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I-580 Express Lane Policy Committee Meeting Agenda
Monday, March 12, 2018, 10:00 a.m.

Committee Chair:	Nate Miley, Alameda County, District 4	Executive Director:	Arthur L. Dao
Vice Chair:	David Haubert, City of Dublin	Staff Liaison:	Elizabeth Rutman
Members:	Scott Haggerty, John Marchand, Jerry Thorne	Clerk of the Commission:	Vanessa Lee
Ex-Officio:	Richard Valle, Pauline Cutter		

1. Call to Order/Pledge of Allegiance

2. Roll Call

3. Public Comment

4. Consent Calendar

		Page	Action
4.1.	Approve February 12, 2018 I-580 Express Lane PC Meeting Minutes	1	A

5. Regular Matters

5.1.	Approve Release of Request For Proposal (RFP) for I-580 Toll System Integrator and RFP for Express Lane System Manager/Program Support and Authorize negotiations with top ranked firms	3	A
5.2.	I-580 Express Lanes: Monthly Operations Status Update	9	I

6. Committee Member Reports

7. Staff Reports

8. Adjournment

Next Meeting: Monday, April 9, 2018

Notes:

- All items on the agenda are subject to action and/or change by the Commission.
- To comment on an item not on the agenda (3-minute limit), submit a speaker card to the clerk.
- Call 510.208.7450 (Voice) or 1.800.855.7100 (TTY) five days in advance to request a sign-language interpreter.
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ALAMEDA County Transportation Commission

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Alameda CTC Schedule of Upcoming Meetings:

Description	Date	Time
Alameda County Technical Advisory Committee (ACTAC)	April 5, 2018	1:30 p.m.
Finance and Administration Committee (FAC)	April 9, 2018	8:30 a.m.
I-680 Sunol Smart Carpool Lane Joint Powers Authority (I-680 JPA)		9:30 a.m.
I-580 Express Lane Policy Committee (I-580 PC)		10:00 a.m.
Planning, Policy and Legislation Committee (PPLC)		10:30 a.m.
Programs and Projects Committee (PPC)		12:00 p.m.
Transit Planning Committee (TPC)		1:30 p.m.
Independent Watchdog Committee (IWC)	July 9, 2018	5:30 p.m.
Paratransit Technical Advisory Committee (ParaTAC)	September 11, 2018 (tentative)	9:30 a.m.
Alameda CTC Commission Meeting	March 22, 2018	2:00 p.m.
Paratransit Advisory and Planning Committee (PAPCO)	March 26, 2018	1:30 p.m.
Bicycle and Pedestrian Community Advisory Committee (BPAC)	March 29, 2018	5:30 p.m.

All meetings are held at Alameda CTC offices located at 1111 Broadway, Suite 800, Oakland, CA 94607. Meeting materials, directions and parking information are all available on the Alameda CTC website.

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1. **Roll Call**
   A roll call was conducted. All members were present.

2. **Public Comment**
   There were no public comments.

3. **Consent Calendar**
   3.1. Approve the January 8, 2018 I-580 Express Lane PC meeting minutes.

   Commissioner Haggerty moved to approve the Consent Calendar. Commissioner Kaplan seconded the motion. The motion passed with the following votes:

   Yes: Marchand, Miley, Haggerty, Haubert, Thorne, Kaplan, Valle, Cutter
   No: None
   Abstain: None
   Absent: None

4. **Regular Matters**
   4.1. I-580 Express Lanes (PN 1373.002): Monthly Operations Update.
   Art Dao recognized and thanked CHP Officers, Captain Chris Sherry, Kiel Christensen, and Tyler Hahn that attended the meeting. He thanked the officers for working with the Alameda CTC and helping the agency to be a model for the entire region.

   A public comment was heard from CHP Officer Captain Chris Sherry. He reported that they had an excellent month in January 2018. He noted that the CHP made adjustments to the hours and the quarterly report will reflect their hard work. Captain Sherry stated that the CHP is recommitted to the HOV enforcement in the entire Bay Area.

   Commissioner Haggerty asked if CHP is on Nextdoor social media site. Captain Sherry stated that CHP is not on Nextdoor; however, the comments on other social media sites are very positive.

   Ashley Tam presented the I-580 Express Lanes monthly operations update. The update covered average trips by month; user trip breakdown; corridor speed and density heat maps both directions of travel; and historical toll rates.; She concluded by reviewing estimated gross toll revenues versus approved fiscal year operating budget.

   Commissioner Haubert stated that he is surprised that the heat map in the westbound direction is showing more green in the general purpose lane during the morning traffic.

Commissioner Haggerty asked if the agency considered moving the Express Lane further up the hill on the eastbound commute. Tess Lengyel stated that Alameda CTC did an internal analysis of the I-580 corridor from the Bay Bridge to the County Line on the Altamont Corridor. She noted that the analysis was done in four segments: 1) From the Bay Bridge to Castro Valley on I-580. She noted that Alameda CTC is working with the Metropolitan Transportation Commission on alternative analysis for this segment; 2) Castro Valley over the Dublin Grade and up to the I-58/I-680 Interchange; 3) I-580 Express Lane; and 4) up the Altamont Grade to the County Line. Ms. Lengyel stated that San Joaquin is initiating analysis looking at Express Lanes on their side of the County and Alameda CTC will coordinate with them. Segments are being monitored and staff will proposals to the Commission in the next few months.

