



Board Report

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AD HOC CONGESTION REDUCTION COMMITTEE NOVEMBER 18, 2015

SUBJECT: IMPACT OF ALLOWING HIGH OCCUPANCY VEHICLES (HOVS) TO USE I-10 EXPRESSLANES ON THE WEEKENDS WITHOUT A FASTRAK® TRANSPONDER

ACTION: RECEIVE AND FILE

RECOMMENDATION

RECEIVE AND FILE status report on the **assessment of the impact of allowing HOVs to use the I-10 ExpressLanes on the weekends without a FasTrak transponder.**

ISSUE

At the February 2015 Board of Directors meeting, Director Solis requested staff to assess the impacts of removing the ExpressLanes transponder requirement during weekends on the I-10 to allow access to the ExpressLanes for all HOV users. The assessment includes two possible weekend scenarios - one that allows Single Occupant Vehicles (SOVs) to continue to use the ExpressLanes with a transponder while allowing all HOVs users with and without transponders to use the facility. The other scenario would exclude SOV use of the ExpressLanes and the facility would effectively revert to HOV lanes.

DISCUSSION

The current policy, adopted by the Board in July 2009, requires all vehicles to have a transponder 24 hours a day, 7 days a week, when using the Metro ExpressLanes. The transponder requirement allows Metro to manage the ExpressLanes by identifying those who are eligible to use the lanes and sends a notice of violation to those who are in the lanes illegally. When the I-10 HOV lanes were converted to High Occupancy Toll (HOT) also known as ExpressLanes in 2013, the HOV operating hours of the I-10 were preserved to provide an easy transition for existing commuters and to maintain consistency with HOV and HOT lanes operations throughout Southern California. To facilitate traffic management, revenue collection, and enforcement of the ExpressLanes, a requirement that all vehicles have a properly mounted FasTrak transponder was included in the Toll Policy and was approved by the Board in July 2009.

Potential Operating Scenarios

Removing the transponder requirement for weekend HOV use was analyzed for the following two scenarios:

Scenario 1: Open ExpressLanes to HOVs without a Transponder - Allow all HOV users on the I-10 to utilize the ExpressLanes without a transponder during the weekends, while continuing to allow Single Occupant Vehicle (SOV) customers with a transponder to use the lanes and pay a toll. This would require the suspension of all automated violation enforcement activity.

Scenario 2: Operate ExpressLanes as HOV Only Lanes - Allow all HOV users on the I-10 to utilize the ExpressLanes without a transponder during the weekends and exclude SOV customers from using the ExpressLanes. This would require the suspension of all toll collection, violation enforcement and traffic management activities and convert the ExpressLanes back to HOV lanes on weekends.

In order to evaluate the two scenarios, traffic and revenue data on the ExpressLanes and the General Purpose (GP) lanes were collected and analyzed to model existing conditions and to estimate a range of potential ExpressLanes weekend usage under each scenario. As Attachment A illustrates, relevant data including traffic volume, occupancy status, travel frequency, and origin and destination travel patterns were collected and modeled.

The traffic modeling is based on an analysis of travel behaviors, existing data, experience with other facilities, and expert judgment. The modeled behaviors include the potential for corridor users to select the ExpressLanes based on their travel destination, the frequency of travel in the corridor, and the appeal of the ExpressLanes as a travel option. High and Low results were then averaged to determine the estimated increase of vehicle trips.

Analysis

Utilizing this data, the analysis was then split into 3 components: 1) Traffic Management; 2) Toll Revenue Collection; and, 3) Enforcement.

1) Traffic Management

On weekends, the I-10 experiences heavy congestion from 11 a.m. to 5 p.m. Weekend usage on the ExpressLanes has grown steadily with a 33% growth from September 2013 to September 2015. Based on the experience of other Express Lanes operators, it is anticipated that this trend on the I-10 will continue as the program matures.

Scenario 1: The introduction of HOV customers without transponders into the ExpressLanes could result in an average increase in vehicular trips estimated at 70%. This growth could fill the lanes with HOVs, disincentivizing SOVs from using the facility and eliminating the ability to manage congestion through pricing.

