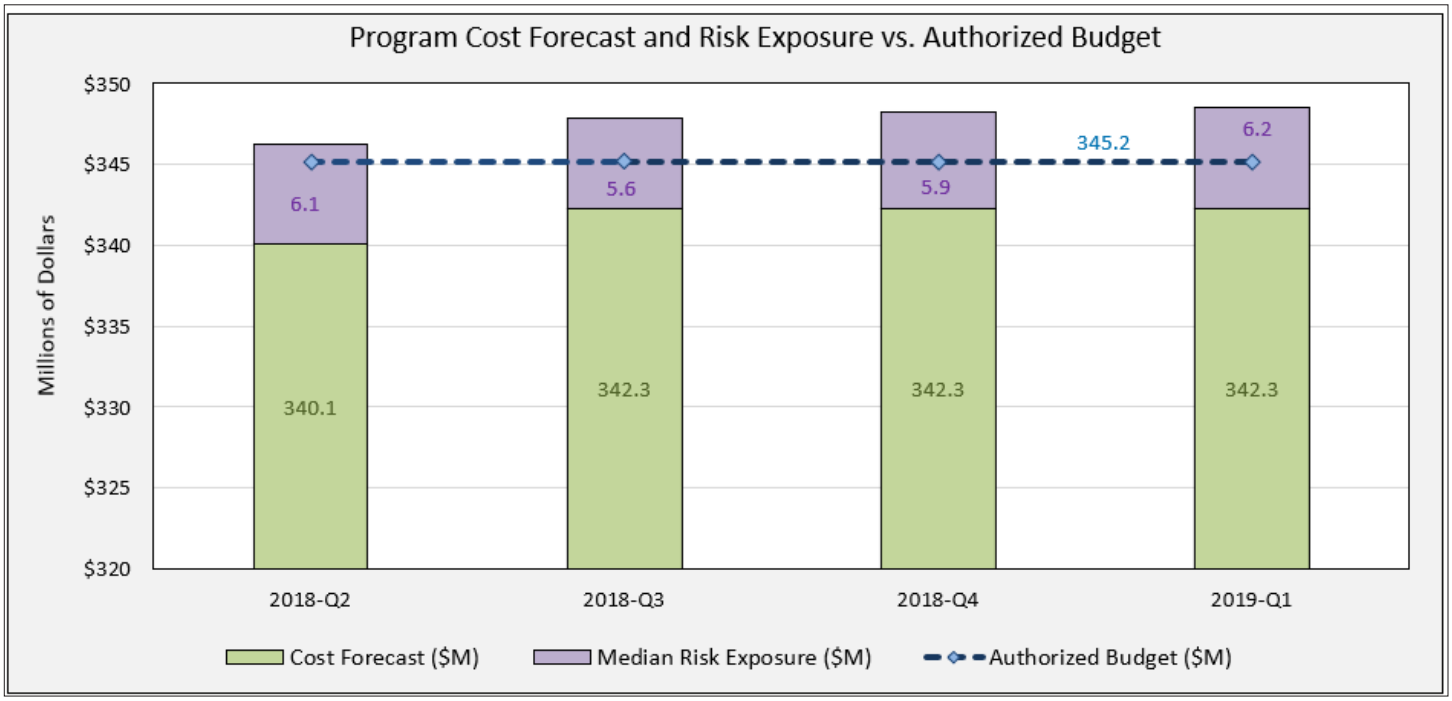


Chart #2 shows the program cost forecast and risk exposure as compared to the authorized program budget.

E. Active Capital Project Summaries

Centralized Functions

Toll System and Program Management, Planning and Regional Coordination

Total Estimated Cost

$32.4 million for the Centralized Toll System
$28.4 for Program Planning, Coordination and Management

Schedule

Centralized Toll System was ready for the opening of the I-680 Contra Costa Southern Segment on October 9, 2017.

Program Planning, Coordination and Management is ongoing through the opening of the funded projects.

Project Description

The Centralized Toll System includes the elements of the toll system that are needed to toll all the express lanes, as well as the backhaul communications network components, such as fiber optic cable and leased line services, that transport toll data from MTC lanes to host and toll operations data centers. Centralized toll system work includes designing and implementing the hardware and software for dynamic toll setting and trip building, integration with the FasTrak® Customer Service Center, and acquiring spare parts.

Program management, planning and regional coordination tasks include managing the expenditure plan, cost, schedule and risk; developing the express lane business rules and toll ordinance; conducting customer education and outreach; building out the Regional Operations Center and developing operating procedures; planning for future express lanes; and coordinating with partner agencies to offer a seamless experience for drivers.

Program Management Highlights and Progress

- Staff continued to coordinate with San Mateo County transportation agencies' staff on the terms of an agreement for BAIFA to deliver the toll system and operate the US-101 express lanes in San Mateo County.
- Staff completed a Request For Information about smartphone app-based vehicle occupancy verification systems to learn about the strengths and weaknesses of the technology. Staff presented the results to MTC's Operations Committee in April 2019.

Current Program Management Activities

- Staff is beginning to prepare procurements to hire vendors to pilot both smartphone app-based and roadside camera-based vehicle occupancy verification technologies. The goal of the app-based pilot is to verify accuracy, gauge public acceptance and gain experience with the technology. The goal of the camera-based pilot is to identify violators in a tolled environment and charge them the toll they should have paid.
- Staff is working with other Bay Area Express Lane operators to coordinate messaging related to future lane operating policies.
- Staff has developed a Stakeholder and Customer Outreach Plan for the I-880 Express Lanes and is preparing outreach materials.
- Staff is beginning to draft proposed changes to the Toll Ordinance in anticipation of I-880 opening, with an HOV-3 occupancy requirement, and clean air vehicle tolling. BAIFA will be asked to approve the revised Toll Ordinance in fall 2019, following a public process.

Toll System Highlights and Progress

- The toll system integrator contract was awarded in June 2014.
- Buildout of the Regional Operations Center was finished in March 2017.
- The toll system went live to the public on October 9, 2017.
- In December 2018, the toll system integrator contract was extended to June 2023 to include the I-680 Northern Segment. The change removed the I-80 Solano express lanes from the contract. It will be added back when construction funding is secured.
- The I-680 Southern Segment Operations Testing began in February 2019. Operations Testing is a system acceptance test. The Operations & Maintenance (O&M) phase of the toll system integrator contract will start upon its completion.

Close-up of toll system equipment under sign (enforcement beacons, reader antennae and laser trigger)

Photos courtesy of Noah Berger

Current Toll System Activities

- The toll system integrator and the FasTrak® back office continue to test an updated regional interface control document to enable the two systems to communicate and share 6C compliant data. The goals are for the toll system to read 6C toll tags, create trips and send them to the back office for processing by spring 2019 and to allow for discount tolling of clean air vehicles by the launch of I-880.
- The I-680 Southern Segment Operations Testing will continue. The goal is to complete testing by June 2019.

Overhead hours of operation sign and toll system equipment on the I-680 Express Lanes

Overhead pricing sign on the I-680 Express Lanes

I-880 Alameda (ALA-880)

Oakland to Milpitas

Hegenberger Road/Lewelling Boulevard to Dixon Landing Road

Total Cost Estimate

$139.1 million

Scheduled Open Date

Spring 2020

Project Description

The project converts the existing I-880 HOV lanes that run from Hegenberger Road to Dixon Landing Road in the southbound direction and from Dixon Landing Road to Lewelling Boulevard in the northbound direction to express lanes.

The conversion involves lane striping and installing sign structures, signs, FasTrak® toll tag readers, traffic monitoring video cameras, lighting, a data communications network and California Highway Patrol observation areas. The highway is also being widened in three locations to accommodate merge lanes into and out of the express lanes. It will result in 51 express lane miles between Oakland and Milpitas.

The express lanes conversion project is being coordinated with a median barrier reconstruction project and a pavement resurfacing project, both led by Caltrans. The median barrier reconstruction project installed foundations and otherinfrastructure required for the express lanes for a large portion of the corridor.

Project Highlights and Progress

- Public open house was held in March 2015.
- Preliminary engineering report and environmental document were completed in October 2016.
- The express lanes civil contractor began construction in September 2017.
- Caltrans approved the toll system design and issued the encroachment permit for the toll system integrator in March 2018.
- MTC's express lanes scope of work delivered through Caltrans' median barrier contract was completed in the second quarter of 2018, including barrier demolition, express lane sign structure foundations and light foundations.
- Civil infrastructure installation and PG&E service connections from Dixon Landing Rd. to SR-92 were completed as of October 2018.
- Caltrans finalized the design of fiber laterals to connect its freeway management equipment to the communications backhaul in December 2018. Installation will be added to the express lane civil construction contract as a change order.
- The contractor completed installation of backhaul fiber for the entire express lane corridor and network hubs connecting field equipment to data centers in San Francisco, Martinez and Oakland in December 2018.
- In January 2019, the toll system integrator started equipment installation from SR-92 to Hegenberger Rd.
- The toll system integrator continued installation of toll system roadside cabinets, median equipment and

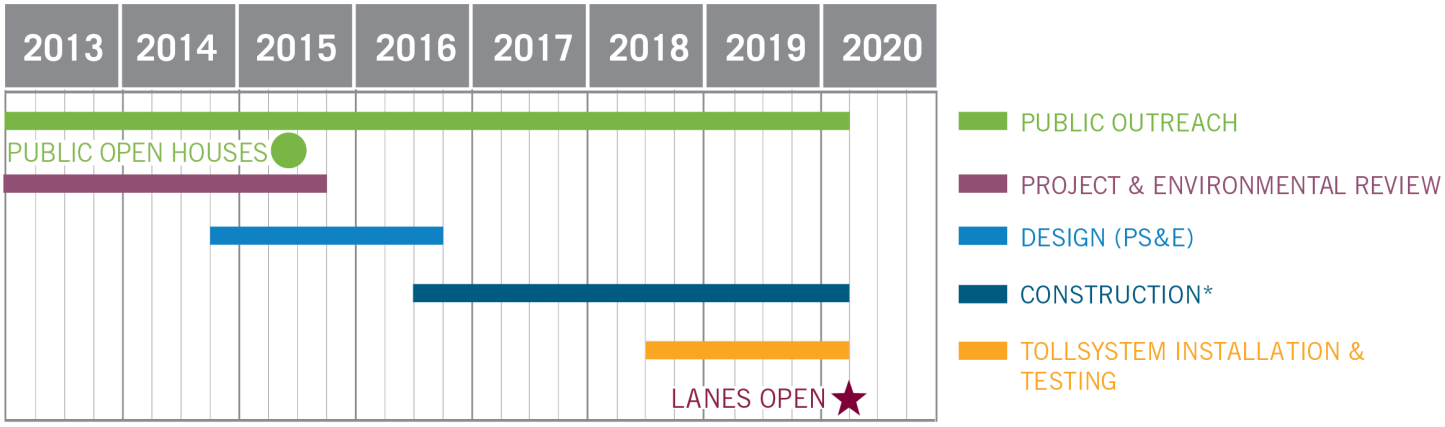
connections of electrical and fiber conduits in the southern portion of I-880 from Dixon Landing Rd. to SR-84 in the first quarter of 2019.

- In March 2019, the civil contractor successfully removed two existing overhead sign bridge structures at the SR-92 interchange and installed two new ones.
- Staff kept residents and stakeholders in the I-880 corridor informed about express lane construction.

Current Project Activities

- The express lane civil contractor will continue work on civil infrastructure installation and PG&E service connections from SR-92 to Hegenberger Rd., which is 95% complete.
- The toll system integrator will continue equipment installation from Dixon Landing Rd. to SR-92, which is 35% complete, and will continue equipment installation from SR-92 to Hegenberger Rd., which is 10% complete. Toll system equipment installation for the full project is expected to be completed in early 2020 and will be followed by testing.
- The toll system integrator will install new, numeric HOV occupancy beacons on I-880 to support CHP enforcement of occupancy violations.
- Drainage and lane widening work in the Hacienda Ave. area continues in order to add access lanes into restricted sections of the express lanes.
- Monthly construction notices and ramp closure/detour notices continue to be sent. Staff is also preparing customer education materials and outreach strategies in advance of lane opening in 2020.
- Staff anticipates revising the projected opening date from early 2020 to later in 2020 to reflect delays in toll system installation due largely to weather, shortage of qualified contractor staff, and sequencing of work relative to civil construction activities.

Project Schedule by Phase



*Includes I-880 median barrier improvements.

