



Orange County Transportation Authority

2017 Managed Lanes Workshop Questions and Answers

Regional Express Lane Plans

1. **How reasonable is it to assume that the express lane plans developed by the Los Angeles County Metropolitan Transportation Planning Authority (Metro) will be implemented in the proposed time frames?**

Answer: It seems likely that Metro will make significant progress implementing their Express Lanes strategy, considering that Los Angeles County's Measure M has over \$850 million identified for the Tier 1 Express Lane projects, and that the Metro Board of Directors has authorized their Chief Executive Officer to initiate planning studies and to seek tolling authority from the California Transportation Commission (CTC).

2. **What is the timing for the California Department of Transportation (Caltrans) District 12 proposed express lane network? How were the priorities determined?**

Answer: To determine the priority corridors for priced managed lanes, Caltrans took into consideration:

- 1) High-occupancy vehicle (HOV) degradation
- 2) Speed and delay on general purpose lanes
- 3) Financial feasibility
- 4) Consistency with the existing and planned system
- 5) Potential for conflicts with stakeholders and existing policies
- 6) Independent function of the corridor

Express Lane Impacts on Corridor Throughput

3. **Clarify the speed-flow curve from Robert Poole's presentation?**

Answer: The primary purpose of the chart (Exhibit A) was to demonstrate that freeway speeds (miles per hour {mph}) decrease as freeway volumes increase (vehicles per lane per hour) over time. In practice, freeway traffic conditions typically reach a practical maximum in volume and speed. Past maximum points, the lanes become congested, speeds fall, and the slower moving vehicles result in reduced volumes during that time period. In real world conditions, the practical maximum for volume and speed varies by location. Differences in the number and width of lanes, width of inside and outside shoulders, degree of vertical and horizontal curves, percentage of truck traffic, and driver behavior can all impact traffic speeds and volumes.

The 91 Express Lanes uses congestion management pricing to optimize traffic at free-flowing speeds. To accomplish this, hourly traffic volumes are continually monitored, toll adjustments are triggered through increases and decreases in traffic demand and may move up or down. Orange County Transportation Authority's (OCTA) adopted toll policy includes a maximum capacity at 60 mph to ensure reliable and consistent travel time. Express lanes customer complaints rise when travel speeds are unreliable and inconsistent.



4. In order to maximize throughput on the managed lanes, and provide relief to the general purpose lanes, shouldn't the managed lanes be priced at 45 mph?

Answer: Unreliable travel times and less desirable customer experiences start when volumes increase and speeds drop below 60 mph. Priced managed lanes require predictability in order to provide a consistent user experience. Operating at 45 mph would introduce delay (i.e., speeds below 60 mph) and a less predictable customer experience.

5. How can we maximize throughput of the entire corridor, especially at interchanges and during off-peak hours?

Answer: The State Route 91 (SR-91) corridor has limited opportunities to expand capacity at interchanges without significant right-of-way impacts. The 91 Express Lanes toll policy permits lowering tolls when capacity is available.

6. Is there consensus on the concept that express lanes improve overall corridor performance?

Answer: For congested corridors, the consensus from the panel was that express lanes do improve the performance of the overall corridor.

7. If a general purpose lane is converted to a managed lane, would corridor performance improve?

Answer: This question was not directly addressed by the presenters. However, Mr. Poole presented data from Interstate 95 in Miami that suggests that a facility with managed lanes does operate better than if that same facility operated all of the lanes as general purpose (Exhibit B). However, conversion of existing general purpose lanes to managed lanes is not a consideration by OCTA or Caltrans. Federal policy discourages this type of conversion on the interstate system.

Funding

8. What funding sources were used to construct Orange County's HOV network?

Answer: Measure M1 (1990 to 2011) funds contributed to the addition of about 130 HOV lane miles on Orange County freeways. Measure M2 funds (2011 to 2041) are contributing to approximately 20 additional lane miles of planned HOV projects. Including planned projects, Measure M funds will have contributed to about 57% of the Orange County HOV system's total lane miles. The HOV system has, and continues to also benefit from significant funding from the federal Congestion Mitigation and Air Quality (CMAQ) program, and a variety of other state and federal funding sources.