Scenario 2: The introduction of HOV customers without transponders and the elimination of all SOV customers from the ExpressLanes could result in an estimated 45% average increase in trips. Similar to Scenario 1, HOV growth and removal of pricing would impact Metro’s ability to manage traffic and may be seen by SOV customers who have been allowed on the ExpressLanes on the weekends as contradictory to commitments made to the community at the time of project development. As a result occasional SOV & HOV customers may return their transponders and become violators as discussed in the enforcement section.

Analysis indicates that allowing HOVs to use the I-10 ExpressLanes system without a transponder could yield a marginal increase of up to 5 MPH in travel speeds in the GP lanes.

Weekend Scenario	Traffic Management Impact
Scenario 1: Open ExpressLanes to HOVs without a Transponder	<ul style="list-style-type: none"> • 70% increase in ExpressLanes traffic. • Inability to manage ExpressLanes traffic without a robust enforcement program.
Scenario 2: Operate ExpressLanes as HOV Only Lanes	<ul style="list-style-type: none"> • 45% increase in ExpressLanes traffic. • Inability to manage ExpressLanes traffic without Dynamic Pricing and a robust enforcement program.

2) Enforcement

The ExpressLanes currently require all vehicles to use a transponder and to properly declare their occupancy via a switch setting on the in-vehicle transponder. These requirements are enforced through a combination of California Highway Patrol (CHP) and an automated VES based on the presence of a transponder. The enforcement program is critical to management of the ExpressLanes and protects both paying SOV customers and non-paying HOV customers by minimizing the usage of the ExpressLanes by non-compliant vehicles or violators. Since opening in 2012, due to Metro’s continuing education and marketing campaigns as well as CHP enforcement, the violation rate has decreased from approximately 14% to 5% which is consistent with ExpressLanes operations across the nation.

Scenario 1: Removing the requirement for a transponder for HOVs compromises the automated portion of the enforcement program, thus transferring the full burden of enforcement to the CHP, who are not providing dedicated ExpressLanes enforcement on the weekends. The annual cost to add CHP enforcement on the weekends would be \$600,000. Without the HOV transponder, additional

SOVs may be induced to violate due to reduced chances of detection. Additionally, the lack of consistency between weekend and weekday operations and the I-110 ExpressLanes' transponder requirement will likely create confusion for weekday customers, increase the rate of violations thereby degrading weekday ExpressLanes operations, and potentially cause a decrease in customer satisfaction and public acceptance.

Scenario 2: Restricting the ExpressLanes to HOV Only use will effectively convert the ExpressLanes to HOV lanes on the weekends. This scenario simplifies enforcement by CHP as they would only enforce vehicle occupancy. However, CHP currently does not provide dedicated enforcement of the ExpressLanes on the weekends so ExpressLanes weekends patrol would cost an additional \$600,000 per year. Without dedicated CHP enforcement it is likely that SOVs with or without transponders will enter the lanes. Additionally, as discussed in Scenario 1, the number of violations during the week will likely increase due to customer confusion over differing operating parameters.

Weekend Scenario	Enforcement Impact
Scenario 1: Open ExpressLanes to HOVs without a Transponder	<ul style="list-style-type: none"> • Increased burden of enforcement on CHP due to suspension of automated enforcement. • Reduced compliance by SOVs due to suspension of automated enforcement. • Confusion during weekday operations, increasing the rate of violators and degrading weekday traffic conditions.
Scenario 2: Operate ExpressLanes as HOV Only Lanes	<ul style="list-style-type: none"> • Increased workload for CHP due to increased vehicle traffic in the ExpressLanes. • Confusion during weekday operations, degrading weekday operations and increasing the rate of violators.

3) Toll Revenue Collection

The I-10 corridor generates approximately \$4.6M annually in weekend toll and violation revenue. This revenue ensures the ExpressLanes are financially self-sustaining, funds the necessary capital and operational improvements, and contributes to the funding of Net Toll Revenue grants.

