



BAY AREA TOLL AUTHORITY

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Memorandum

TO: BATA Oversight Committee

DATE: November 7, 2018

FR: Executive Director

W. I. 1252

RE: Options for Implementing All-Electronic Tolling on State-Owned Bridges

The Bay Area Toll Authority along with Caltrans, operates a mix of cash and electronic toll collection lanes at the seven state-owned toll bridges in the Bay Area. This memorandum describes research conducted by BATA staff about the feasibility of All-Electronic Tolling (AET) to improve tolling operations, and sets forth staff's view on the next steps which could be taken toward conversion of any or all of the seven state-owned bridges.

Background

In 2015, BATA contracted with Jacobs Engineering Group (Jacobs) to identify whether AET could be expanded to the seven state-owned toll bridges to achieve regional consistency and improve safety and efficiency at the point of toll collection. The extent of their scope of work consisted of: (1) performing a detailed financial analysis to assess future revenue collection within an AET environment; (2) conducting a traffic study to forecast future travel times and emission savings; (3) developing customer service strategies; and (4) analyzing the Golden Gate Bridge, Highway and Transportation District (GGB) AET conversion. Observations and lessons learned from the March 2013 GGB AET implementation include:

- Impacts on staffing, payment processing, mailing, call center performance and customer satisfaction at the Regional Customer Service Center (RCSC) were significant;
- Toll collector downsizing consisted of retirements, transfers and educational assistance;
- Traffic volume and revenue was unchanged, with an increase in toll tag usage; and
- Conversion of toll plaza operations resulted in higher speeds through the toll plaza.

Benefits and Challenges

The primary benefits deployers of AET nationwide have achieved include:

- Increased driver and collector safety by reducing accidents and eliminating robberies;
- Decreased vehicle delay by increasing vehicle throughput and relieving the need to merge;
- Reduced emissions because less vehicles will be stationary with engines running; and
- Expanded flexibility to manage congestion if toll booths are removed, such as the future ability to institute bi-directional tolling.

The primary challenges BATA would encounter when implementing AET include:

- Human Resources at Caltrans must diligently complete the labor re-allocation process to provide toll collectors new skills training and placement into alternate positions.
- The RCSC will require numerous upgrades to its systems, including: changes to business rules and payment processing systems, and hiring more customer service representatives.

- The RCSC will substantially increase its workload with many former cash payers becoming invoice paying customers, thereby causing collection costs to also increase.
- A shift in customer behavior is necessary, and significant resources will need to be dedicated to public outreach, to encourage former cash payers to convert to FasTrak® users.

Implementation Considerations

AET can be implemented leaving toll booths intact, or booths can be removed and new gantries installed over the freeway instead (i.e. Open Road Tolling (ORT), which we have now at a portion of the Benicia plaza). ORT requires the procurement of a new tolling system and reducing the number of toll lanes by half (although not negatively impacting total vehicle throughput). ORT requires an initial capital investment of \$32 million more than AET, but results in about \$5 million annual savings in operating costs. Descriptions of the options are shown in the table below, with more detailed information within Attachment A.

Option	Description	1 st Conversion	Capital Cost	FY 24-25 Operating Cost
AET	<ul style="list-style-type: none">• Stop manual tolling• Retain toll booths	Spring 2021	\$23 million	\$76 - \$80 million
AET/ORT	<ul style="list-style-type: none">• Stop manual tolling• Remove booths/canopies, install gantries	Summer 2022	\$55 million	\$71 to \$75 million
No change	<ul style="list-style-type: none">• Continue manual tolling	N/A	N/A	\$82 million

Both options result in more efficient tolling, increased safety, decreased vehicle delay, and lower vehicle emissions. Changing tolling operations to AET or ORT would result in the following benefits at the seven State-owned toll bridges:

- Elimination of toll collector robberies, which primarily occur at the Carquinez Bridge;
- Reduced vehicle delay (3-7 minutes) within the peak period at the Dumbarton, Richmond-San Rafael, San Francisco-Oakland Bay Bridge and San Mateo-Hayward Bridge corridors;
- Fewer vehicle accidents due to reduced need for vehicle weaving and merging, especially under the ORT option;
- Reduced peak period vehicle emissions (approximately 8% lower); and
- Removing toll booths/plazas allows for greater flexibility to manage congestion by enabling smart metering lights, congestion pricing, and other congestion management projects.