In response to a question posed in I-680 by Supervisor Haggerty, Art Dao stated that Alameda CTC will bring to the Committee an expenditure plan for excess toll revenue in April. He noted that both I-580 and I-680 Express Lanes are operating under State Stature Assembly Bill 2032 and subordinate legislation, which lay out concepts for an Expenditure Plan and day-to-day operation.

Commissioner Miley asked if the revenue will be sustained. Art Dao stated at this point the answer is yes.

This item was for information only.

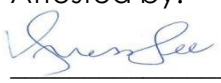
5. **Committee Member Reports**
   There were no committee reports.

6. **Staff Reports**
   There were no staff reports.

7. **Adjournment/ Next Meeting**
   The next meeting is:

   Date/Time: Monday, March 12, 2018 at 10:00a.m.
   Location: Alameda CTC Offices, 1111 Broadway, Suite 800, Oakland, CA 94607

Attested by:



Vanessa Lee, Clerk of the Commission

DATE:	March 5, 2018
TO:	I-580 Express Lane Policy Advisory Committee
FROM:	Liz Rutman, Director of Express Lanes Implementation and Operations
SUBJECT:	I-580 Express Lanes Operations and Upgrade (PN 1373002 and 1486000): Approve Release of Request For Proposal (RFP) for I-580 Toll System Integrator and RFP for Express Lane System Manager/Program Support and Authorize negotiations with top ranked firms

Recommendations

Approve the release of a request for proposals (RFP) for new Electronic Toll System Integrator Services (ETSIS) for I-580 Express Lanes and future express lane corridors and authorize the Executive Director to negotiate an ETSIS Agreement with the top ranked firm.

Approve the release of an RFP for Express Lane System Manager/Program Support Services for the I-580 and I-680 Express Lanes programs and authorize the Executive Director to negotiate a Professional Services Agreement with the top ranked firm.

Summary

The Alameda CTC is the project sponsor of the I-580 Express Lanes, located in the Tri-Valley corridor through the cities of Dublin, Pleasanton, and Livermore, which opened to traffic on February 19th and 22nd of 2016. The current toll system, procured initially in 2009 and modified in 2013 to incorporate an enhanced violation enforcement system, lacks technological advances in vehicle detection and identification that would increase both enforcement and toll revenues.

Staff recommends that the Commission approve the release of an RFP for Electronic Toll System Integration Services (ETSIS) to upgrade the I-580 toll system to provide enhanced vehicle detection and identification and authorize the Executive Director to negotiate an ETSIS agreement with the top-ranked firm. Upon Commission approval, staff intends to issue the RFP in April 2018, and expects to return to the Commission in October 2018 with an award recommendation. The resulting base contract would be funded by I-580 Express Lanes toll revenues. The estimated duration to complete implementation of the new system is 18

months; the Agreement would include an additional 8 years of turnkey maintenance services with four optional one-year extensions, as well as option to provide ETSIS on future express lane corridors we may implement.

In coordination with Alameda CTC staff, a System Manager provides technical oversight of the Toll System Integrator (TSI) during the design, development, testing, and implementation of the toll system. In addition, a System Manager may provide support during operations to ensure key performance metrics are met throughout the life of the system.

The current System Manager for I-580 was procured in 2011 and that Agreement will expire in August 2018. With the proposed new ETSIS procurement, staff recommends that the System Manager services also be procured at this time. Staff also recommends that this RFP include optional tasks for I-580/I-680 Express Lane Program Support, including but not limited to technical and strategic advice relating to interfacing connecting toll systems, Automated Vehicle technology, Automated Occupancy Detection, occupancy discount policy, and future express lane expansion implementation. Staff recommends that the Commission approve the release of an RFP for Express Lane System Manager/Program Support Services and authorize the Executive Director to negotiate a professional services agreement with the top-ranked firm. Upon Commission approval, staff intends to issue the RFP in April 2018, concurrent with the ETSIS RFP, and expects to return to the Commission in July 2018 with an award recommendation. The resulting contract would be funded by I-580 and I-680 Express Lanes toll revenues and would be for a term of 3 years with two one-year options.

Background

The I-580 Express Lanes, extending from Hacienda Drive to Greenville Road in the eastbound direction and from Greenville Road to San Ramon Road/Foothill Road in the westbound direction, were opened to traffic on February 19th and 22nd of 2016 in the eastbound and westbound directions, respectively. Motorists using the I-580 Express Lanes facility benefit from travel time savings and travel reliability as the express lanes optimize the corridor capacity by providing a new choice to drivers. Single occupancy vehicles (SOVs) may choose to pay a toll and travel within the express lanes, while carpools, clean-air vehicles, motorcycles, and transit vehicles enjoy the benefits of toll-free travel in the express lanes if they have a valid FasTrak flex toll tag in the vehicle.