9. Question: Would the use of SB 1 (Chapter 5, Statutes of 2017) funding to construct/implement express lanes be inconsistent with OCTA's current Express Lane Planning and Implementation Principles?

Answer: The OCTA Express Lane Planning and Implementation Principles (principles) were adopted in 2011, and staff is now reviewing the principles for a potential update, per Board direction. Currently, the principles do not address funding considerations for express lane projects. However, OCTA's Capital Programming Policies (last updated in May 2017) not only prioritize the use of state and federal funds for Measure M projects, but they also allow consideration for projects that are complementary to Measure M and its goals. There are no specific exclusions for express lanes in the policies.

10. Can SB 1 funds be used for capacity projects other than managed lanes?

Answer: There are programs within SB 1 that could potentially be used for general purpose capacity projects. Exhibit C includes a summary of potential projects matched to SB 1 programs.

11. If OCTA determined that Congested Corridors funds shouldn't be used for managed lanes or express lanes in Orange County, would OCTA be a "donor county"?

Answer: The congested corridors program does not focus solely on managed lanes. The program goals included providing more transportation choices for residents, commuters, and visitors through a balanced set of improvements. As such, the program has a multi-modal focus, and OCTA's future funding application is likely to include many solutions to a congested corridor (e.g., highway, street, transit, and bikeway improvements). Given high congestion levels and a multimodal focus, it is likely that Orange County will receive some level of funding through this SB 1 Program.

12. How much funding is needed to maintain the highway system? If funds that have been diverted were returned to transportation, would that along with SB 1 be enough?

Answer: Prior to SB 1, Caltrans projected a \$57 billion shortfall for the State Highway Operations and Protection Program (SHOPP) over the next ten years. SB 1 is projected to provide roughly \$54 billion statewide over the next ten years, but only about \$15 billion goes to SHOPP. Much of the remainder goes toward maintenance of local roadways, as well as to transit and other transportation improvement programs (i.e. Congested Corridors, Trade Corridors, Local Partnership, etc.).

Funds currently being diverted to pay transportation-related debt include the truck weight fees and other revenues from interest, rents, sale of property, etc. The truck weight fees that are being diverted make up about \$1 billion/year, and are currently being backfilled by the price-based portion of the excise gasoline tax. The truck weight fees are a significant revenue source, but insufficient to meet projected SHOPP needs.



State and Federal Policies

13. Is the state or federal government going to require HOV 3+, or will it be a regional decision?

Answer: The federal government requires that the performance standard be met, but it is up to the regions and state to work together to determine the operational policies to achieve the federal standards. At this time, the state is working with regional agencies to consider increasing the HOV policy to 3+ on a case-by-case basis, but not as a statewide requirement.

14. If the expectation at the federal level was to operate carpool lanes at HOV 3+, what was the reason for the California exception for HOV 2+?

Answer: It was determined that the demand for HOV 3+ was too low at the time the HOV system began to be developed in Orange County. Therefore, to help ensure that HOV lanes provided a benefit to the system, Caltrans worked with Federal Highway Administration (FHWA) to allow HOV 2+ for almost all corridors in the state.

15. Is the state unwilling to add general purpose lane capacity?

Answer: The state is willing to consider additional general purpose lanes, and these decisions occur through the project development process. The environmental process includes selection of a preferred alternative that meets the purpose and need of the project.

16. Would the FHWA and State of California object to the conversion of HOV lanes to general purpose lanes?

Answer: States are not authorized to convert an HOV lane to a general-purpose lane if funds to construct the facility were made available under the CMAQ improvement or the Interstate Maintenance Programs. Other federal funding sources may have similar requirements that limit the ability of operating agencies to change HOV/High-Occupancy Toll lanes to general-purpose lanes.