Scenario 1: The introduction of HOV customers without transponders into the ExpressLanes could result in an estimated loss of between \$400,000 to \$600,000 annually due to additional HOVs in the ExpressLanes displacing SOVs. Conversely, SOVs without transponders could be enticed to use the ExpressLanes without paying a toll or penalties, further eroding toll revenue and increasing revenue loss. Metro could also lose approximately \$2.4M annually in weekend violation revenue, since the automated Video Enforcement System (VES) would be suspended and no violation notices could be issued as the system would have no way of distinguishing between a legitimate no-transponder HOV and a violating no-transponder SOV.

Scenario 2: Operating the ExpressLanes as HOV only lanes on the weekends would result in the

loss of all weekend toll revenue, amounting to approximately \$2.2M annually. Additionally, Metro would lose all weekend violation revenue, amounting to \$2.4M annually since the automated VES would need to be suspended. Further, a change to the weekend toll policy would likely result in the closure of some FasTrak accounts and create public dissatisfaction over the removal of the SOV option to use the ExpressLanes on the weekends.

Weekend Scenario	Toll Revenue Impact
Scenario 1: Open ExpressLanes to HOVs without a Transponder	<ul style="list-style-type: none"> • Loss of toll revenue estimated to be between \$400K and \$600K annually due to fewer paying SOV customers. • Loss of violation fee revenue estimated to be approximately \$2.4M annually due to suspension of automated VES. • Impacts to weekday revenue due to confusion caused by the change in transponder policy and a corresponding increase in violation processing costs.
Scenario 2: Operate ExpressLanes as HOV Only Lanes	<ul style="list-style-type: none"> • Loss of all weekend toll revenues estimated to be \$2.2M annually. • Loss of violation fee revenue estimated to be approximately \$2.4M annually. • Impacts to weekday toll revenue due to confusion caused by the change in transponder policy and an increase in processing costs.

Required Changes

Both scenarios would require changes to on-road signage, the toll system software, Customer Service Representative (CSR) training, customer materials, and public outreach. The cost to perform these changes is estimated to be as follows:

Item	Scenario 1: Open ExpressLanes to HOVs without a Transponder	Scenario 2: Operate ExpressLanes as HOV Only Lanes
Initial (One-Time) Cost*	\$1.4M to \$2.0M	\$1.4M to \$2.0M
Annual Toll Revenue Loss	\$0.4M to \$0.6M	\$2.2M
Annual Violation Revenue Loss	\$2.4M	\$2.4M
Increased Annual CHP Enforcement Costs	\$600,000	\$600,000
First Year Cost (sum of above)	\$4.8M to \$5.6M	\$6.6M to \$7.2M
Annual Revenue Loss (toll/violation)	\$2.8M to \$3.0M	\$4.6M

* Signage modifications
 Software development and implementation
 Re-printing of materials and updating the website
 Public Outreach

Additionally, the current toll vendor contract is based on a projected number of FasTrak accounts and violation notices. Depending on how this change is implemented it could represent a material change to the contract.

Finally, at the local level, the toll administration and violation ordinance would require updating to reflect these changes, further necessitating staff and/or consultant resources.

Operations of Other Similar ExpressLanes

An examination other ExpressLanes across the country that were converted from HOV to HOT lanes (I-95 Atlanta, I-85 in Miami) with similar transponder requirements and business rules for HOVs, reveals the following:

The I-95 Express Lanes in Miami is a 24/7 operation that adopted the original HOV hours and requires HOVs to have a transponder to utilize the lanes. They also have a VES and dedicated highway patrol to actively monitor and enforce the lanes. To qualify as a toll-free carpool they must have three or more people in the vehicle and must register their carpool status by completing a carpool application.

The I-85 Express Lanes in Atlanta is another 24/7 Express Lane operation which requires three or more people per vehicle to qualify for toll-free carpool status. Both SOV and HOV users require the use of a switchable transponder. Enforcement is a combination of highway patrol, VES, invisible barriers and other technology in lanes to ensure legal use of the lanes at all times. Their program adopted existing HOV hours and continues to maintain 24/7 hour operation to avoid customer confusion and potential operating costs.