An All Electronic Toll (AET) collection method has been employed to collect tolls. Toll rates are calculated based on real-time traffic conditions (speed and volume) in express and general purposes lanes and can change as frequently as every three minutes. California Highway Patrol (CHP) officers provide enforcement services and the California Department of Transportation (Caltrans) provides roadway maintenance services through reimbursable service agreements.

I-580 Toll System Upgrade

Electronic Transaction Consultants Corporation (ETCC) was selected by Alameda CTC in 2009, under a competitive selection process, to provide Electronic Toll System integration Services for the eastbound I-580 express lane. In July 2013, the Commission determined that it was in the best interest of the Alameda CTC and the Express Lanes Project to utilize ETCC to deliver the westbound facilities in addition to delivering the eastbound project, and expanded the scope of the express lanes to include enhanced violation enforcement systems in the form of license plate image capture cameras and the ability to process the images for tolling. The scope of work included only a single year of system warranty services and very few performance metrics associated with the image capture system. Due to the unique requirements of the technology infrastructure associated with express lanes, it is customary in the toll industry for the TSI to provide Operations and Maintenance (O&M) support services for the hardware and software they designed and deployed. In May 2017, the Commission authorized a new Operations and Maintenance Agreement with ETCC to retain their services for up to three years. At the time of that approval, the Commission questioned the estimated cost of $1 million per year for manual image review. After further analysis, staff determined that the cost of the manual image review exceeded the estimated revenue gain from the service and manual image review was stopped at the end of May 2017.

A new analysis of the transactions and how they are processed shows that the toll system deficiencies result in loss of toll revenues. Every time a vehicle passes beneath a toll gantry, the system captures an image of the vehicle. Without manual image review, if the system cannot read the image with sufficient confidence in the result, and if the vehicle does not have a toll tag, the transaction is discarded. The sample data evaluated suggests a general transaction breakdown as shown in this table:

Toll Tag Detected		79.0%
No Toll Tag Detected	Plate Read and Trip Formed	13.3%
	Image not Human Readable (vehicle may have no plate, obscured plate, or poor quality image capture)	2.5%
	Dealer plate	1.9%
	Human Readable Image not electronically interpreted[1]	3.3%

[1] The current system is unable to decipher specialty plates, disabled person plates, out-of-state plates, and other non-standard plates even if the image is clear.

Currently, vehicles purchased at a car dealership are issued temporary windshield registrations and no license plate, so the dealer installs a dealer plate. This is effectively no plate, thus a vehicle with a dealer plate and no toll tag is evading the toll. In 2016, AB516 (Mullin) was signed into law. Effective January 1, 2019, DMV will implement a process for

issuing temporary license plates in lieu of dealer plates to commercially purchased vehicles. However, based on the current system's inability to read specialty plates, we anticipate the current system will not read these temporary plates, either. Combined with the other human readable plates not electronically interpreted, approximately 5 percent of revenue-generating transactions would be discarded. With a forecast toll revenue this year of $11.5 million, excluding violation penalties, the estimated revenue loss is $575,000.

The current toll system utilizes a single Optical Character Recognition (OCR) engine and requires that the engine return a complete plate read with high confidence in order to use the image for trip formation. New toll systems utilize multiple OCR engines, partial license plates, and other vehicle image characteristics, as well as machine learning, to match images together. This greatly increases the number of transactions that can be incorporated into trips, thus increasing revenue, with a significantly lower number of images requiring manual review.

While it may be possible to engage ETCC to perform some system upgrades to increase performance, this effort is not part of the existing O&M Agreement and would likely cost more than the revenue it would generate, and the resulting system would still not be comparable to the capabilities of the newer technologies. With an expected lifespan of 8 – 12 years, if not replaced now, the current toll system would likely be fully replaced in 6 years. Replacement now would result in significant additional revenue during those six years that would offset the cost of the early replacement.

The toll industry, and in particular the express lane industry, is moving toward long-term agreements with the TSI that include turnkey maintenance with requirements to maintain the software and hardware according to key performance metrics assigned at the start of the project. These agreements are structured for the entire lifespan of the toll system, typically 10-14 years when the implementation phase is included, and the O&M and performance audit costs negotiated up front.

System Manager Services

Implementation of any new toll system requires the assistance of System Manager Services. These consultants provide technical expertise relating to toll system design, testing and deployment; oversee the TSI, including review and approval of all TSI deliverables; and often provide ongoing support during operations for items such as performance audits and evaluation of potential liquidated damage assessments relating to the key performance metrics.

In July 2011, the Commission authorized the execution of Professional Services Agreement ("Agreement") with CDM Smith, Inc. (formerly Wilbur Smith Associates Inc.) for System Manager Services for the I-580 and I-680 Northbound Express Lanes. CDM Smith currently provides limited on-call support for the I-580 Express Lanes, and that Agreement will expire in August 2018.