Related Factors and Alternative Strategies

17. What impact will technology have on driving behavior in relation to the speed curve from Mr. Poole's presentation?

Answer: Autonomous/connected vehicles are expected to change the curve, allowing higher volumes to travel at higher speeds. However, the timeframe for these technologies is uncertain, and many professionals believe that autonomous/connected vehicles will induce more travel and increase traffic volumes. Current estimates suggest that 50 percent of vehicles operating on a given facility would need to be autonomous/connected before gaining any significant capacity



benefits. That said, operations could improve at a lower mix of autonomous/connected vehicles due to safer slowing/breaking reactions that avoid more sudden starts and stops that often lead to congestion.

18. Wouldn't sufficient housing unburden the transportation system?

Answer: More housing in Orange County would help reduce trip lengths and congestion on key travel corridors such as SR-91 and State Route 57. The current imbalance in workforce housing increases distances between where individuals live and work, increasing wear-and-tear on freeways and streets, leading to greater vehicle dependence, longer commutes, increased vehicle miles traveled, and air quality impacts. This issue is being tackled on several fronts including the Orange County Business Council's (OCBC) initiative to evaluate local agencies' progress to increase housing for Orange County's workforce as well as regional efforts by the Southern California Association of Governments (SCAG). More information on the OCBC effort can be found at: <https://www.ocbc.org/ocbc-initiatives/workforce-housing>, and more information on SCAG's efforts can be found at: <http://www.scag.ca.gov/programs/Pages/Programs/HousingLandUse.aspx>.

19. Does Elon Musk's tunneling concept have realistic potential?

Answer: It is too early to say given the amount of research, testing, and regulatory approvals necessary to move this concept forward. Musk has formed a company to develop more cost-effective tunneling technology that could reduce tunnel diameters and increase the speed of the tunnel boring machines. This effort would be coupled with development of electric-powered moving platforms that move cars within the tunnel system. These technologies are under development by Musk's company, and future deployment remains uncertain at the present time.

20. What congestion solutions should be considered, other than managed lanes?

Answer: Other potential solutions come in the form of new technologies, such as autonomous/connected vehicles, expanded use of telecommuting (through advancement in communication and networking technologies), and expanded ridesharing (through advancements and expanded use of apps and services that make ridesharing more convenient). In addition, enhanced and expanded intelligent transportation systems (i.e., signal synchronization and integrated corridor management) can help manage travel demand.



Transportation Corridor Agencies

21. Don't the Transportation Corridor Agencies (TCA) facilities already provide priced managed lanes?

Answer: According to FHWA, priced managed lanes operate within a freeway and alongside general purpose lanes, and are actively managed through the use of pricing and occupancy requirements to provide users consistent and predictable travel times. Managed lanes are separated from general purpose lanes by differentiating pavement striping or physical barriers, with entry and exit at designated locations. TCA facilities utilize pricing to generate revenue and manage demand, but these facilities do not meet FHWA's definition of priced managed lanes.