Next Steps

Staff believes the AET/ORT option achieves the highest level of safety and reduction in vehicle delay. The financial case for converting to AET is less compelling, and could be close to a “wash”. A successful conversion will require supporting the transition of affected Caltrans employees, planning for increased workload at the RCSC, and investing substantial capital funds and staff resources toward project development. We look forward to your discussion and direction at the meeting next week.



Steve Heminger

SH:jg
Attachment

Attachment A

Detailed Information of Options 1-3

This attachment describes each of the options in more detail to clarify how infrastructure and tolling equipment would be impacted, along with the breakdown of capital and operating costs. All costs shown below are estimates.

Option #1 – All Electronic Tolling

Description: Manual toll collection stopped with few changes to roadway equipment or infrastructure.

Toll Plaza Infrastructure: Toll plaza canopies and booths remain in place. Additional electronic and fixed signage needed to inform drivers about upcoming tolling point.

Toll System Modifications: In-lane equipment remain unchanged within 71 lanes. Server room equipment, including servers and lane controllers, upgraded due to reaching end of life.

Travel Time Improvements: Traffic eliminated at three eastern bridges, while the four western bridges see varying reductions in delay.

Schedule: First plaza, potentially the Carquinez Bridge plaza, could be completed as early as Spring 2021.

Cost Centers	Civil Cost	Cost Centers	FY 24-25 Operating Cost
Collector Training	\$1.5M	Caltrans Toll Staff	\$0
Consultant Support	\$3.5M	RCSC	\$35.5M to \$39.5M
Public Relations	\$5.0M	Credit Card Fees	\$14.7M
Civil	\$2.0M	Tag Purchases	\$15.6M
RCSC	\$2.5M	Tolling System	\$5.1M
Tolling System	\$6.0M	Toll Facilities	\$5.0M
Contingency	\$2.5M		
Total Capital Costs	\$23M	Yearly Operating Costs	\$76M to \$80M

Option #2 – Open Road Tolling

Description: Manual toll collection stopped with major roadway infrastructure changes to remove obstacles which may be struck by vehicles, making this the safest option of the three.

Toll Plaza Infrastructure: All toll booths and at least four toll canopies are demolished and replaced with overhead gantries. Electronic and fixed signage need to be purchased and installed.

Toll System Modifications: New tolling system procured and installed on newly constructed gantries or existing canopies. Reduction in total number of lanes from 71 to approximately 40.

Travel Time Improvements: Marginal improvement compared with AET.

Schedule: First plaza, potentially the Carquinez Bridge plaza, could be completed by Summer 2022.

Cost Centers	Civil Cost	Cost Centers	FY 24-25 Operating Cost
Collector Training	\$1.5M	Caltrans Toll Staff	\$0
Consultant Support	\$4.0M	RCSC	\$35.5M to \$39.5M
Public Relations	\$5.0M	Credit Card Fees	\$14.7M
Civil	\$21.0M	Tag Purchases	\$15.6M
RCSC	\$2.5M	Tolling System	\$2.8M
Tolling System	\$14.0M	Toll Facilities	\$2.5M
Contingency	\$6.5M		
Total Capital Costs	\$55M	Yearly Operating Costs	\$71M to \$75M

Option #3 – No Change

Description: Tolling Operations remains unchanged, with tolls collected manually and electronically.

Toll Plaza Infrastructure: No change.

Toll System Modifications: No change. Server room equipment upgraded, separate from AET.

Travel Time Improvements: If traffic volume continues to increase, travel times will also increase.