In July 2016, the Commission authorized the execution of Professional Services Agreement ("Agreement") with HNTB Corporation for System Manager Services for the I-680 Northbound Express Lanes implementation, with an option to provide operations support for the I-580 Express Lanes. The I-680 Express Lanes scope will culminate in System Acceptance at the end of the one-year warranty period in 2021. The I-580 Operations Support task was not envisioned to include a major system upgrade addressed by the ETSIS RFP.

Staff recommend a new procurement be conducted for a System Manager to oversee the new I-580 ETSIS efforts. Upon System Acceptance of the I-680 Express Lanes, the selected System Manager would provide ongoing support for the I-680 Express Lanes as well, consolidating that effort under a single System Manager.

Program Support Services

The Alameda CTC Express Lanes program is growing. We are currently operating two corridors, designing new systems, and planning for future expansions. Meanwhile, other regional agencies are developing express lanes and soon the region will experience two systems coming face-to-face for the first time. Such actions require not only coordination, but technical advice on how to ensure a seamless system for the traveling public.

Concurrently, the toll industry is changing at a rapid pace. This year we will be implementing the new 6C toll tag protocol recently adopted by the State of California, which necessitates software updates to both of the existing toll systems. Regional and state operators are discussing toll policies such as occupancy, clean-air vehicle, and nationwide interoperability standards. Various levels of government are trying to plan for the impending arrival of automated and connected vehicles. Toll system expansions may necessitate consideration of alternative funding and/or implementation strategies. In order to make effective recommendations to the Commission, staff needs the input from industry leaders who can provide strategic advice on such matters. As part of the System Manager procurement, staff recommends the RFP include optional scope elements that would solicit a team capable of providing such strategic advice as an on-call service.

Staff recommends the Commission approve the release of two RFPs, one for Electronic Toll System Integrator Services and one for Express Lane System Manager/Program Support Services, to be released concurrently; and authorize the Executive Director to negotiate respective agreements with each of the top ranked firms. The ETSIS Agreement is envisioned as a 2-year implementation phase, 8-year turnkey O&M phase, and four optional one-year O&M extensions, as well as an option to provide ETSIS for future express lane corridors we may implement. The System Manager/Program Support Services Agreement is envisioned as a 3-year agreement with two one-year optional extensions, after which the contract would be re-procured.

Fiscal Impact: There is no fiscal impact associated with the requested action.

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DATE:	March 5, 2018
TO:	I-580 Express Lane Policy Advisory Committee
FROM:	Liz Rutman, Director of Express Lanes Implementation and Operations Ashley Tam, Assistant Transportation Engineer
SUBJECT:	I-580 Express Lanes (PN 1373.002): Monthly Operation Update

Recommendation

Status update on the operation of I-580 Express Lanes. This item is for information only.

Summary

The Alameda CTC is the project sponsor of the I-580 Express Lanes, located in the Tri-Valley corridor through the cities of Dublin, Pleasanton, and Livermore, which opened to traffic on February 19th and 22nd of 2016. See Attachment A for express lane operation limits.

The January 2018 operations report indicates that the express lane facility continues to provide travel time savings and travel reliability throughout the day. Express lane users typically experienced higher speeds and lesser average lane densities than the general purpose lanes, resulting in a more comfortable drive and travel time savings for express lane users.

Background

The I-580 Express Lanes, extending from Hacienda Drive to Greenville Road in the eastbound direction and from Greenville Road to San Ramon Road/Foothill Road in the westbound direction, were opened to traffic on February 19th and 22nd of 2016 in the eastbound and westbound directions, respectively. See Attachment A for express lane operation limits. Motorists using the I-580 Express Lanes facility benefit from travel time savings and travel reliability as the express lanes optimize the corridor capacity by providing a new choice to drivers. Single occupancy vehicles (SOVs) may choose to pay a toll and travel within the express lanes, while carpools, clean-air vehicles, motorcycles, and transit vehicles enjoy the benefits of toll-free travel in the express lanes.

An All Electronic Toll (AET) collection method has been employed to collect tolls. Toll rates are calculated based on real-time traffic conditions (speed and volume) in express and general purposes lanes and can change as frequently as every three minutes. California Highway Patrol (CHP) officers provide enforcement services and the California Department of Transportation (Caltrans) provides roadway maintenance services through reimbursable service agreements.

January 2018 Operations Update:

Nearly 648,000 express lane trips were recorded during operational hours in January, an average of approximately 29,400 daily trips. Table 1 presents the breakdown of trips based on toll classification and direction of travel. Pursuant to the Commission-adopted "Ordinance for Administration of Tolls and Enforcement of Toll Violations for the I-580 Express Lanes," if a vehicle uses the express lanes without a valid FasTrak® toll tag then the license plate read by the Electronic Tolling System is used to either assess a toll either by means of an existing FasTrak account to which the license plate is registered or by issuing a notice of toll evasion violation to the registered vehicle owner. Approximately half of all trips by users without a toll tag are assessed tolls via FasTrak account.