Project Cost

Total Cost Estimate[1]	Cost Estimate, Funded Phases[2]	Regional Measure 2 Funds (allocated)	Other Funding (allocated)	BATA Express Lane Funds[3]			Percent Complete[4]
				July 2018 Amendment	Sept. 2018 Amendment	Expended as of 3/31/19	
139.1	139.1			135.5	139.1	96.3	75%

The cost estimate for this project includes planning, design, construction, utilities, backhaul communications and toll system integration.

Costs shown in millions of escalated dollars.

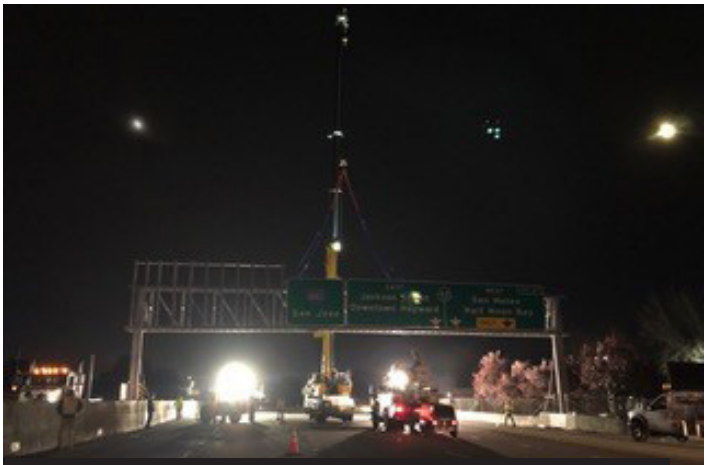
(1) Total Cost Estimate represents current estimated cost to complete each project.

(2) Cost Estimate, Funded Phases represents current estimated cost to complete phases that are funded for each project.

(3) BATA Express Lane Funds represent the funds that have been allocated from the BATA budget.

(4) Percent complete shown is based on the achievement of major milestones whether those milestones were completed using BAIFA funds or other funds.

Offloading a new sign bridge on I-880 at West A St.



Erecting a new sign bridge on I-880 at Winton Ave.

Elevated view of enforcement area on I-880 in Fremont

I-680 Northern Segment Southbound (CC-680 North SB)

Martinez to Walnut Creek

Benicia Bridge to Rudgear Road

Total Cost Estimate

$127.4 million ($53.6 million to be funded by BAIFA)

Scheduled Open Date

Fall 2021

Project Description

The project will convert 11 miles of the existing HOV lane on southbound I-680 from just south of Marina Vista Avenue in Martinez to North Main Street in Walnut Creek into an express lane. It also includes express lane elements for the I-680 Southbound HOV Completion Project. Once complete, I-680 will have a continuous southbound express lane from Martinez to the Alameda County line.

Civil construction will be delivered by the Contra Costa Transportation Authority (CCTA). MTC will install toll and communications equipment and will operate the express lanes.

Project Highlights and Progress

- Caltrans signed the environmental document in December 2016 and approved the Project Report in August 2017. Caltrans completed a revalidation in September 2017.
- A contract to remove trees along southbound I-680 in Walnut Creek between South Main Street and Livorna Road was awarded in October 2017, and work was completed in December 2017.
- All utility relocations were completed as of August 2018.
- Construction started October 1, 2018, and a ground-breaking event was held October 3, 2018.
- In December 2018, the toll system integrator contract was extended to June 2023 to include the I-680 Northern Segment.
- In March 2019, the civil contractor completed construction of foundations for overhead sign structures, toll reader gantries and highway lighting and began construction of the new concrete median barrier on I-680 between the Benicia-Martinez Bridge and SR-242. On I-680 between SR-24 and Livorna Rd., the civil contractor completed demolition of the concrete median barrier and horizontal direction drilling for the new fiber optic conduit that will reroute the backhaul fiber currently in use due to lane widening in Walnut Creek.
- In March 2019, a contract change order was executed with the backhaul contractor to reroute backhaul fiber in Walnut Creek prior to lane widening, and replacement fiber cable was procured.

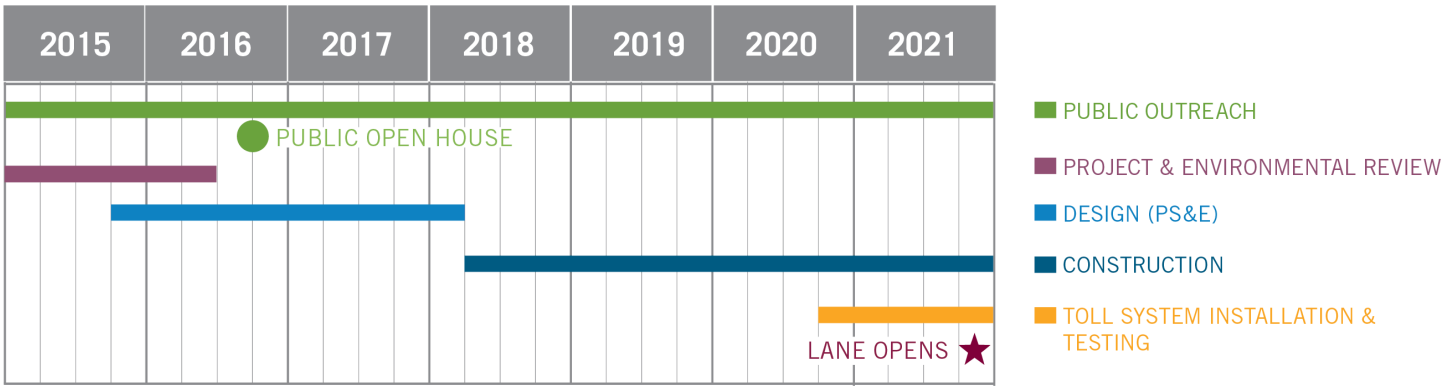
Current Project Activities

- The civil contractor will continue construction of the new median barrier between the Benicia-Martinez Bridge and SR-242. From south of SR-24 to Livorna Rd., the contractor will complete construction of the fiber optic conduit for the backhaul reroute.
- The replacement planting design continues to be updated to incorporate public feedback. Project staff is incorporating Caltrans' oversight of this work into the existing construction cooperative agreement between Caltrans and CCTA.

Current Project Activities (continued)

- The backhaul contractor will start to reroute in-use backhaul fiber in Walnut Creek in April 2019. Completion of the reroute requires focused coordination with the civil contractor, backhaul contractor and toll system integrator to minimize impact to I-680 Southern Segment express lanes operations. The integrator will disconnect and reconnect live toll equipment from the old to the new fiber with no planned disruption to I-680 Southern Segment express lanes operations.
- The toll system integrator has completed their submittal package for encroachment permits from Caltrans. Caltrans is finalizing the construction cooperative agreement with BAIFA for Caltrans' oversight services of the toll system integrator contract.

Project Schedule by Phase



Project Cost

Total Cost Estimate[1]	Cost Estimate, Funded Phases[2]	Regional Measure 2 Funds (allocated)	Other Funding (allocated)	BATA Express Lane Funds[3]			Percent Complete[4]
				July 2018 Amendment	Sept. 2018 Amendment	Expended as of 3/31/19	
127.4	127.4	19.4	54.3	51.3	53.6	7.1	30%

Costs shown in millions of escalated dollars.

The cost estimate for this project includes planning, design, construction, utilities, backhaul communications and toll system integration.

(1) Total Cost Estimate represents current estimated cost to complete each project.

(2) Cost Estimate, Funded Phases represents current estimated cost to complete phases that are funded for each project.

(3) BATA Express Lane Funds represent the funds that have been allocated from the BATA budget.

(4) Percent complete shown is based on the achievement of major milestones whether those milestones were completed using BAIFA funds or other funds.

Installing drainage on I-680 in Walnut Creek

Drilling an overhead sign foundation on I-680 in Concord

Extending PG&E service connections on I-680 in Concord

I-80 Solano (SOL-80)

Fairfield to Vacaville

Red Top Road to I-505

Total Cost Estimate

$228.2 million

Scheduled Open Date

End of 2021, subject to funding

Project Description

This project will convert the existing eastbound and westbound HOV lanes to express lanes between Red Top Road and Air Base Parkway in Fairfield. Conversion work includes striping lanes and installing sign gantries, signs, FasTrak® toll tag readers and traffic-monitoring video cameras.

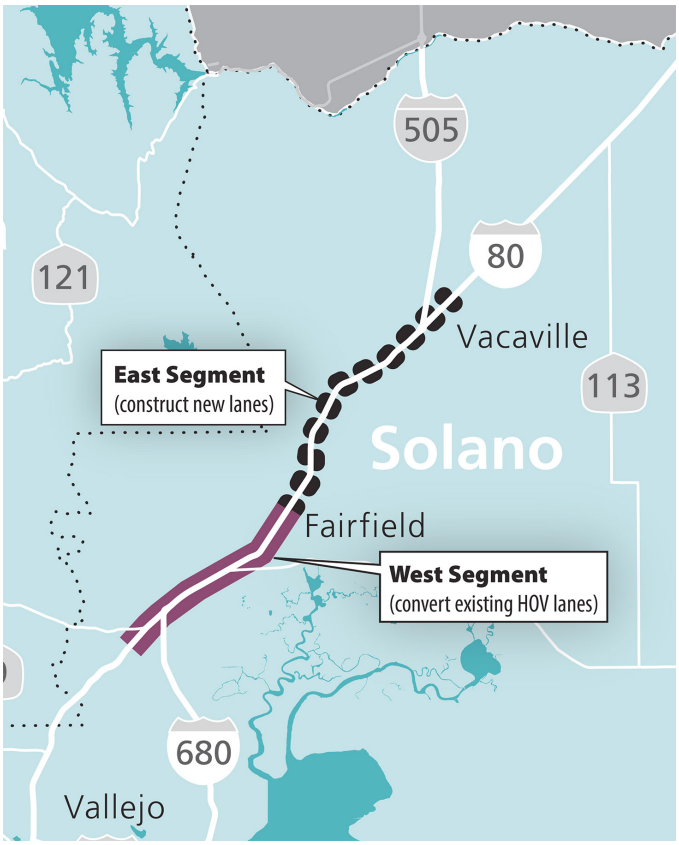
The project will also construct new eastbound and westbound lanes between Air Base Parkway and I-505 in Vacaville. In this section, the highway will be widened along with the installation of express lane striping, signage and equipment. The project will result in 36 miles of express lanes on I-80 in Solano County.

The Solano Transportation Authority (STA) is the lead agency for environmental clearance and civil design.

Caltrans will advertise and award the construction contract, and a blended Caltrans/STA team will administer construction. MTC will install toll and communications equipment and will operate the express lanes.

Project Highlights and Progress

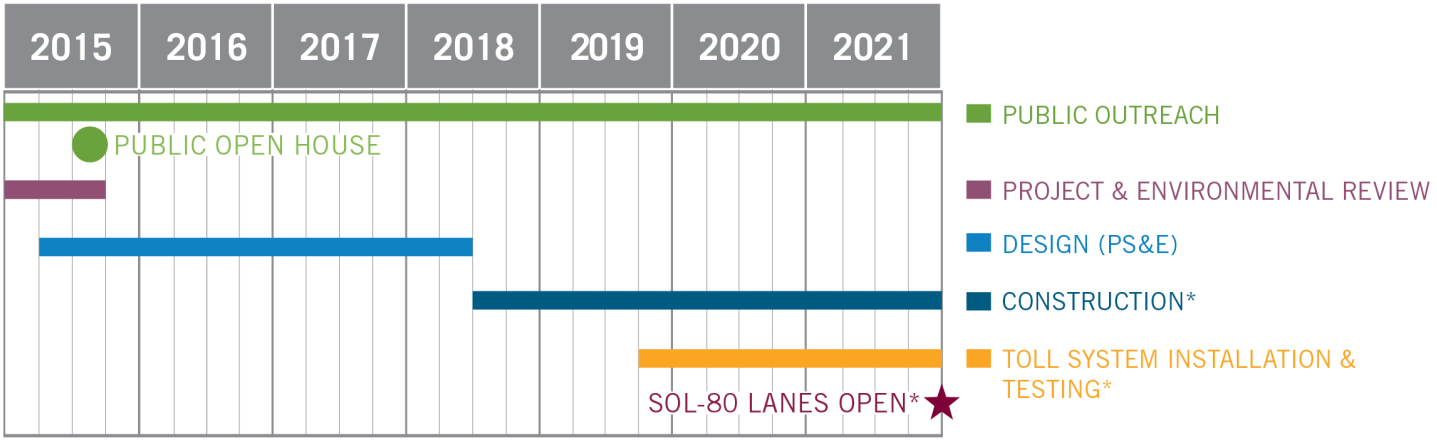
- A public open house was held in August 2015.
- The preliminary engineering report and environmental document were completed in December 2015.
- The final design document was approved by Caltrans in March 2018.
- The project reached the Ready-to-List milestone in April 2018.
- Caltrans submitted this project for a Federal INFRA grant in March 2019.