Existing and future facilities in Orange and Riverside Counties are either currently or will in the future operate 24/7 and require transponders for SOV and HOV customers at all times. Each facility has a VES and dedicated CHP enforcement to monitor and enforce the lanes. Their programs have also begun selling switchable transponders to allow their customers to declare their occupancy on Metro's ExpressLanes.

Conclusions

Analysis indicates that allowing HOVs to use the I-10 ExpressLanes system without a transponder could yield a marginal increase of up to 5 MPH in travel speeds in the GP lanes. However, the analysis also reveals that this could severely or completely inhibit the ability to effectively manage and enforce the ExpressLanes, confuse drivers, and result in initial and recurring cost to Metro. The revenue losses identified above will directly impact the amount of funding available for system improvements, reserve funds and corridor reinvestment grants.

Since the system is in ramp up mode and weekend usage is expected to increase by 15% over the next year, staff does not recommend waiving tolling on the weekends.

Finally, while this analysis focuses on the I-10, we anticipate that Metro will be compelled to apply these new weekend business rules to the I-110 to ensure consistency and equity among the ExpressLanes users in both corridors. If this happens, the revenue losses for Metro will be significantly higher.

NEXT STEPS

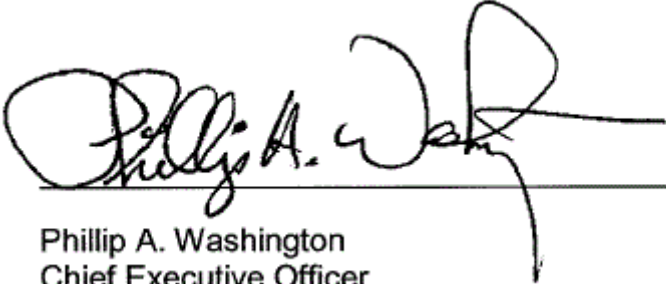
Staff will continue to monitor the performance of the corridor and will address weekend usage as part of a larger ExpressLanes policy review.

ATTACHMENTS

Attachment A - Traffic Data Collected & Modeled

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Attachment A

The following lists identify the data collected and modeled to determine the potential volumes of traffic that might be eligible to use the ExpressLanes, and, under the different scenarios, that might potentially switch to the ExpressLanes.

Data collected included:

- Actual traffic and revenue by direction on the I-10 ExpressLanes for Saturdays and Sundays by each individual day for 2015;
- Actual traffic by hour and direction in the General Purpose (GP) lanes for Saturdays and Sundays by each individual day for 2015;
- Existing HOVs in the General Purpose lanes on Saturdays and Sundays via two weekend field surveys;
- Travel frequency data on typical weekends; and
- Origin and destination trip patterns on the I-10 general purpose lanes.

Existing conditions were modeled in order to:

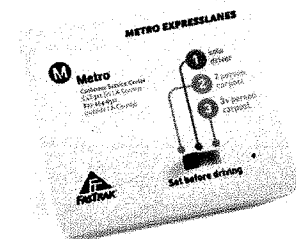
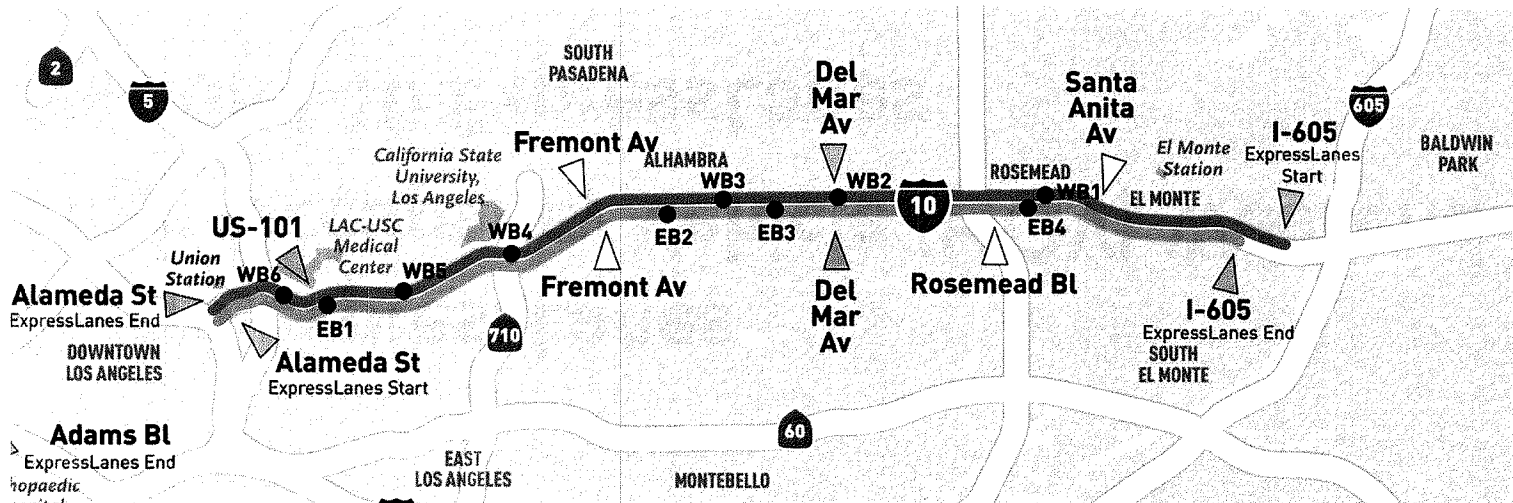
- Determine amount of actual HOV and SOV volumes in the ExpressLanes and GP lanes (to determine overall volumes in the corridor);
- Determine origin and destination travel patterns in the corridor (to determine those who by nature of their travel patterns and the locations of ingress/egress of the ExpressLanes could potentially switch to the ExpressLanes);
- Determine travel frequency of potential ExpressLanes users (to determine different potential usage of ExpressLanes by frequency of travel category);
- Determine amount of actual HOV and SOV traffic in the ExpressLanes lanes (to determine potential capacity available in the ExpressLanes);
- Assign 'potential' (those who may switch) traffic to the ExpressLanes (based on volumes, origin and destination patterns, travel frequency, and available capacity); and
- Assign 'diverted' (those estimated to switch) HOV and SOV traffic to the ExpressLanes.

**Metro ExpressLanes
High Occupancy Vehicle (HOV) Weekend
Use on I-10 ExpressLanes
November 18, 2015**



Background

- Assessment of the impacts of removing the ExpressLanes transponder requirement during weekends on the I-10 to allow access to the ExpressLanes for HOV users



I-10 ExpressLanes HOV Requirements

	Monday – Friday (Peak Hours)	Monday – Friday (Off Peak)	Weekend
Hours	5am-9am; 4pm-7pm	Non-Peak Hours	All day
Toll Free	3+ Occupants	2+ Occupants	2+ Occupants

- **Current business rules:**
 - **All vehicles including HOV have a properly mounted FasTrak transponder to use the ExpressLanes**
 - **Switchable transponder allows declaration of occupancy to travel toll-free on the ExpressLanes**
 - **Transponder requirement enhances customer confidence by catching people “cheating” the system**
 - **24/7 automated enforcement identifies violators without a transponder**
 - **CHP enforces transponder & occupancy requirement during weekday AM/PM peak**
 - **Transponder technology allows the implementation of Carpool Loyalty Program**