Table 1. Express Lane Trips by Type and Direction

Trip Classification		Percent of Trips[1]
		January
By Type	HOV-eligible with FasTrak flex tag	45%
	SOV with FasTrak standard or flex tag	37%
	No valid toll tag in vehicle	18%
By Direction	Westbound	45%
	Eastbound	55%

1. Excludes "trips" by users that had no toll tag and either no license plate or one that could not be read by the Electronic Tolling System with sufficient accuracy that a toll could be assessed.

Express lane users typically experience higher speeds and lesser lane densities than the general purpose lanes. Lane density is measured by the number of vehicles per mile per lane and reported as Level of Service (LOS). LOS is a measure of freeway performance based on vehicle maneuverability and driver comfort levels, graded on a scale of A (best) through F (worst). Table 2 summarizes the average speed differentials and LOS comparison between the express and general purpose lanes at four locations in each of the westbound and eastbound directions during respective commute hours for January. This table provides an overall snapshot of the express lane benefits for the month during commute hours.

Attachment B presents the speed and density heat maps for the I-580 corridor during revenue hours for the six-month period from July 2017 – December 2017. These heat maps are a graphical representation of the overall condition of the corridor, showing the average speeds and densities along the express lane corridor and throughout the day for both the express and general purpose lanes, and are used to evaluate whether the express lane is meeting both federal and state performance standards. During these six months, the average speeds at each traffic sensor location in the westbound express lane ranged from 55 to 70 mph during the morning commute hours (5 am to 11 am) with the lower speeds occurring between Isabel Avenue and Hacienda Road. The express lane operated at LOS C or better at most times, with a short one-hour period of LOS D experienced near Fallon Road and Isabel Ave in the morning commutes. By comparison, the general purpose lanes experienced average speeds as low as 40 mph and LOS D throughout longer sections of the corridor. During the evening commute, the data reflects a small period of westbound reverse-commute congestion between Hacienda Road and San Ramon Road from 4 pm to 6 pm, though the express lane continued to operate at LOS B or better during this time. Outside of the commute hours, westbound express lane users experience average speeds of 70 mph or higher and average LOS A.

Table 2. Speed Differentials and Level of Service

	Direction	I-580 in the Vicinity of	Speed Differential Range (mph)	Average Speed Differential (mph)	Average Express Lane LOS	Average General Purpose Lane LOS
January	Westbound Morning Commute: 5 am – 11 am	North First Street	4 - 7	5	B	C
		North Livermore Ave	4 - 6	5	B	C
		Fallon Road	3 - 8	6	B	C
		Santa Rita Road	13 - 17	15	B	C
	Eastbound Evening Commute: 2 pm – 7 pm	Hacienda Drive	16 - 25	21	C	E
		Airway Blvd	8 – 11	9	B	D
		North Livermore Ave	3 – 11	8	B	D
		North First Street	8 - 18	14	B	E

In the eastbound direction, average express lane speeds from July 2017 through December 2017 ranged from 25 to 70 mph during the evening commute hours (2 pm – 7 pm) with the lowest speeds occurring at the eastern terminus of the express lanes, between Vasco Road and Greenville Road. Average express lane speeds throughout the rest of the day exceeded 70 mph. Most of the express lane corridor operates at LOS C or better during the evening commute hours, with limited sections of degraded LOS at the

western end of the express lanes between 3 pm and 6 pm and at the eastern terminus between 4 pm and 7 pm. The express lanes averaged LOS B or better throughout the rest of the day in all locations. By comparison, the general purpose lanes experienced lower speeds and degraded levels of services for longer periods of time than the express lane during the evening commute hours.

Table 3 presents the maximum posted toll rates to travel the entire corridor in each direction, along with the average toll assessed to non-HOV users.

Table 3. Toll Rate Data

Month	Direction	Maximum Posted Toll (Travel Entire Corridor)	Average Assessed[1] Toll (All Toll Trips)
January	Westbound	$10.50 (1 of 22 days)	$2.21
	Eastbound	$9.50 (11 of 22 days)	$3.28

[1] Assessed toll is the toll rate applied to non-toll-free trips and reflects potential revenue generated by the trip. Not all potential revenue results in actual revenue received.

During Fiscal Year 2017-18, the I-580 Express Lanes have recorded nearly 4.71 million total trips. Total gross revenues received include $6.83 million in toll revenues and $2.15 million in violation fees and penalties.

Staff is coordinating education and outreach with partner agencies including CCTA, MTC, 511 Contra Costa as well as local CMAs to promote consistent messaging and accessible information about the I-580, I-680 Sunol, and the I-680 Contra Costa County express lanes, which opened on October 9, 2017.