Current Project Activities

- The project is shelf-ready should construction funds become available.
- Caltrans, MTC and STA staff are waiting to learn if the project will receive an INFRA grant.
- MTC and STA staff continue to explore other potential funding sources.

Project Schedule by Phase



* Funding for these activities is not yet secured.

Project Cost

Total Cost Estimate[1]	Cost Estimate, Funded Phases[2]	Regional Measure 2 Funds (allocated)	Other Funding (allocated)	BATA Express Lane Funds[3]			Percent Complete[4]
				July 2018 Amendment	Sept. 2018 Amendment	Expended as of 3/31/19	
228.2	33.3	15.2		19.0	18.1	11.2	20%

Costs shown in millions of escalated dollars.

The cost estimate for this project includes planning, design, construction, utilities, backhaul communications and toll system integration.

(1) Total Cost Estimate represents current estimated cost to complete each project.

(2) Cost Estimate, Funded Phases represents current estimated cost to complete phases that are funded for each project.

(3) BATA Express Lane Funds represent the funds that have been allocated from the BATA budget.

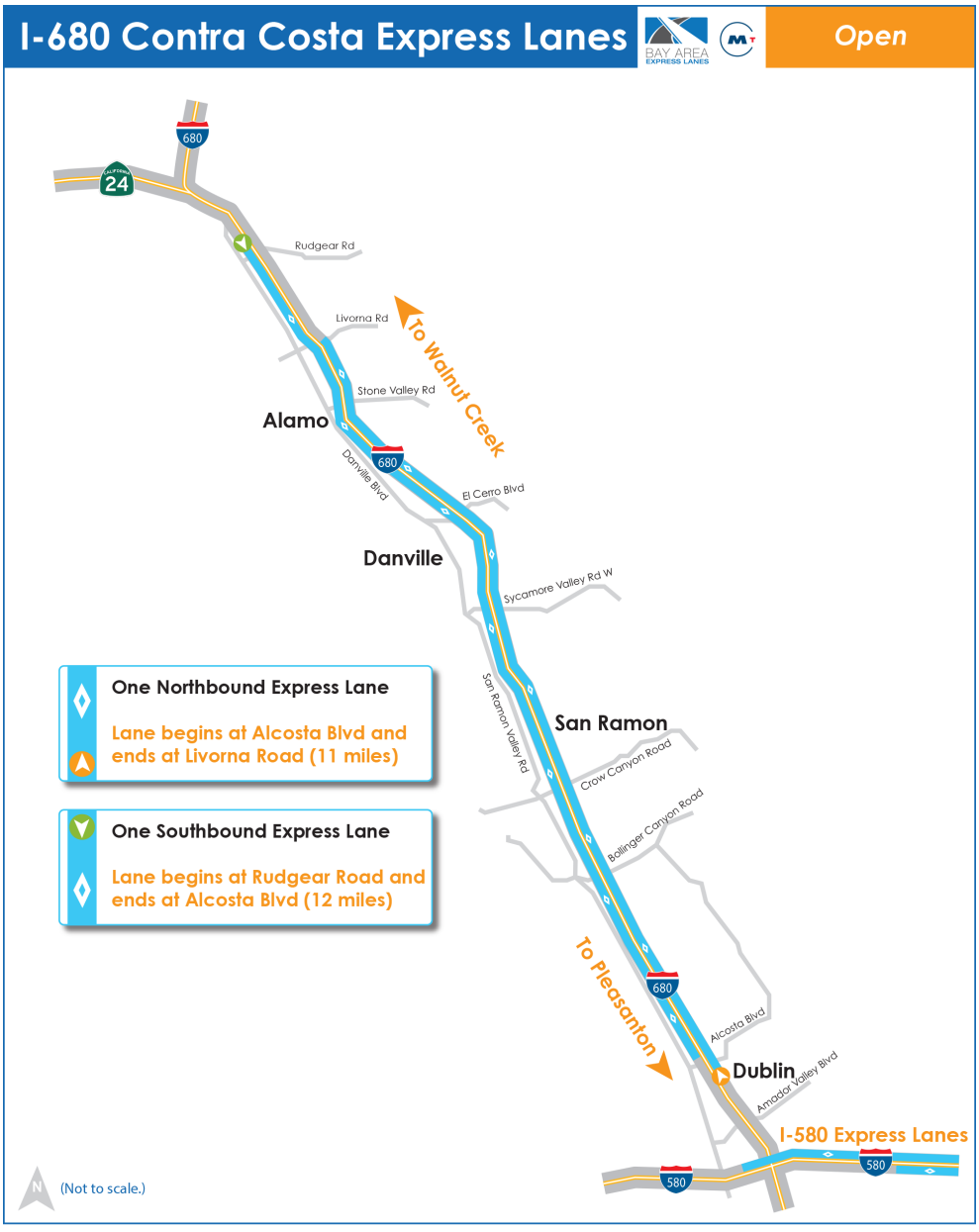
(4) Percent complete shown is based on the achievement of major milestones whether those milestones were completed using BAIFA funds or other funds.

IV. OPERATIONS

I-680 Contra Costa Express Lanes

The I-680 Contra Costa Express Lanes opened October 9, 2017. The lanes run 11 miles northbound from Alcosta Boulevard to Livorna Road and 12 miles southbound from Rudgear Road to Alcosta Boulevard. Regional Operations Center staff monitor equipment and lane performance, make toll rate adjustments, and coordinate with the California Highway Patrol (CHP) and Caltrans on incident management. The FasTrak® Customer Service Center issues toll tags, handles toll invoicing and collections, and provides customer service. Toll tag and vehicle occupancy requirements are enforced automatically by the toll system and manually by the CHP under contract to BAIFA. A 'backhaul' fiber network and supplemental leased-line services offer fast and secure transfer of tolling data. Roadway maintenance is also funded by the express lanes. Program and contractor staff perform public outreach and education, track and report on program performance and analyze traffic, and support operations in other ways as needed. Operating revenue and expenses are reported quarterly to BAIFA.

See **Appendix C** for a summary of this quarter's express lanes performance.



Rules of the Road

- Hours are Monday through Friday, 5 a.m. – 8 p.m.
- Tolls change based on traffic congestion; there is no maximum toll
- All vehicles in the express lane must use a FasTrak® or FasTrak Flex® toll tag
- Carpools of 2 or more people, eligible clean air vehicles, motorcycles and transit buses travel toll-free with a properly set FasTrak Flex® toll tag
- Learn more at expresslanes.511.org

APPENDICES

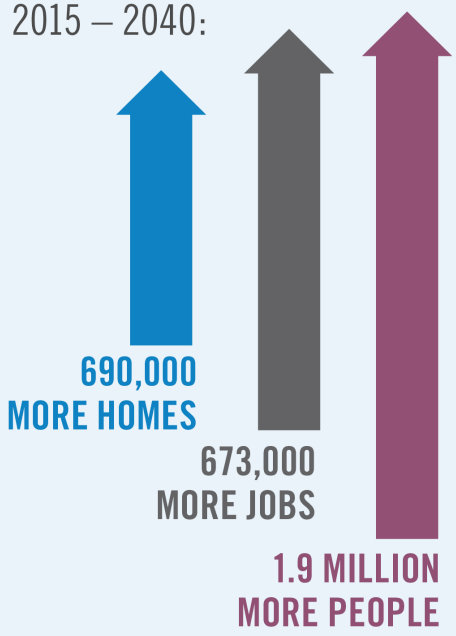
APPENDIX A

Express Lanes Overview

1. Why Express Lanes?

The Bay Area lacks the necessary transportation funding and land to build enough transportation capacity to keep up with regional growth. Bay Area Express Lanes maximize use of our highways by A) filling any empty space in existing HOV lanes, B) improving operations in existing HOV lanes through better carpool enforcement and strategies to prevent lane slowdowns, and C) filling gaps in the HOV lane system to encourage more carpooling.

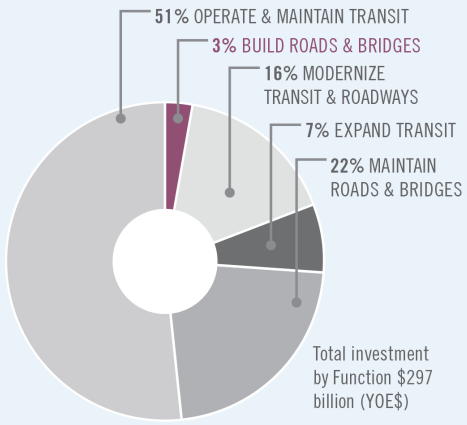
REGIONAL GROWTH 2015 – 2040:



Data Source: Plan Bay Area 2040 (2017).

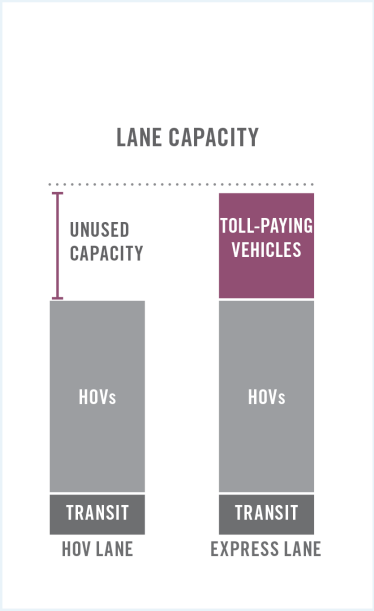
REGIONAL INVESTMENT BY 2040:

ONLY 3% OF THE REGION'S TRANSPORTATION DOLLARS WILL BE USED TO BUILD NEW ROADS.



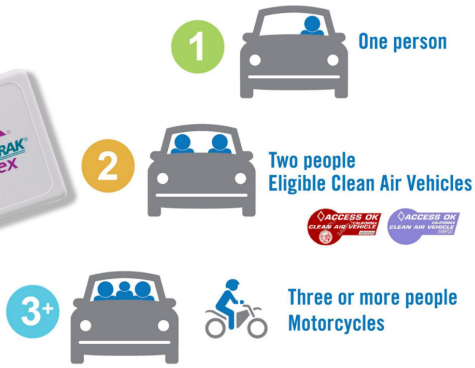
Data Source: Plan Bay Area 2040 (2017).