22. What happens when the TCA system is turned over to Caltrans in 2053?

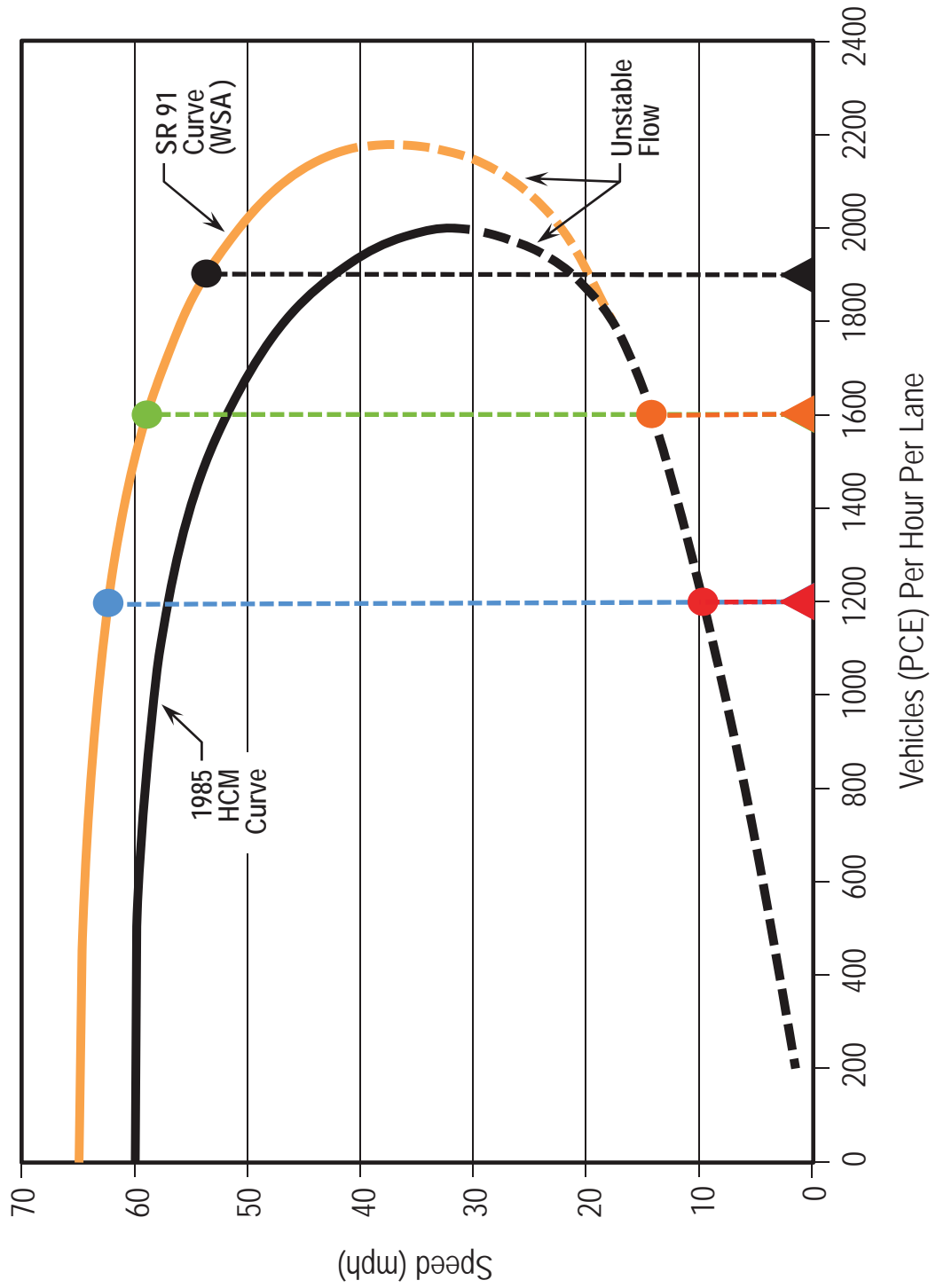
Answer: Once these facilities are turned over to Caltrans, it would be possible to open most of the lanes as general purpose, and maintain some managed lanes that could be operated as HOV or express lanes.

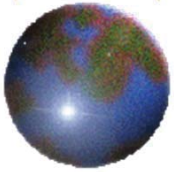
23. How can we partner better with the TCA?

Answer: As the transportation planning agency for Orange County, OCTA uses the Long-Range Transportation Plan (LRTP) as the framework for working with other agencies, such as the TCA, for comprehensive, cooperative, and continuous planning. OCTA is underway with the 2018 LRTP, and this plan is the first step in defining projects and programs to address Orange County's mobility needs. Beyond the LRTP, corridor plans and subsequent project development efforts provide opportunities to work toward consensus among stakeholders and decision makers.