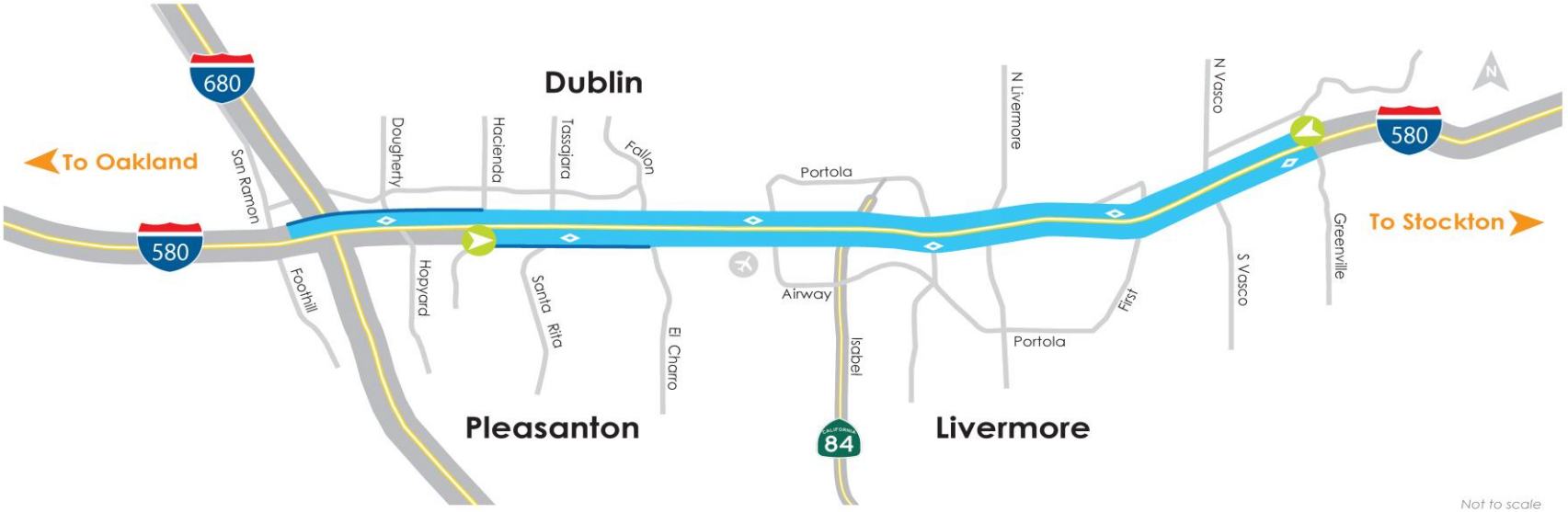
Fiscal Impact: There is no fiscal impact associated with the requested action.

Attachments

A. I-580 Corridor Express Lane Location Map
B. I-580 Corridor Heat Maps July 2017 – December 2017

I-580 Express Lanes Project Location Map

5.2A



Two Eastbound Express Lanes

Lanes begin at Hacienda

No entry/exit from eastbound express lanes from Hacienda to Fallon / El Charro.

Please note: For access to Santa Rita Road, do not enter express lanes.

One Westbound Express Lane

Lane begins at Greenville

No entry/exit from westbound express lane from Hacienda to end.

Please note: For access to I-680 or Dougherty, exit express lane before Hacienda.