Schedule: None

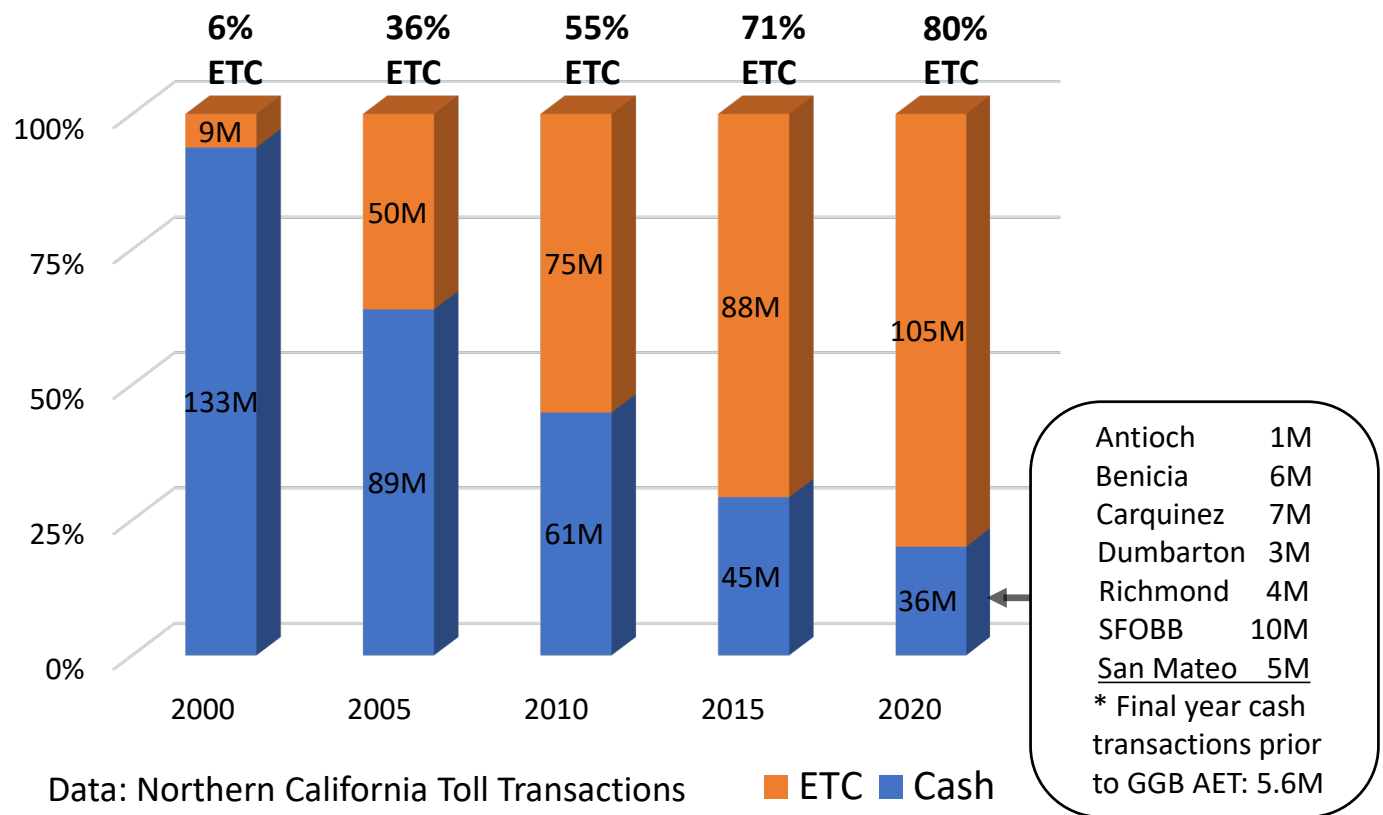
Cost Centers	Civil Cost	Cost Centers	FY 24-25 Operating Cost
Collector Training	\$0	Caltrans Toll Staff	\$28.2M
Consultant Support	\$0	RCSC	\$21.0M
Public Relations	\$0	Credit Card Fees	\$11.5M
Civil	\$0	Tag Purchases	\$12.0M
RCSC	\$0	Tolling System	\$5.1M
Tolling System	\$0	Toll Facilities	\$4.0M
Total Capital Costs	\$0	Yearly Operating Costs	\$82M