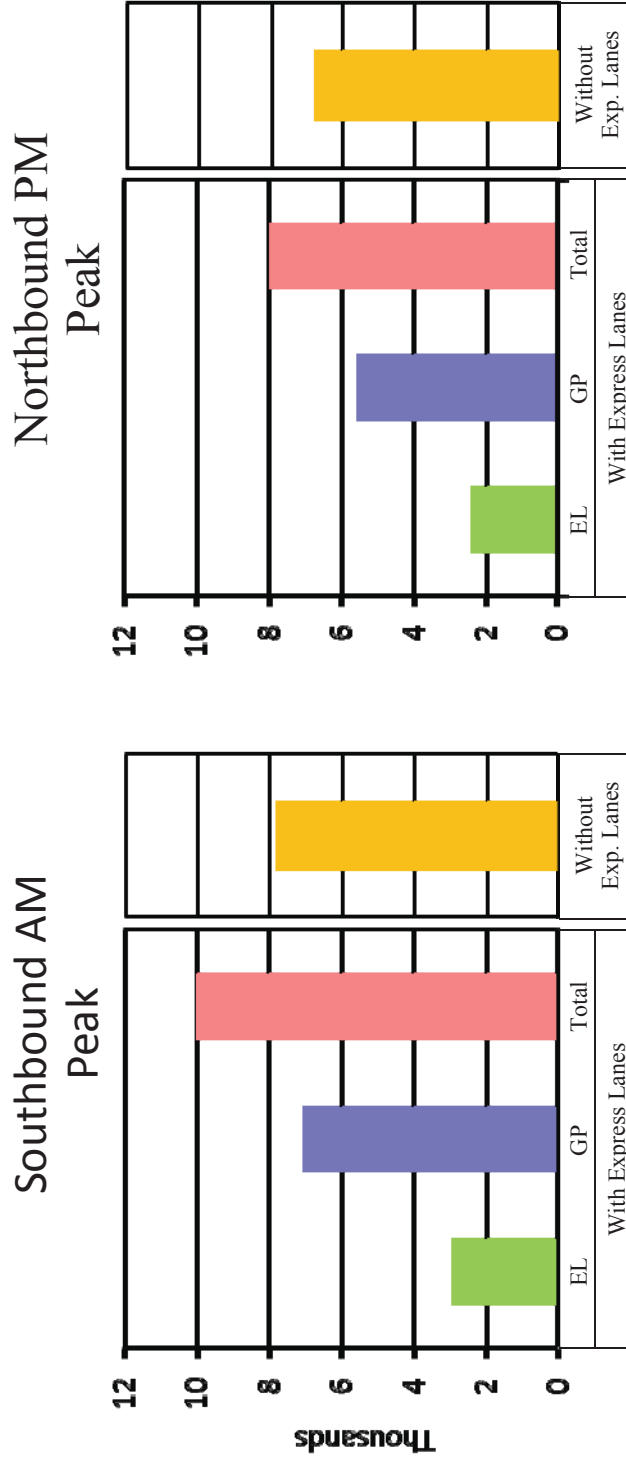


Pricing enables uncongested traffic flow.