HOW EXPRESS LANES HELP:

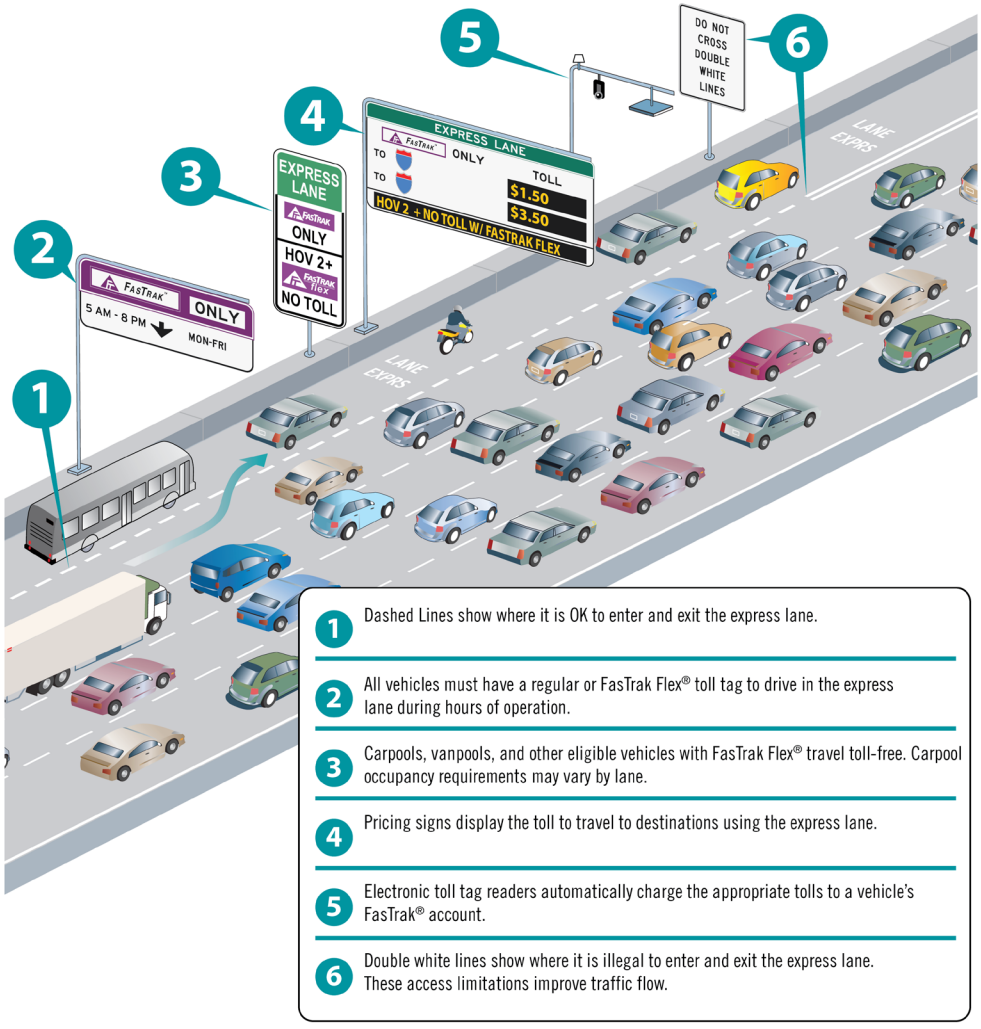


2. How Express Lanes Work

MTC Express Lanes are free to carpoolers, vanpoolers, motorcycles, eligible clean air vehicles and transit buses. Solo drivers can choose to pay tolls to use the lanes. Tolls for solo drivers will be collected electronically via FasTrak®, as on Bay Area toll bridges. Overhead electronic pricing signs will display the current toll rates, which will increase as traffic congestion increases and decrease as traffic congestion decreases.



On MTC Express Lanes, carpools, qualifying clean-air vehicles and other toll-exempt vehicles must use a FasTrak Flex® toll tag set to "2" or "3+" to travel toll-free. Solo drivers pay to use the lanes with either a standard FasTrak® toll tag or a FasTrak Flex® toll tag set to "1." Drivers should move the switch before driving.



1. Dashed Lines show where it is OK to enter and exit the express lane.
2. All vehicles must have a regular or FasTrak Flex® toll tag to drive in the express lane during hours of operation.
3. Carpools, vanpools, and other eligible vehicles with FasTrak Flex® travel toll-free. Carpool occupancy requirements may vary by lane.
4. Pricing signs display the toll to travel to destinations using the express lane.
5. Electronic toll tag readers automatically charge the appropriate tolls to a vehicle's FasTrak® account.
6. Double white lines show where it is illegal to enter and exit the express lane. These access limitations improve traffic flow.

The figure to the left explains how to use Bay Area Express Lanes. MTC Express Lanes will be mostly "open" access, meaning drivers will enter and exit the express lanes similar to how they enter and exit HOV lanes today. Areas in locations prone to excessive weaving or with safety issues will have limited access to restrict entry and exit at these locations. Signage and lane striping will identify the limited entry and exit locations. Limited access is a way to improve travel speeds in express lanes.

3. System Technology and Elements

MTC Express Lanes are implemented by overlaying communications equipment on new and existing freeway infrastructure. Express lanes implementation requires four discrete elements that are integrated through design, construction and operations, including:

Civil Infrastructure (Highway Modifications)

For lane conversions, the civil infrastructure consists of sign structures, sign panels, lane striping, and conduit work for power and communications. For gap closure and extension projects, the civil infrastructure includes highway widening to add lanes as well as the signage and communications equipment required for conversions.

The civil contractor will put in place the foundations and structures upon which the toll systems contractor will install the toll equipment. In addition, the civil contractor will construct the infrastructure necessary to provide power and communications to the toll system.

Toll System

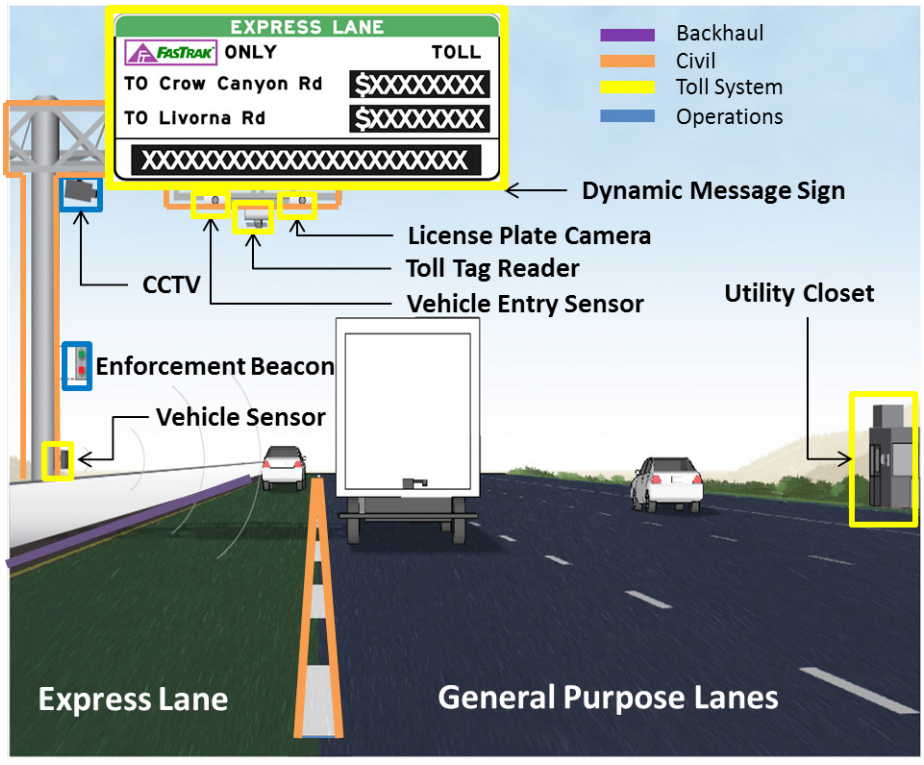
The toll system consists of two components, the in-lane system and the back-end "host" system. The lane system consists of all the equipment on the highway needed to operate the toll system including toll tag readers, cameras and vehicle detection. The host system serves as the brain of the toll system, which collects and processes all the data from the highway and sends it to the regional customer service center for billing.

Backhaul Communications Network

The backhaul network is the communication line along which data collected in the lanes is sent to the toll host system, operations center and regional customer service center. The backhaul contractor will install new conduit and communications fiber as well as utilize existing Caltrans, BART and other infrastructure to build the network. The backhaul network is being designed with the expectation that it will become part of a broader regional communications network.

Operations

The operations element consists of everything that is needed to successfully operate the express lanes including: an operations center, the regional customer service center, enforcement, public outreach, performance monitoring and ongoing maintenance. An express lanes Regional Operations Center will be established in the Bay Area Metrocenter building in San Francisco where operators will actively monitor the condition of the lanes and coordinate with Caltrans and the California Highway Patrol to ensure that the lanes operate efficiently.



For illustrative purposes only

APPENDIX B

Completed Capital Project Summaries

I-680 Contra Costa Southern Segment (CC-680 South)

Walnut Creek to San Ramon

Livorna Road/Rudgear Road to Alcosta Boulevard

Total Program Estimate

$55.6 million

Open Date

Fall 2017

Project Description

The project converts existing HOV lanes to express lanes on I-680 from Rudgear Road to Alcosta Boulevard in the southbound direction and from Alcosta Boulevard to Livorna Road in the northbound direction. It will result in 23 express lane miles through San Ramon, Danville, Alamo and southern Walnut Creek. No widening or additional lanes will be added to the freeway.

This conversion project includes striping lanes and installing sign gantries, signs, FasTrak® toll tag readers, and traffic monitoring video cameras. In addition, the project installs equipment and observation areas to help the California Highway Patrol enforce proper use of the lanes.

Project Highlights and Progress

- Public open house was held in March 2014.
- Preliminary engineering report and environmental document were completed in August 2014.
- Final design for both the backhaul communication network and the toll system were completed in December 2015.
- Final roadway design was completed in April 2015. Civil construction was completed in May 2017.
- Backhaul contractor completed installation of 26 miles of fiber optic cable in June 2017.
- Corridor Testing was completed in August 2017.
- Toll system equipment and software was finalized and tested in September 2017.

- Backhaul operations and maintenance started in October 2017.
- The toll system went live to the public on October 9, 2017.

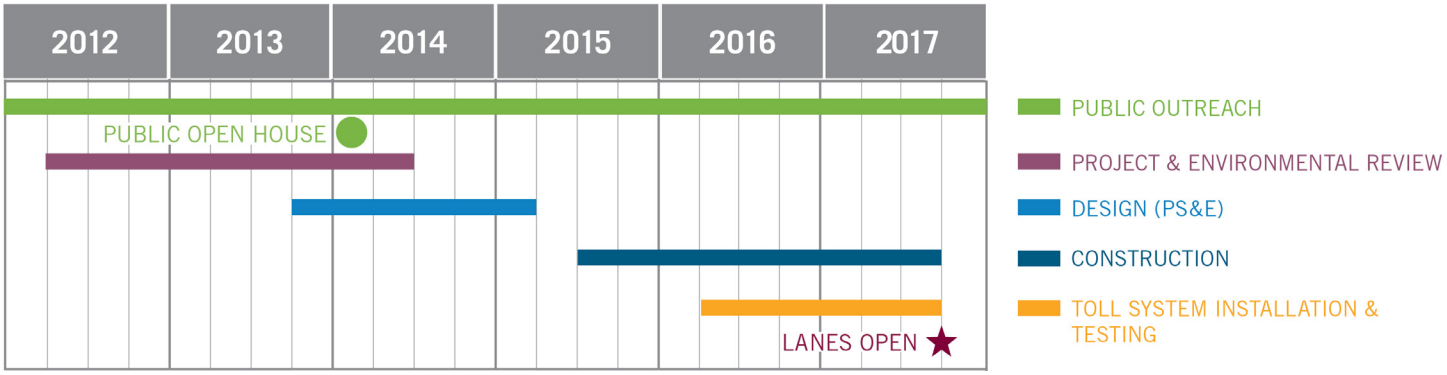
Current Project Activities

- The integrator is fine tuning field equipment and addressing punch list items in preparation for Operations Testing in summer of 2018. This test verifies the toll system meets all specifications and leads to the maintenance phase of operations.
- The Backhaul contractor completed project 'as-built' documentation and is performing ongoing operations of the communications network.
- Beginning in this Quarterly Report, since civil construction is complete and the express lanes are open, this capital project will be archived in Appendix B and no further updates will be made to the project summary.

I-680 Contra Costa Express Lanes regulatory sign.

Photos courtesy of Noah Berger.

Project Schedule by Phase



Project Cost

Program Estimate[1]	Cost Forecast[2]	Regional Measure 2 Funds (allocated)	BATA Express Lane Funds[3]			Physical % Complete[4]
			Dec. 2015 Amendment	June 2017 Amendment	Expended through 3/31/18	
55.6	55.6		55.6	55.6	49.7	98%

Costs shown in millions of escalated dollars.

The program estimate for this project includes planning, design, construction, utilities, backhaul communications and toll system integration.

(1) Program estimate represents current estimated cost to complete each project.

(2) Cost forecast represents current estimated cost to complete phases that are funded for each project.

(3) BATA Express Lane Funds represent the funds that have been allocated from the BATA budget.

(4) Physical percent complete shown is based on the achievement of major milestones whether those milestones were completed using BAIFA funds or other funds.