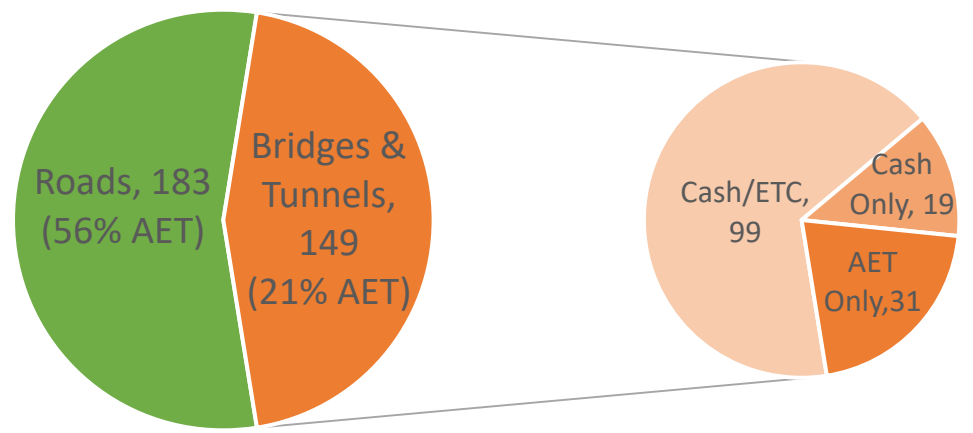
ALL-ELECTRONIC TOLLING

Regional and National Trends

Regional Decrease in Cash Collection



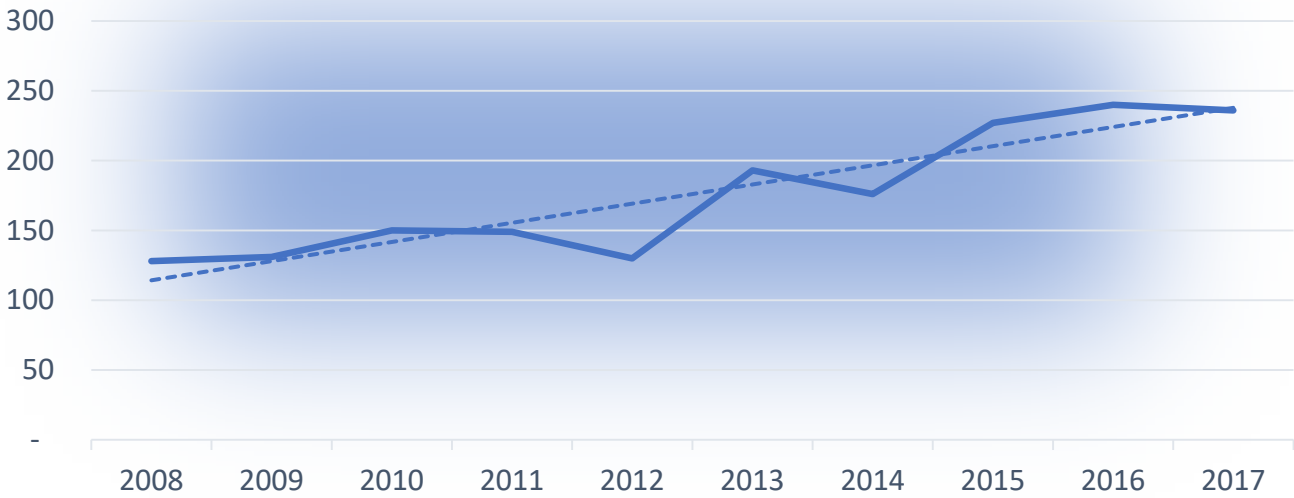
United States Tolling Facilities



Benefit: Improved Safety

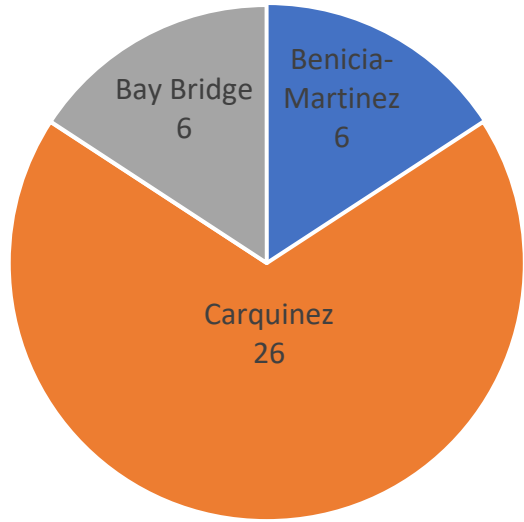
Toll Plaza Accidents

Source: California Highway Patrol

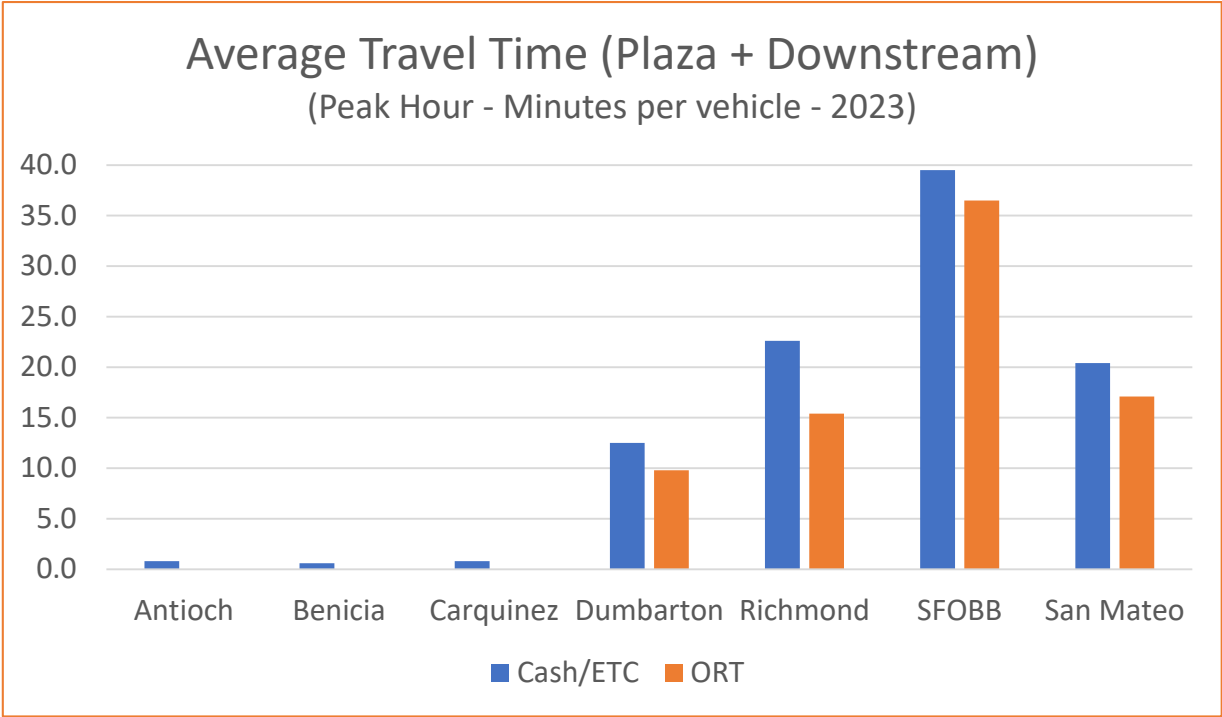


Toll Plaza Robberies

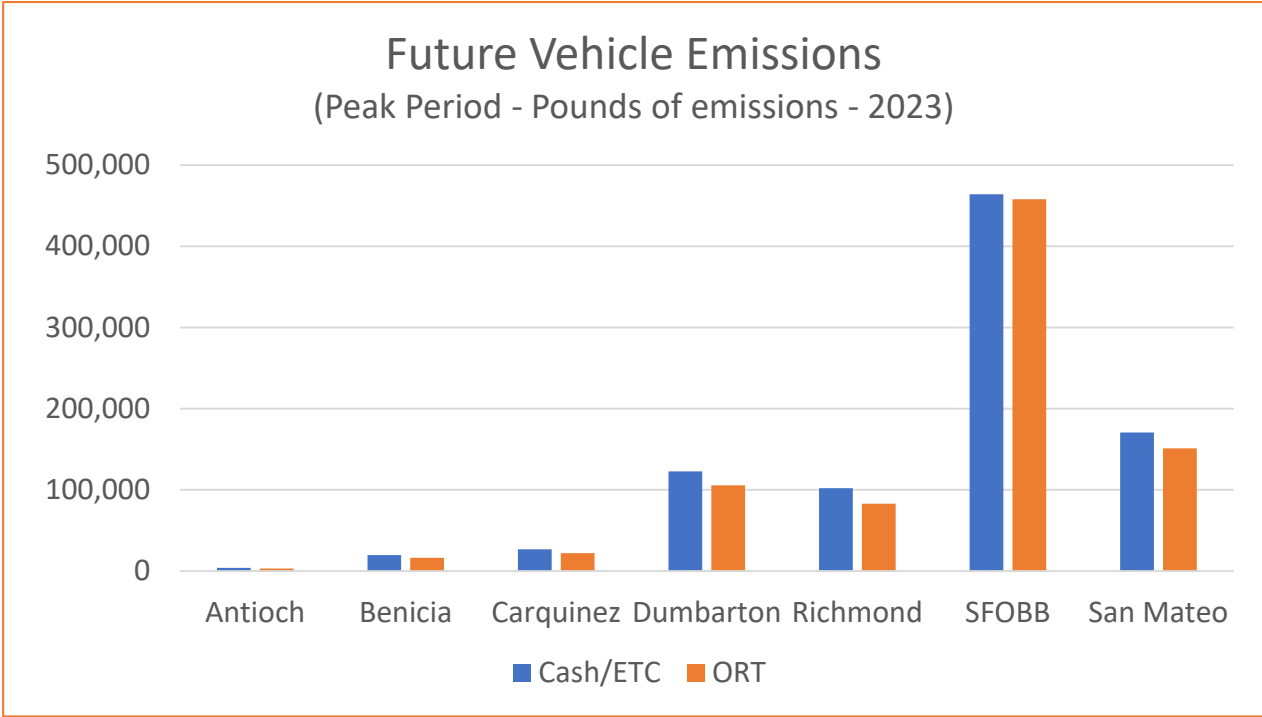