I-95 Miami throughput comparison



Source: FDOT / Kimley-Horn; Cambridge Systematics

2017 Funding Needs Assessment - Orange County Transportation Authority Near Term Projects										
Sponsor Agency	Project Title	ATP	LPP - C	SCC	T	TCEP	TIRCP	Total Project Cost (\$1,000's)	Committed Funding (\$1,000's)	Funding Need (\$1,000's)
State Highway										
OCTA	I-5 Widening (SR-73 to El Toro Road) Segments 1, 2, and 3 ¹		X	X	X			\$481,589	\$213,273	\$268,316
OCTA	SR-55 Widening from I-405 to I-5		X	X	X			\$375,932	\$ 65,123	\$310,809
OCTA	I-5 / El Toro Interchange Improvements		X		X			\$113,000	\$ 4,400	\$108,600
OCTA	I-5 Widening from I-405 to SR-55		X		X			\$720,870	\$ 8,050	\$712,820
OCTA	SR-55 Widening from I-5 to SR-91		X		X			\$227,350	\$ 5,000	\$222,350
OCTA	SR-57 Widening from Orangewood Avenue to Katella Avenue		X		X			\$ 47,690	\$ 2,500	\$ 45,190
OCTA	SR-91 Widening from SR-57 to SR-55		X		X			\$456,190	\$ 9,050	\$447,140
OCTA	I-405 Widening from I-5 to SR-55		X		X			\$323,600	\$ 8,050	\$315,550
OCTA	I-605 / Katella Avenue Interchange Improvements		X		X			\$ 29,600	\$ 1,200	\$ 28,400
Transit										
OCTA	OC Streetcar - New Transit Line Between Santa Ana Regional Transportation Center and a New Transit Center in Garden Grove ²		X	X				\$299,342	\$150,387	\$171,705
OCTA	Orange County Rail Maintenance Facility		X	X	X	X		TBD	\$ 14,451	TBD
OCTA	Bravo Route 529 - Operating and Capital Cost for Limited Bus Stop Service on Beach Boulevard including signal priority			X			X	\$ 15,600	\$ -	\$ 15,600
OCTA	Transit Security Operations Center ³						X	\$ 35,000	\$ 5,923	\$ 29,077
OCTA	Future Priority Bus Corridor Improvements - Capital and Operating Costs			X			X	TBD	\$ -	TBD
OCTA	Pass and Fare Subsidy Programs							TBD	\$ -	TBD
OCTA	Rail Signal Respacing		X	X			X	\$ 6,500	\$ -	\$ 6,500
OCTA	On Demand Transit Operations - 3 years Starting February 2018							\$ 1,500	\$ -	\$ 1,500
Goods Movement										
Caltrans	SR-57 Truck Climbing Lane Addition from Lambert Road to County Line		X	X	X	X		\$167,550	\$ -	\$167,550
City of Brea	SR-57 / Lambert Road Interchange Improvements		X	X	X	X		\$ 72,500	\$ 25,700	\$ 46,800
Local Arterials/Rail - Grade Separations										
OCTA	17th Street Grade Separation		X	X	X			\$158,000	\$ 3,500	\$154,500
OCTA	State College Boulevard Grade Separation (Los Angeles-San Diego-San Luis Obispo)		X	X	X			\$178,000	\$ 46,000	\$132,000
OCTA	Traffic Signal Improvements		X	X	X			TBD	TBD	TBD
Active Transportation										
Various	OC Loop - 66 miles of Seamless Bicycle and Pedestrian Connections	X		X	X			\$176,400	\$ 96,000	\$ 80,400
Various	OC Active - Regional Bicycle and Pedestrian Projects	X		X	X			TBD	TBD	TBD

1 - I-5 widening from SR-73 to Oso Parkway has \$78.030 million in STIP funds in a later year than the project schedule would dictate. SB 1 will allow the advancement of these projects.

2 - Funding need includes \$148.955 million in federal New Starts funding. New Starts funding is not committed until the full funding grant agreement is executed.

3 - Includes dispatch for OC Streetcar

*Acronyms listed on next page

ATP - Active Transportation Program
LPP-C - Local Partnership Program - Competitive
SCC - Solutions for Congested Corridors
TCEP - Trade Corridor Enhancement Program
TIRCP - Transit and Intercity Rail Capital Program
OCTA - Orange County Transportation Authority
I-5 - Interstate 5
SR-73 - State Route 73
SR-55 - State Route 55
I-405 - Interstate 405
SR-91 - State Route 91
SR-57 - State Route 57
I-605 - Interstate 605
TBD - To Be Determined
N/A - Not Available
LOSSAN - Los Angeles - San Diego - San Luis Obispo Rail Corridor
STIP - State Transportation Improvement Program