APPENDIX C

I-680 Contra Costa Express Lanes Operations Report

I-680 Contra Costa Express Lanes Performance
1st Quarter 2019 - January - March

Bay Area Infrastructure Financing Authority

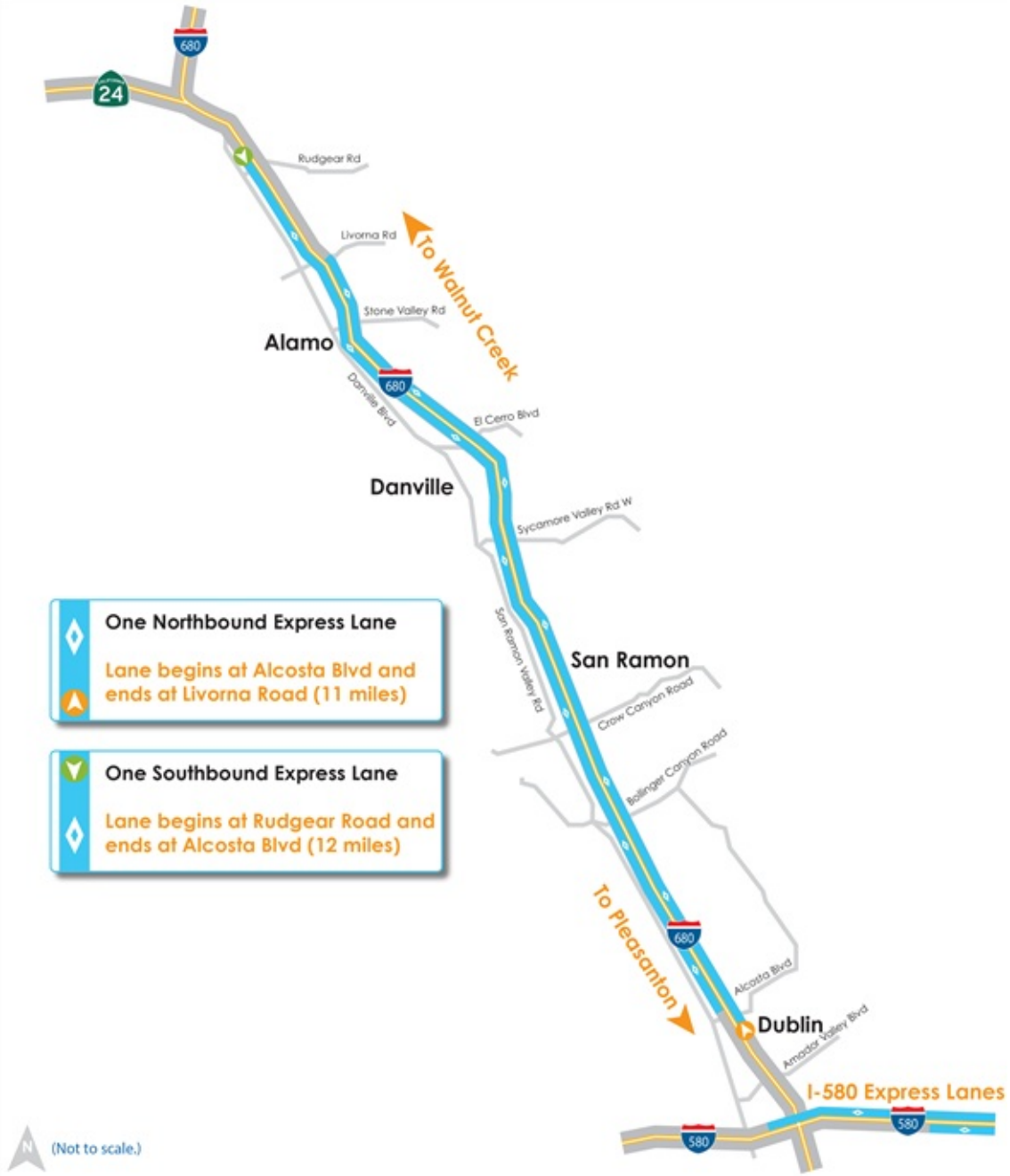
Submitted May 2019

BAY AREA EXPRESS LANES

METROPOLITAN TRANSPORTATION COMMISSION

Rules of the Road

- Hours: 5 a.m. to 8 p.m. Monday - Friday
- FasTrak® required
- Carpools (2+), clean-air vehicles & motorcycles toll-free with FasTrak Flex®



Summary of Performance Highlights

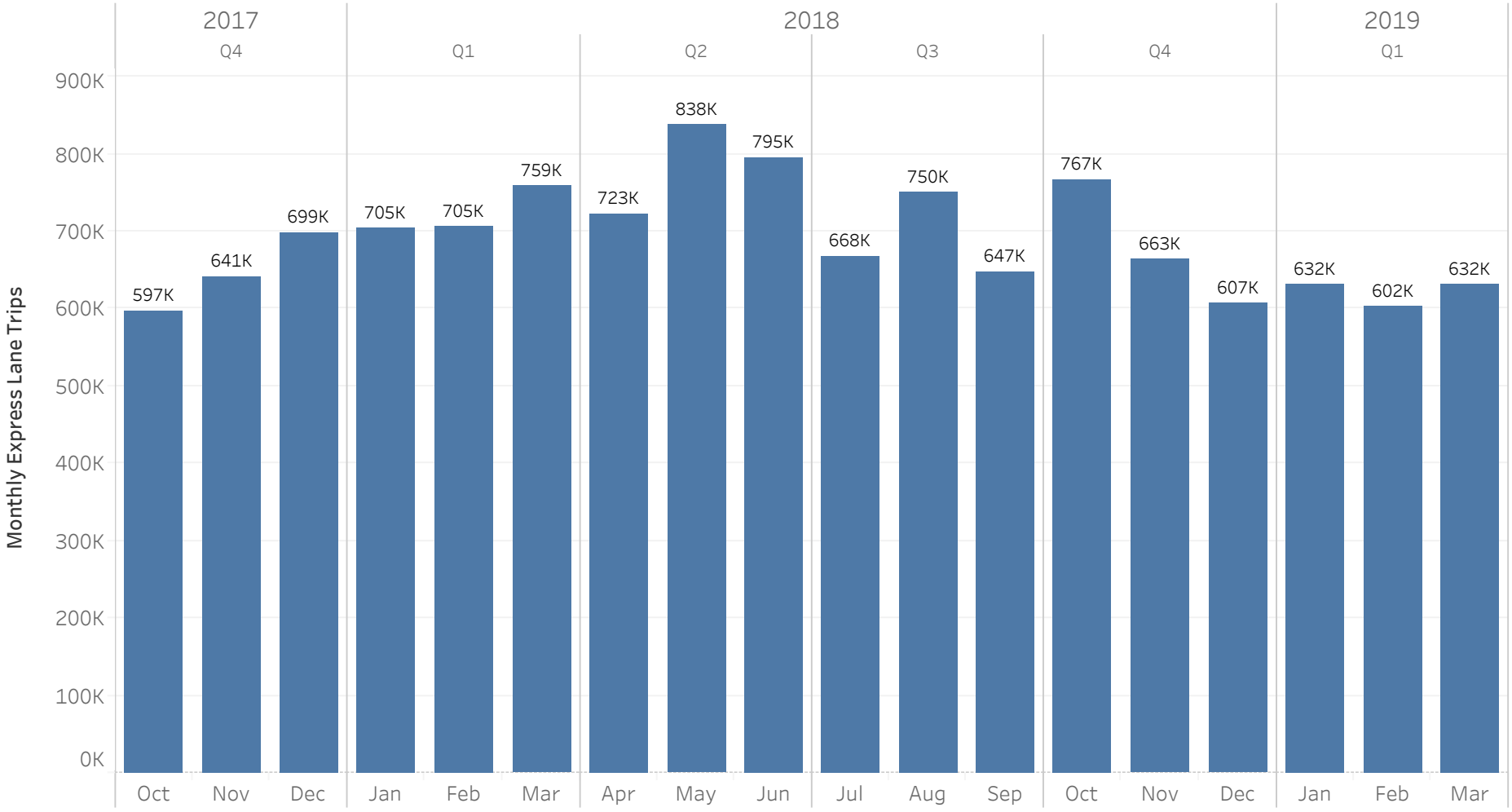
- Express lane trips decreased 14% to 1.9 million in Q1 2019 from 2.2 million in Q1 2018. Average daily express lane trips were 29,000 compared to 34,000 in Q1 2018.
- Peak period express lane speeds were 9 to 13 miles per hour faster than the general purpose lanes, and express lane speeds were mostly higher compared to Q1 2018.
- The decrease in trips in the lanes (and resulting increase in speeds) is due to an overall decline in vehicle miles traveled in the corridor (4% northbound; 2% southbound) and an increase in the average tolls paid by lane users. Year-over-year declinces in VMT were also observed in other Bay Area highway corridors, including US-101 (11% NB) I-280 (5% NB & SB) and I-880 (2% NB & 1% SB).
- In March 2019, 41% of trips were by vehicles declared as toll-free. This percentage had been trending up from about 30% when the lanes first opened to 43% in Q4 2018. Q1 2019 reversed this trend with a slight decline. Toll violators, which are vehicles without FasTrak® accounts, represented just 4% of all trips.
- Average peak hour tolls paid were similar from month to month in the quarter, ranging from $5.10 to $5.50 for both the northbound p.m. and southbound a.m. peak hours. In the middle of the day, it was less than $1.00.

- The highest posted toll to travel the entire corridor during the quarter was the same as last quarter at $8.50. It was reached in the a.m. and p.m. peak periods in both directions and was paid by only 5% of tolled drivers.
- Peak period tolls have increased over time to manage express lane demand. Tolls are increasing earlier to prevent congestion from building up and the lanes from breaking down. As a result, average tolls paid in Q1 2019 were higher than in Q1 2018; ranging from 18% higher in the northbound p.m. peak to 83% higher in the southbound a.m. peak.

Express Lane Trips

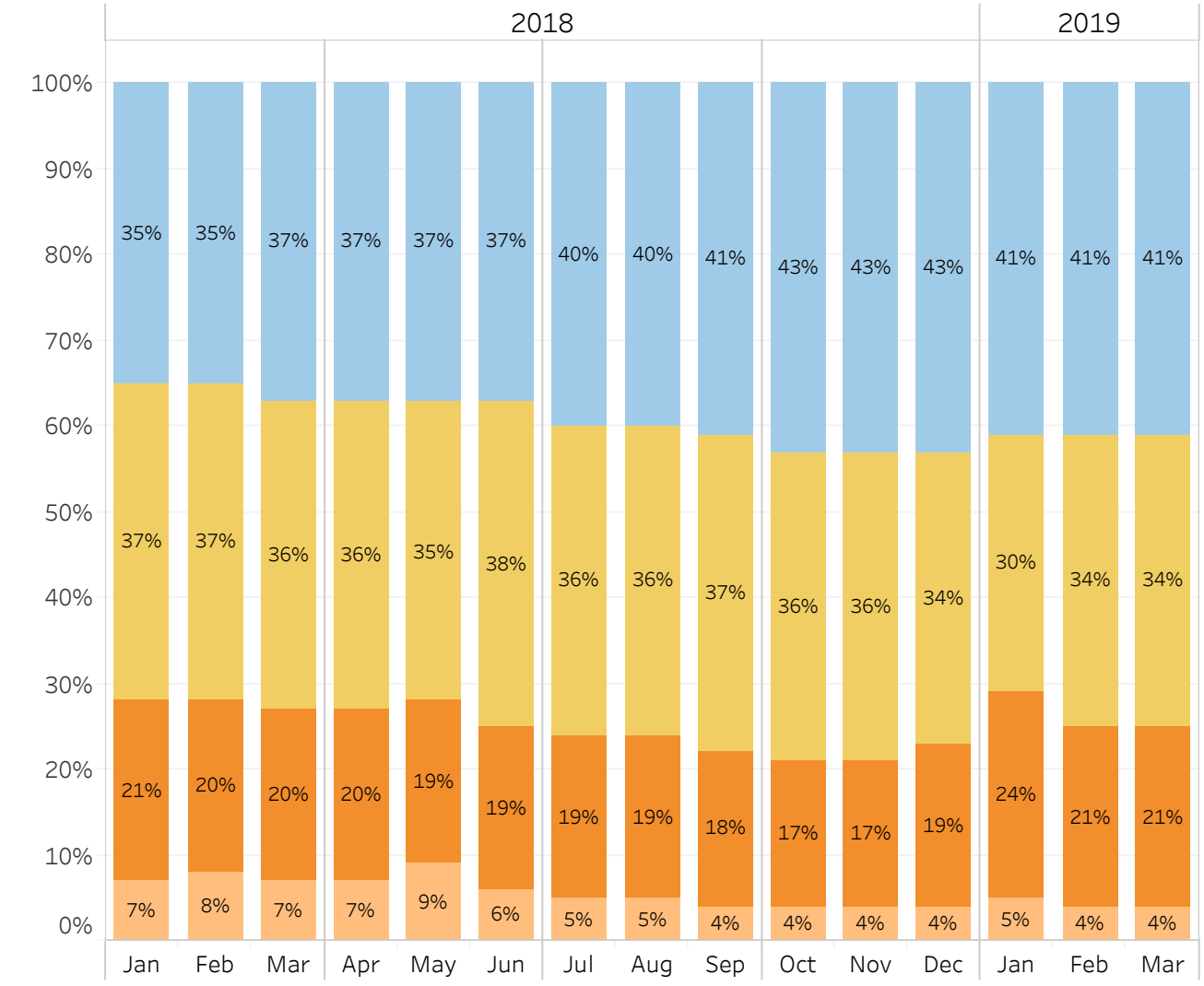
Over 12.4 million trips have been taken in the express lanes since opening. In Q1 2019 there were 1.9 million trips taken, down from 2.2 million in Q1 2018. Average daily trips were 29,000 compared to 34,000 in Q1 2018 and 33,000 for all months since opening.