Similar Express Lanes Programs

	Metro I-10	FDOT I-95	SRTA I-85
Location	Los Angeles County	Miami-Dade County	Atlanta
Transponder	FasTrak (Switchable)	SunPass (HOV Application)	Peach Pass (Switchable via Website or App)
HOV Requirement	3+ Peak, 2+ Offpeak	3+	3+
Pricing	Dynamic	Dynamic	Dynamic
Operation	24/7	24/7	24/7
Enforcement	Highway Patrol, VES	Highway Patrol, VES	Highway Patrol, VES, Invisible Barrier
Origins	Adopted Existing HOV Hours	Adopted Existing HOV Hours	Adopted Existing HOV Hours



I-10 ExpressLanes and General Purpose (GP) Lane Weekend Conditions

- **I-10 GP Lane Weekend Conditions**
 - Heavily utilized but minimal stop and go traffic
 - Data from same period in 2012 prior to implementation of the ExpressLanes show similar pattern of utilization and speeds
- **ExpressLanes Weekend Conditions**
 - Free-flow traffic
 - Project constructed an additional lane when converted to ExpressLanes

Potential Operating Scenarios

- **Scenario 1:** Allow all HOV users on the I-10 to utilize the ExpressLanes without a transponder during the weekends, while continuing to allow SOV customers with a transponder to use the lanes.
- **Scenario 2:** Allow all HOV users on the I-10 to utilize the ExpressLanes without a transponder during the weekends and exclude SOV customers from using the ExpressLanes.



I-10 ExpressLanes – Traffic Management

Weekend Scenario	Traffic Management Impact
Scenario 1: Open ExpressLanes to HOVs without a Transponder (SOVs with a Transponder)	<ul style="list-style-type: none"> • 70% increase in ExpressLanes traffic. • Inability to manage ExpressLanes traffic without an enforcement program.
Scenario 2: Operate ExpressLanes as HOV Only Lanes	<ul style="list-style-type: none"> • 45% increase in ExpressLanes traffic. • Inability to manage ExpressLanes traffic without Dynamic Pricing and an enforcement program.

- **Weekend I-10 usage on the ExpressLanes has grown steadily by 33% from September 2013 to September 2015**
- **Anticipate increase by 15% over the next year in weekend usage as the program continues to mature**
- **Analysis indicates that allowing HOVs to use the I-10 ExpressLanes system without a transponder could yield a marginal increase of up to 5 MPH in travel speeds in the GP lanes.**

I-10 ExpressLanes – Enforcement

Weekend Scenario	Traffic Management Impact
Scenario 1: Open ExpressLanes to HOVs without a Transponder (SOVs with a Transponder)	<ul style="list-style-type: none">• Increased burden of enforcement on CHP due to suspension of automated enforcement.• Reduced compliance by SOVs due to suspension of automated enforcement.• Confusion during weekday operations, increasing the rate of violators and degrading weekday traffic conditions.
Scenario 2: Operate ExpressLanes as HOV Only Lanes	<ul style="list-style-type: none">• Increased workload for CHP due to increased vehicle traffic in the ExpressLanes.• Confusion during weekday operations, degrading weekday operations and increasing the rate of violators.

I-10 ExpressLanes – Toll Revenue Collection

- **I-10 - \$4.6M in Annual Weekend Revenue**
- **Required Changes**
 - **On Road Signage**
 - **Toll System Software,**
 - **Customer Service Representative Training**
 - **Customer Materials and website update**
 - **Public Outreach**
- **Potential material change to existing toll vendor contract**
- **Additional staff and consultant resources to manage changes**

I-10 ExpressLanes – Toll Revenue Collection

	Scenario 1	Scenario 2
Initial (One-Time) Cost	\$1.4M to \$2.0M	\$1.4M to \$2.0M
Annual Toll Revenue Loss	\$0.4M to \$0.6M	\$2.2M
Annual Violation Revenue Loss	\$2.4M	\$2.4M
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Conclusions

- Operations on I-110 may require a policy shift to ensure consistency & equity
- Marginal increase in GP lane speeds of up to 5 MPH
- Inhibits management of lanes as originally adopted
- Increased driver confusion and violations
- Increased Capital & Operating Costs/ Loss of Revenue
- I-10 ExpressLanes continue to see greater weekend utilization and expect a 15% growth over the next year