(2005-2017)



Benefit: Reduction in Vehicle Delay / Emissions



Peak Period Travel
Time Savings (2023)
ORT: -13.5k hours, \$48M



Peak Period Emissions
Reduction (2023)
ORT: -154k pounds, -7.8%

Benefit: Congestion Management



AET Enables:

- Bay Bridge, Richmond & Dumbarton Forward
- Smart Metering Lights
- Congestion Pricing
- Bi-directional Tolling

Challenge: Downsize Caltrans Toll Collections

- Caltrans Headquarters would lead the effort
- Toll staff receive priority applying for new positions
- Opportunity to transfer within Caltrans
- Limited-term staffing utilized in future hiring

Caltrans does not provide funding for external training opportunities; however, there may be an opportunity for MTC to assist



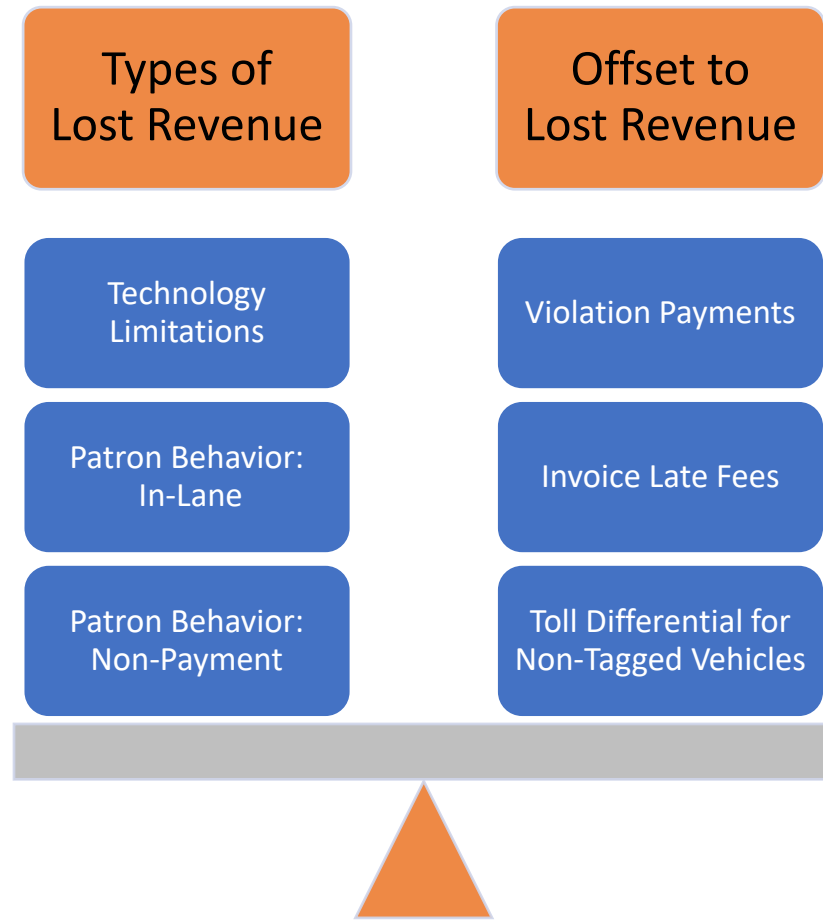
Challenge: Regional Customer Service Center Growth