The decline in express lane trips can be partly attributed to declining average daily vehicle miles traveled (VMT) in the corridor between Q1 2018 and Q1 2019. VMT fell 4% northbound and 2% southbound. Another explanatory factor is that the toll algorithm more pro-actively managed traffic flow in Q1 2019.



Includes toll-free trips, tolled trips and violation trips taken during express lane hours.

Express Lane Trip Types



- The share of vehicles traveling toll-free as carpools, clean air vehicles, etc. had been increasing since opening until Q1 2019 when the percentage fell from 43% in Q4 2018 to 41% in Q1 2019.

- The share of vehicles traveling as toll-paying customers was about 55% of all users in Q1 2019, up from 53% in Q4 2018.

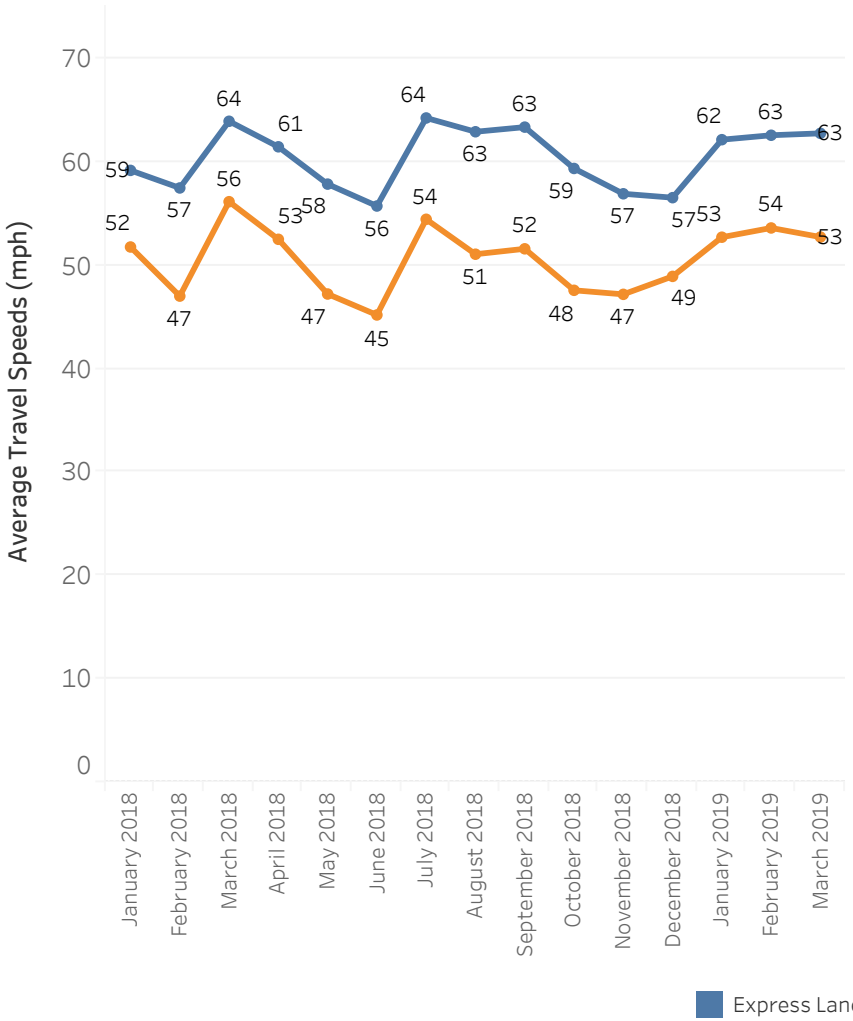
- The share of vehicles without a FasTrak® toll tag or account (toll violators) held steady at about 4% in Q1 2019.

Percentages of SOVs and HOVs are based on toll tag settings read by the toll system.

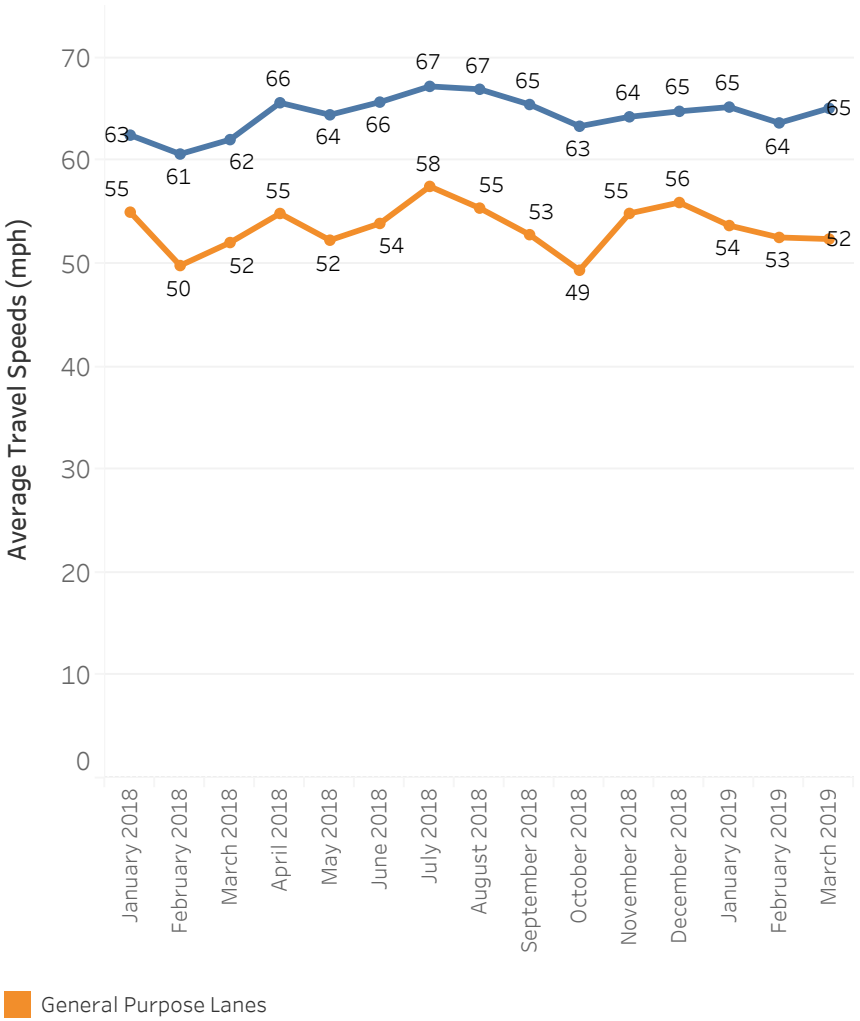
Peak Hour Traffic Speeds

Speeds in the northbound and southbound express lanes average 10 and 11 miles per hour faster, respectively, than those in the general purpose lanes. Express lane speeds, as well as the speed differtial between the express lanes and the general purpose lanes, were generally higher in Q1 2019 than in Q1 2018, which is likely due to decreased vehicle trips in the express lanes.

Northbound P.M. Peak Hour (5 - 6pm)



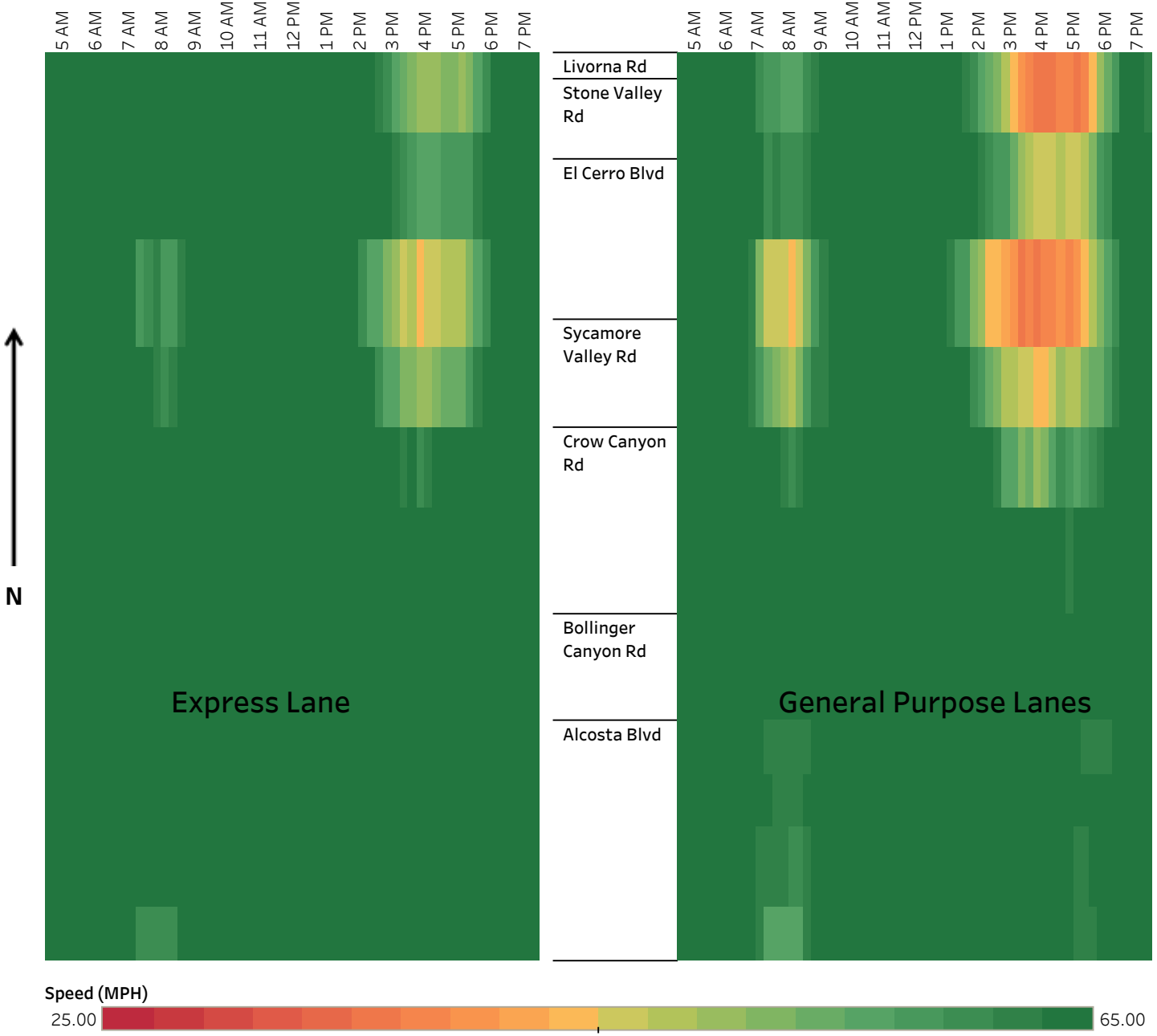
Southbound A.M. Peak Hour (8 - 9am)



Express Lane General Purpose Lanes

Speeds are averaged over the distance of the express lane. Peak hours are defined as the hours with lowest average corridor speeds across all lanes.