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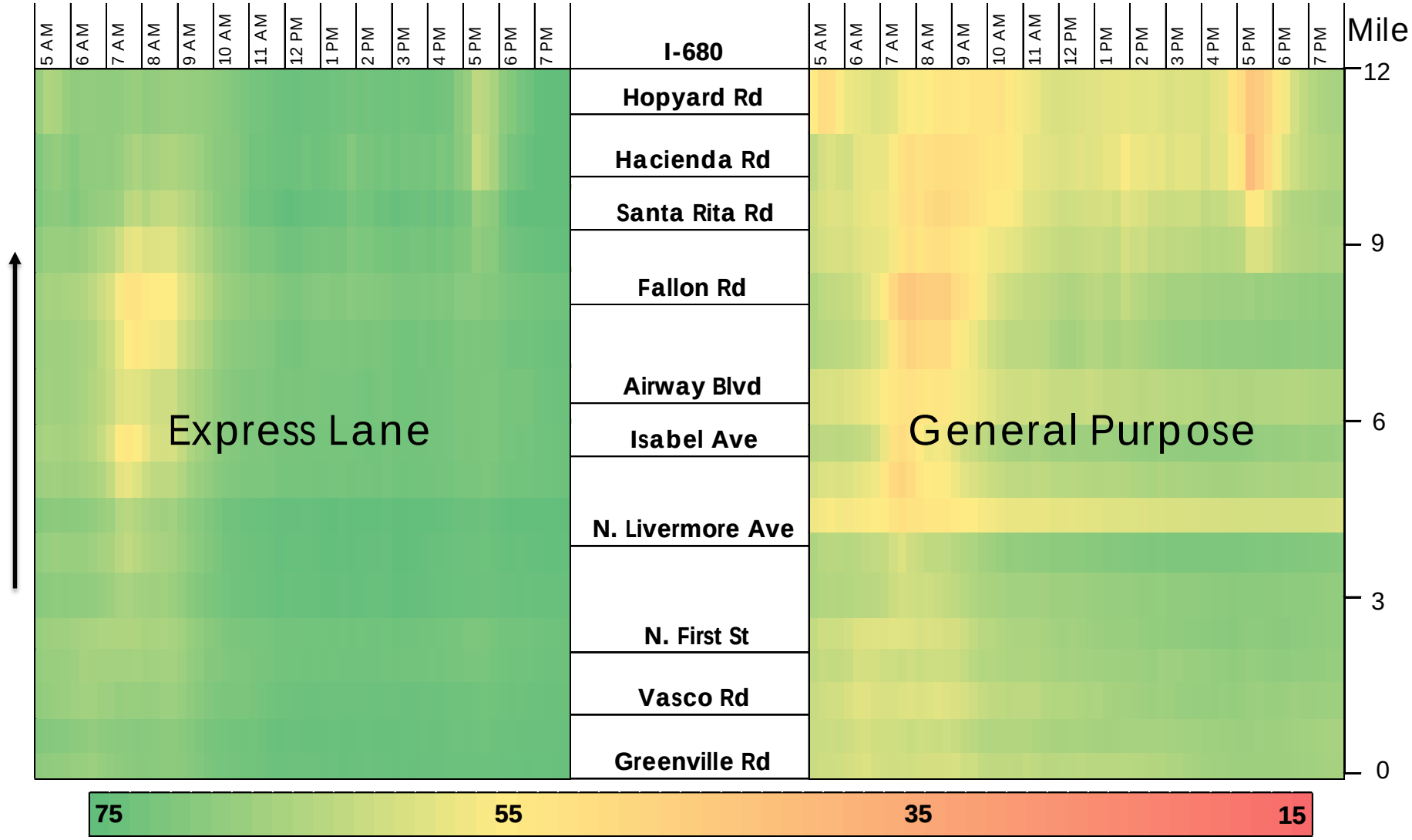
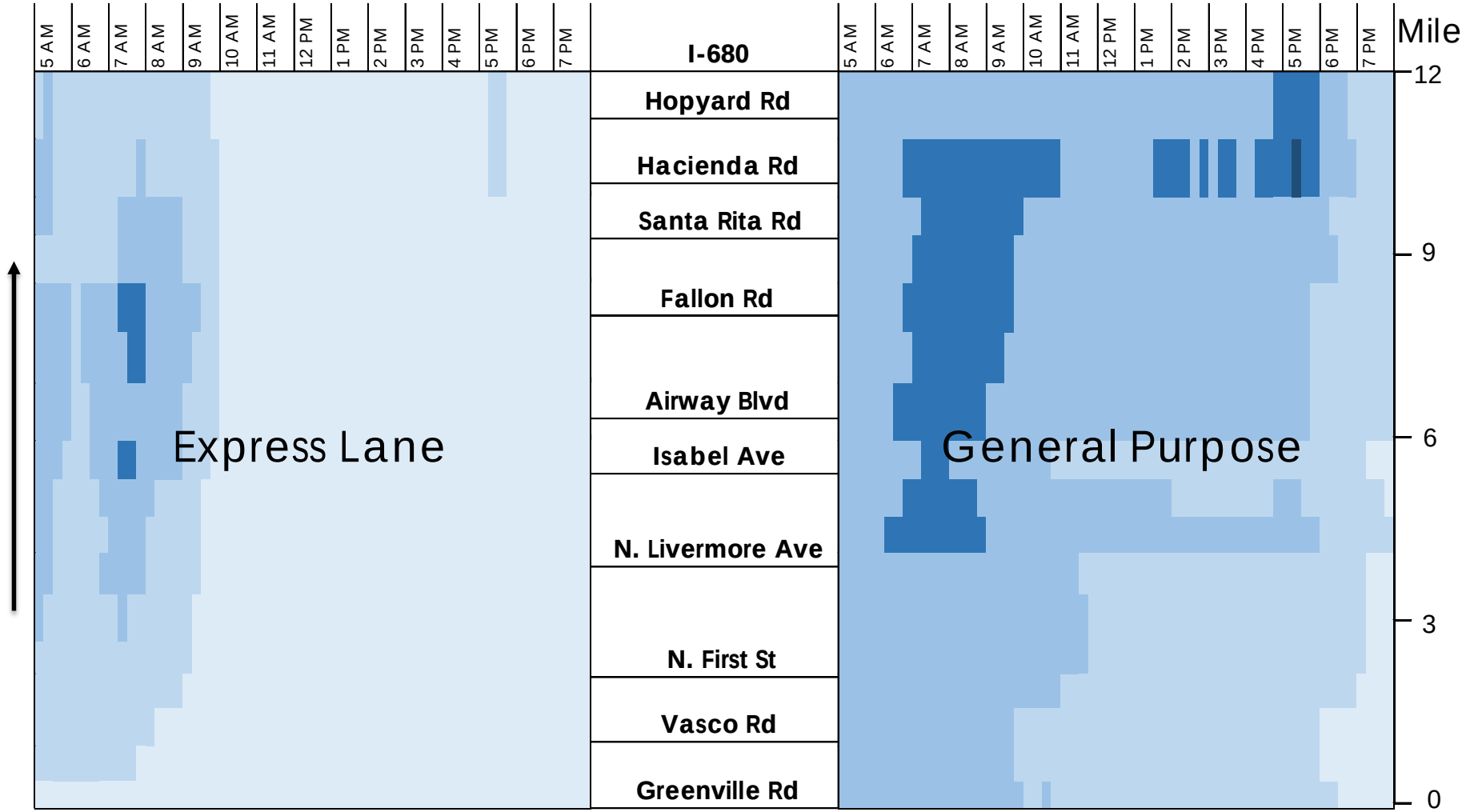
Westbound I-580 Corridor Speed Heat Maps