- Staffing
- Toll Tags
- Image Review
- Mail

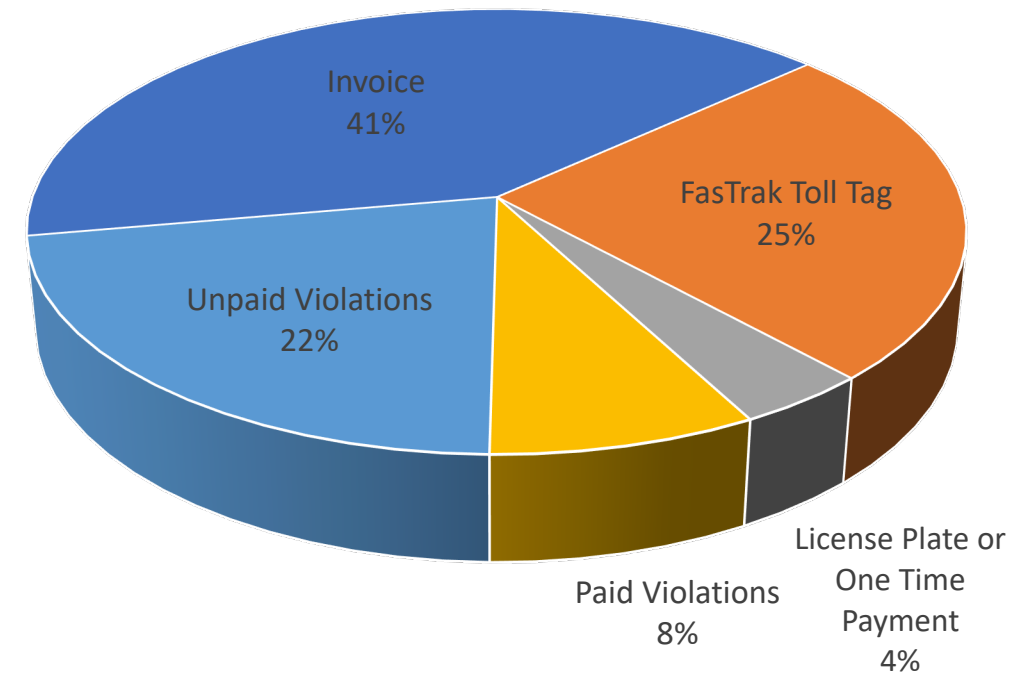
Estimated FY 24-25 RCSC related expenses

Cost Center	AET	Status Quo	Change	% Change
RCSC	\$39.5M	\$21.0M	+ \$18.5M	+ 88%
Credit Card Fees	\$14.7M	\$11.5M	+ \$3.2M	+ 28%
Tag Purchases	\$15.6M	\$12.0M	+ \$3.6M	+ 30%
Manual Toll Collection	\$0	\$28.2M	- \$28.2M	- 100%
Total	\$69.8M	\$72.7M	- \$2.9M	- 4%

Challenge: Minimizing Toll Revenue Loss



Expected AET Payments by Former Cash Customers



Implementation



Toll System

Civil

Labor Reallocation

Customer Service Center

Payment Interfaces

Communication

Implementation Options

Option	AET	ORT	No Change
Date of Earliest Plaza Conversion	Spring 2021	Summer 2022	N/A
Capital Cost	\$23M	\$55M	\$0
Operating Cost (FY 24-25)	\$80M	\$75M	\$82M

- **RCSC**
- **Credit Card Fees**
- **Tag Purchases**
- **Toll System**
- **Toll Facilities**
- **Caltrans Toll Staff**