Northbound Corridor Speed Q1 2019

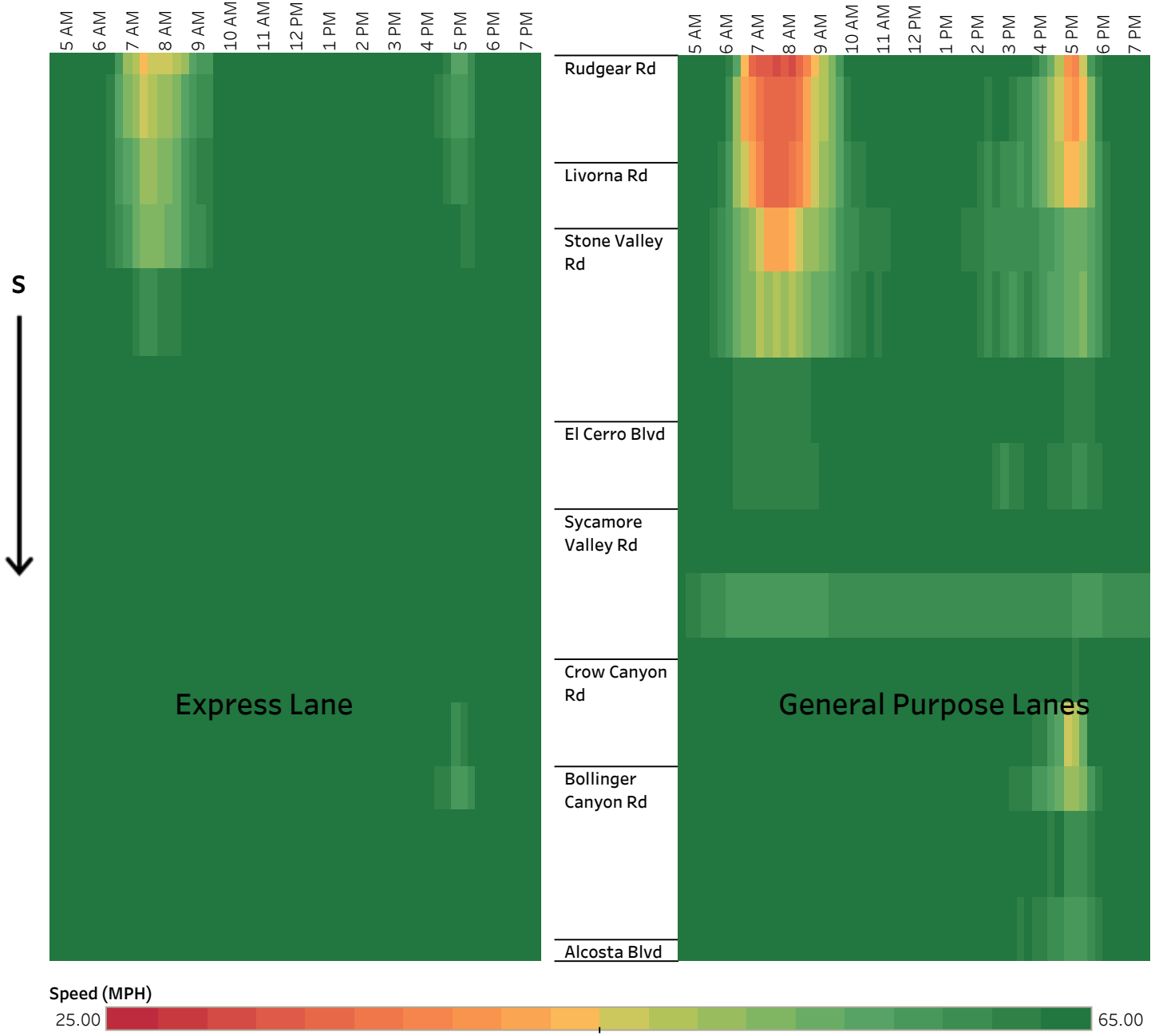


Congestion originating north of the express lane regularly caused slowdowns in the general purpose lanes in the p.m. peak.

In congested areas express lane users traveled faster than general purpose lanes users in the peak hour by an average of 9 mph in January, 9 mph in February, and 10 mph in March .

Traffic flowed well in all lanes during the middle of the day, 10 a.m. to 1 p.m.

Southbound Corridor Speed Q1 2019



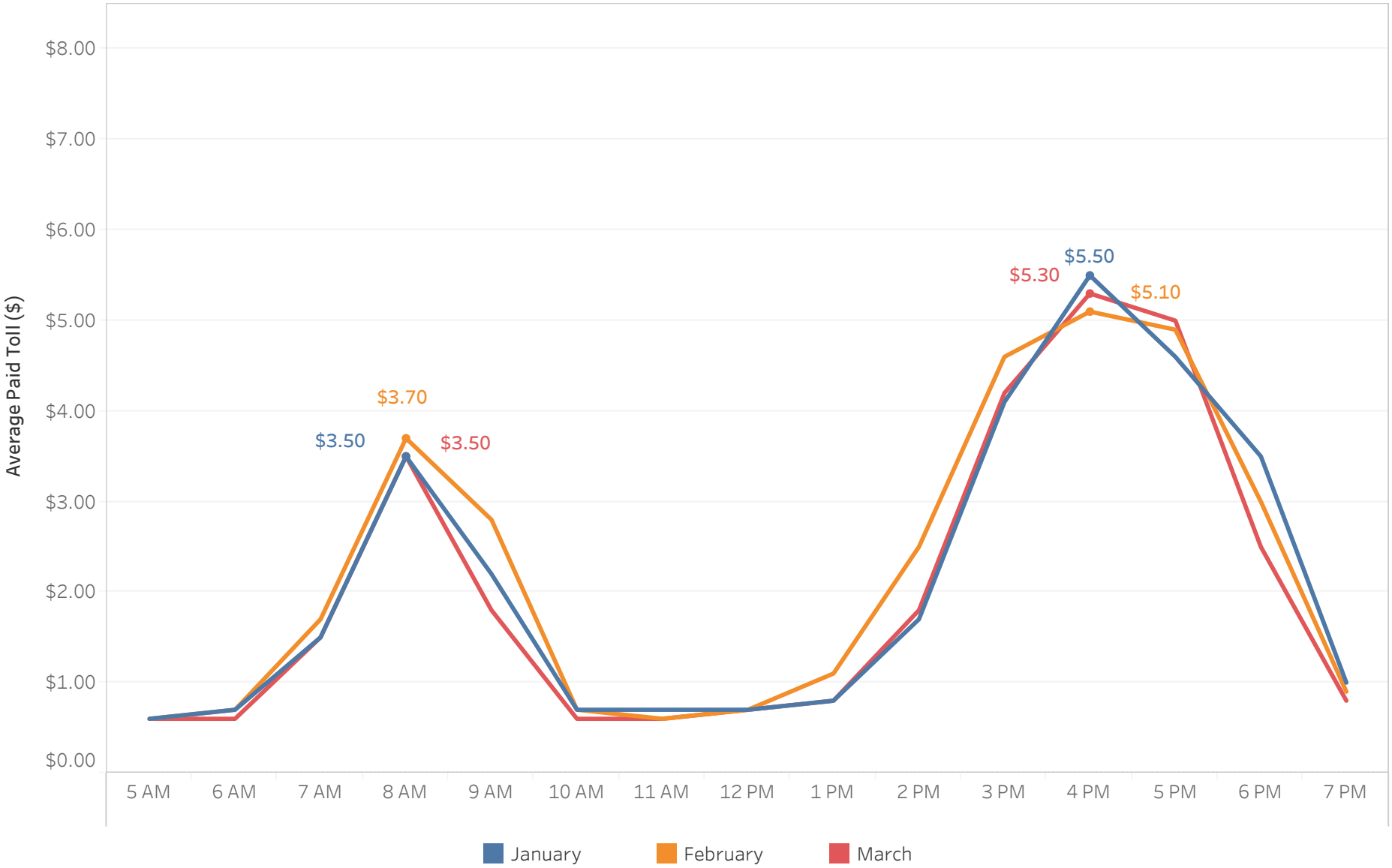
Slowdowns regularly occurred in the general purpose lanes between Rudgear Rd. and El Cerro Blvd. in both the a.m. and p.m. peak periods, and to a lesser extent between Crow Canyon Rd. and Bollinger Canyon Rd. in the p.m. peak

Express lanes users traveled faster during these slowdowns than general purpose lane users by an average of 11 mph in January, 11 mph in February, and 13 mph in March.

Traffic flowed well in all lanes during the middle of the day, 10 a.m. to 1 p.m.

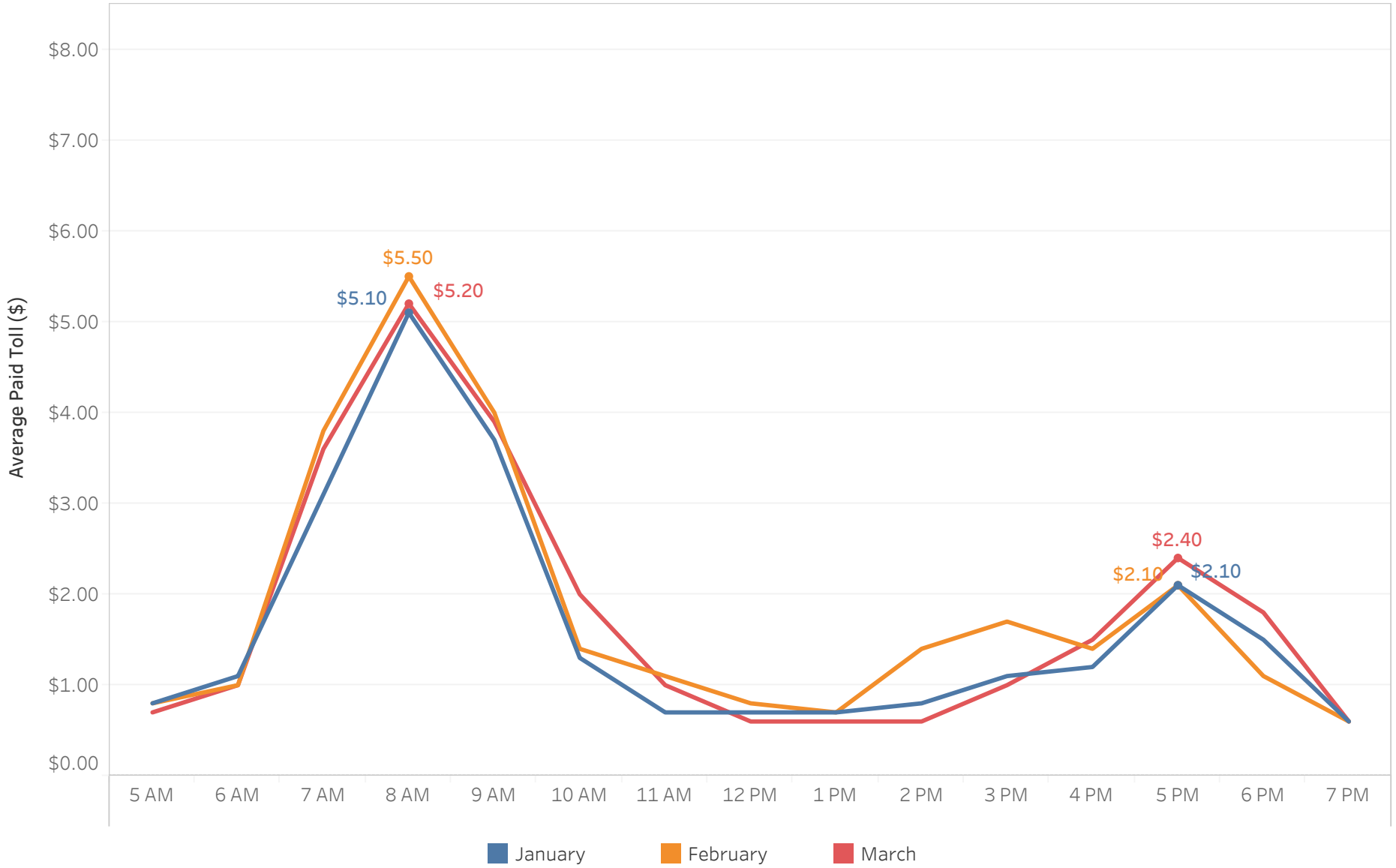
Northbound Tolls Q1 2019

The graph below shows the average toll paid by time of day for the northbound direction. The highest toll posted to travel the entire corridor was $8.50.