Monday-Friday, July 2017 – December 2017



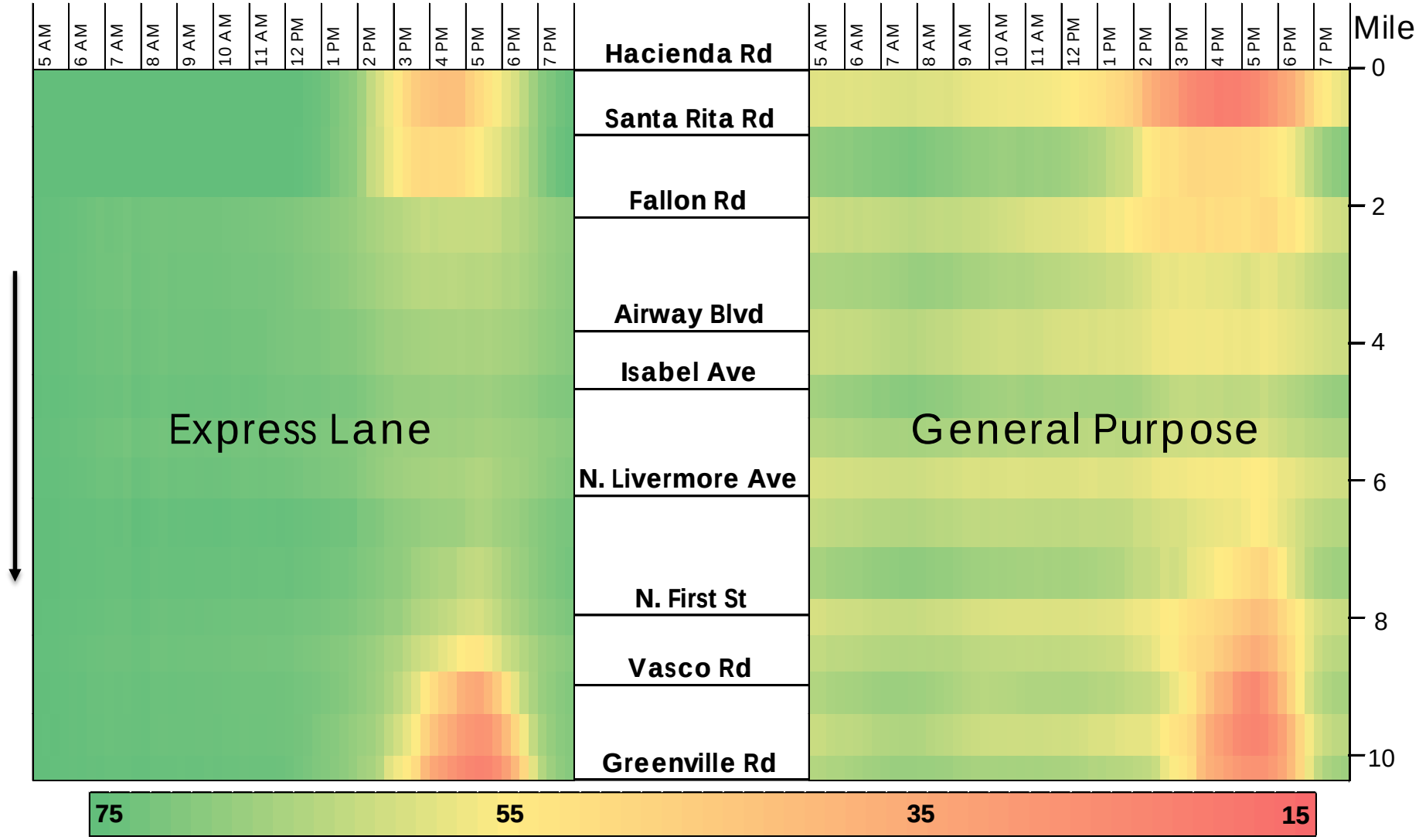
Westbound I-580 Corridor Density Heat Maps

Monday-Friday, July 2017 – December 2017



Eastbound I-580 Corridor Speed Heat Maps

Monday-Friday, July 2017 – December 2017



Eastbound I-580 Corridor Density Heat Maps

Monday-Friday, July 2017 – December 2017