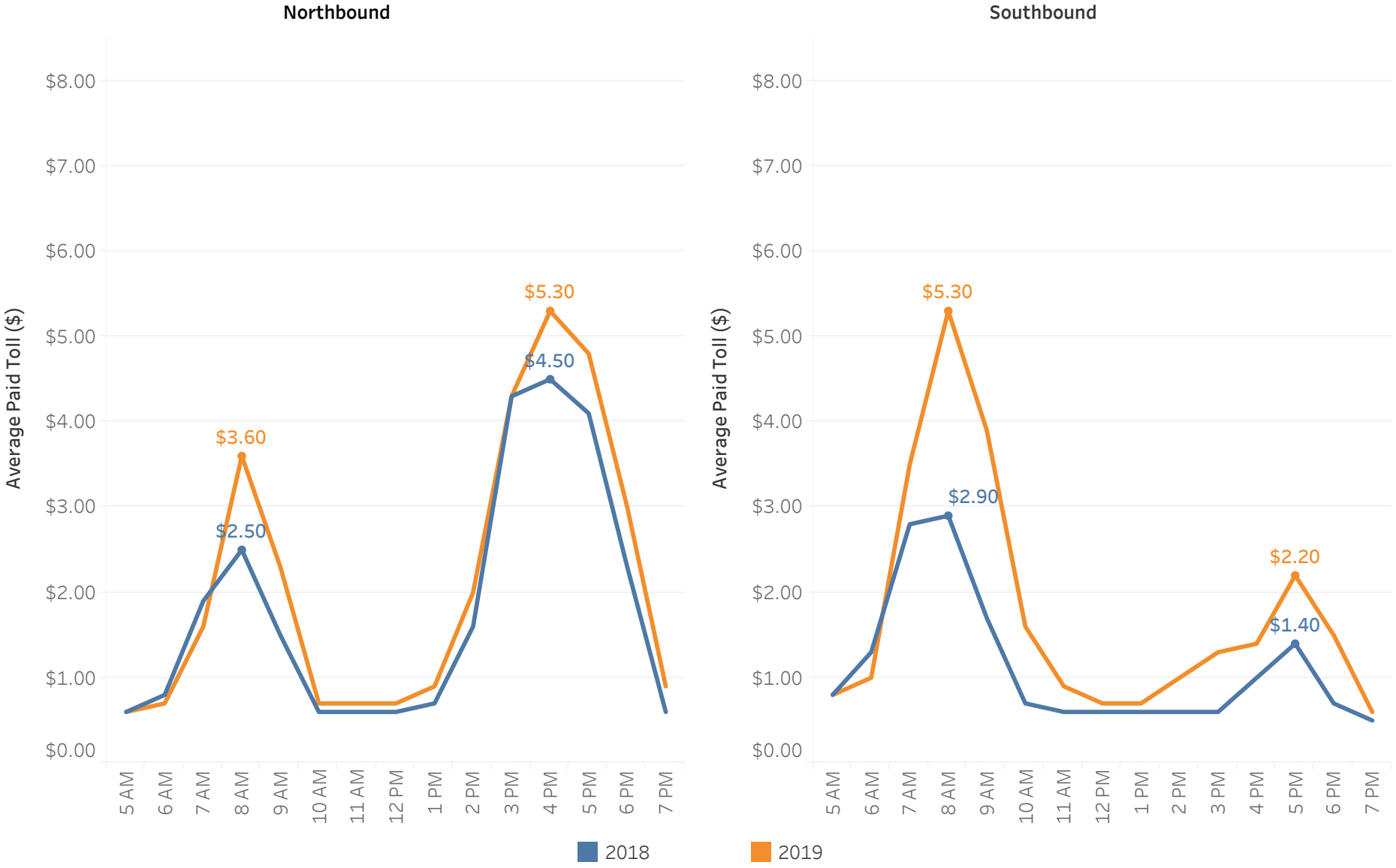
Southbound Tolls Q1 2019

The graph below shows the average toll paid by time of day for the northbound direction. The highest toll posted to travel the entire corridor was $8.50.



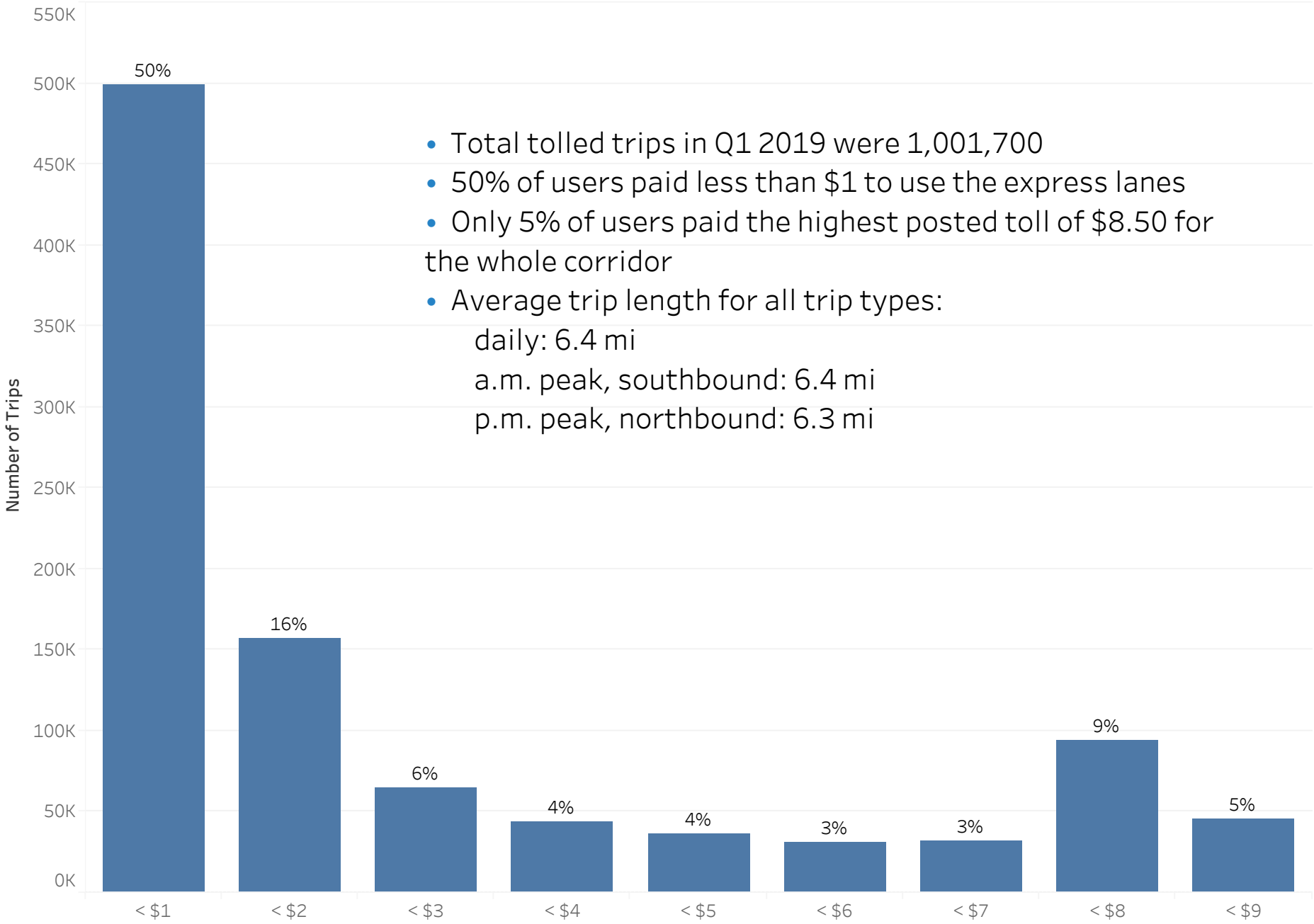
Average Tolls Paid - Q1 2018 & Q1 2019

To ensure express lane reliability and prevent the lanes from slowing down, the toll algorithm more pro-actively managed demand in 2019. Average tolls paid were as much as $2.40 higher in Q1 2019 than in Q1 2018. The higher tolls were a contributing factor to the decline in average daily express lanes trips between Q1 2018 and Q1 2019.



BAY AREA EXPRESS LANES

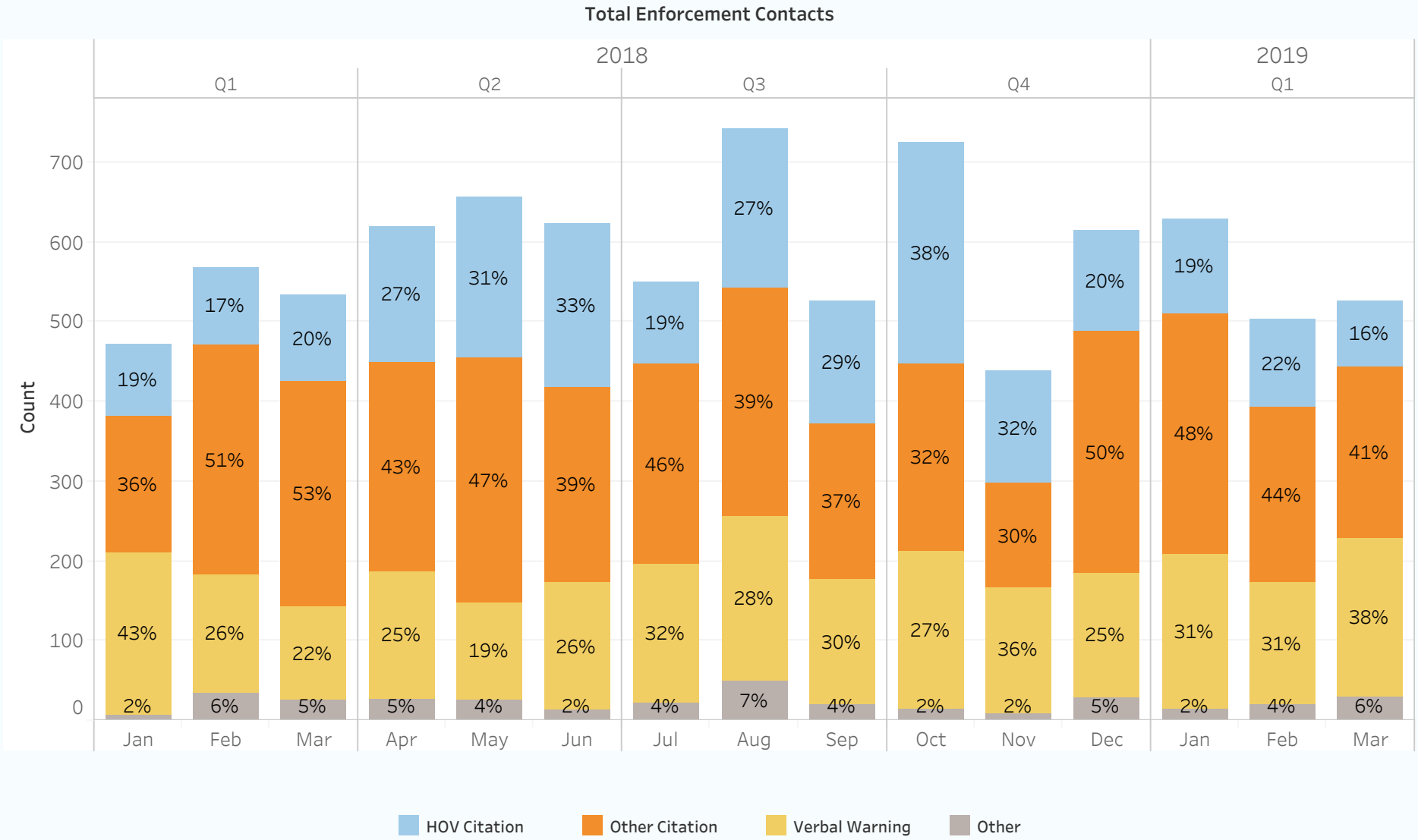
Toll Distribution Q1 2019



- Total tolled trips in Q1 2019 were 1,001,700
- 50% of users paid less than $1 to use the express lanes
- Only 5% of users paid the highest posted toll of $8.50 for the whole corridor
- Average trip length for all trip types:
  - daily: 6.4 mi
  - a.m. peak, southbound: 6.4 mi
  - p.m. peak, northbound: 6.3 mi

CHP Enforcement

CHP made about 1,660 enforcement contacts in Q1 2019, 19% of which resulted in citations for HOV occupancy violations. CHP filled 94% of 1,260 requested hours of enforcement in Q1 2019.



For more information, go to: mtc.ca.gov/express-lanes