



DESIGNING TOMORROW

2018 LONG-RANGE TRANSPORTATION PLAN

Executive Summary

November 2018

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2018 Long-Range Transportation Plan

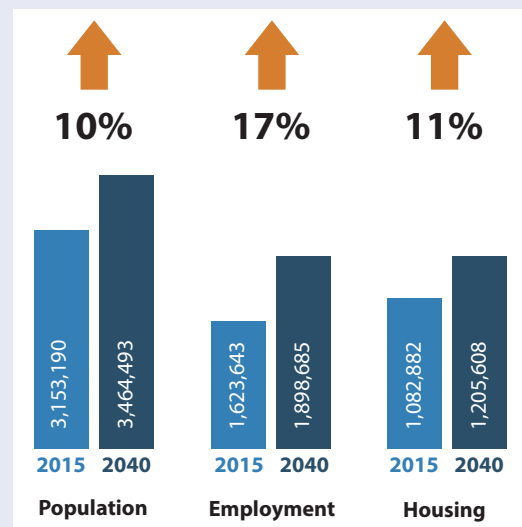
Executive Summary

The Orange County Transportation Authority (OCTA) was created in 1991 through the consolidation of seven separate transportation planning agencies. Since that time, Orange County has transformed from a Los Angeles bedroom community to a vibrant, independent economy of its own. OCTA played a major role in this growth by keeping residents and commuters moving throughout Orange County's 34 cities and the unincorporated County areas. This is exemplified through successful implementation and operation of transportation projects and services over the years, including well over 1 billion bus passenger trips, approximately 62 million Metrolink passenger trips, in excess of 200 miles of freeway lanes constructed, and 2,000 synchronized traffic signals.

In order to accommodate future growth in population, employment, and housing, OCTA must continue to improve upon the existing transportation system. Within this setting, transportation leaders have worked with the general public and partner agencies to develop *Designing Tomorrow*, Orange County's long-range transportation plan to keep its transportation systems operating efficiently, effectively, and in keeping with the needs and desires of its residents.

2040 No Build Conditions

Analysis by the Center for Demographic Research shows Orange County's population, employment, and housing are expected to continue growing for the foreseeable future. To understand how much of an impact the projected growth will have on the transportation system, OCTA analyzed a scenario referred to as 2040 No Build. This scenario considers how the transportation system would operate in 2040 if no investments or changes were made after 2015. The result showed that without additional transportation improvements, the percent of time spent in traffic will increase 41 percent as average speeds decline on Orange County's highways and roadways by approximately six percent. The performance of this 2040 No Build scenario is shown below in comparison to 2015 conditions.



TRANSPORTATION SYSTEM PERFORMANCE SUMMARY (2015 TO 2040)

Performance Metric	2015 Base Year	2040 No Build
Delay as a percent of travel time	15.2%	21.4%
Freeways - AM peak average speed (mph)	38.3 miles per hour	36.2 miles per hour
Arterials - AM peak average speed (mph)	25.7 miles per hour	24.3 miles per hour

Note: AM peak refers to the period between 6AM and 9AM

What is a Long-Range Transportation Plan (LRTP)?

Designing Tomorrow, OCTA's vision for mobility over the next 20+ years, is known as a long-range transportation plan. Orange County's long-range transportation plan is updated every four years to reflect changing demographics, economic trends, and mobility needs. It also serves as Orange County's input into regional planning efforts for southern California.

The Southern California Association of Governments (SCAG) is required by the state of California and the federal government to develop a Regional Transportation Plan/Sustainable Communities Strategy, also every four years. Orange County's transportation projects must be included in the Southern California Regional Transportation Plan/Sustainable Communities Strategy in order to be eligible for federal and state funding, and to progress through design and construction.

Establishing the Framework for the Long-Range Transportation Plan

Creating transportation solutions for the future requires developing and analyzing a range of scenarios, and ultimately defining a preferred transportation plan. The plan must take into account the many challenges facing a county that is continuing to grow. *Designing Tomorrow* does just that – it contains a set of goals that considers financial constraints, shifting interest in modes of transportation, and environmental regulations. It also supports exploring opportunities that come with the emergence of new technology and innovation that could substantially change the face of transportation in the next 20+ years.

Challenges

- High Cost of Housing
- Limited Land for System Expansion
- Transportation Funding Uncertainties
- Evolving Transit Market
- Disruptive Technologies
- Challenging Emission Standards

Goals

- Deliver on Commitments
- Improve System Performance
- Expand System Choices
- Support Sustainability

The 2040 Improvement Plan

The growing travel demand highlighted in the 2040 No Build scenario is addressed through a financially-constrained multi-modal strategy in the Trend 2040 scenario. This scenario delivers on OCTA's commitments, improves system performance, expands transportation choices, supports sustainability, and aligns with stakeholder input. A listing of the Trend 2040 projects is shown in the tables on the following pages.

TREND 2040 PROJECT LIST - HIGHWAY PROJECTS

Corridor	Description	Regular Lanes	HOV Lanes	Express Lanes	Toll Roads	Inter-change
Measure M Projects						
I-5	Project A – Add one HOV in each direction from SR-55 to SR-57, plus auxiliary lanes as needed		X			
I-5	Project B – Add one regular lane NB from truck bypass on-ramp to SR-55; Add one regular lane SB from SR-55 to Alton Parkway; improve merging	X				
I-5	Project C – Add one regular lane in each direction from SR-73 to Alicia Parkway, and one HOV lane each in direction from Alicia Parkway to El Toro Road, and improve La Paz Road and Avery Parkway interchanges	X	X			X
I-5**	Project C – Add one HOV in each direction from Pacific Coast Highway to Avenida Pico, and reconfigure interchange at Avenida Pico		X			X
I-5	Project D – Improve access and merging in the vicinity of El Toro Road					X
SR-55	Project F – Add one regular lane and one HOV lane in each direction from I-405 to I-5, and fix chokepoints	X	X			
SR-55	Project F – Add one regular lane in each direction and fix chokepoints from I-5 to SR-22; make other operational improvements from I-5 to SR-91	X				
SR-57	Project G – Add one regular lane NB between Orangewood Avenue and Katella Avenue	X				
SR-57	Project G – Add one NB truck climbing lane from Lambert Road to Los Angeles County line	X				
SR-91**	Project H – Add one regular lane WB from I-5 to SR-57	X				
SR-91**	Project I – Add one regular lane WB from SR-55 to Tustin Avenue	X				

*Under construction

**Completed since 2015

NB - Northbound

SB - Southbound

EB - Eastbound

WB - Westbound

TREND 2040 PROJECT LIST - HIGHWAY PROJECTS CONTINUED

Corridor	Description	Regular Lanes	HOV Lanes	Express Lanes	Toll Roads	Inter-change
Measure M Projects						
SR-91	Project I – Add one regular lane EB from SR-57 to SR-55; add one regular lane WB from SR-57 NB connector to State College Boulevard; improve interchanges and merging from Lakeview Avenue to Raymond Avenue	X				
SR-91	Project J – Add one regular lane in each direction from SR-241 to county line	X				
I-405*	Project K – Add one regular lane each direction from I-605 to SR-73 and provide additional capital improvements	X				
I-405	Project L – Add one regular lane in each direction from I-5 to SR-55, and add SB auxiliary lane from SR-133 to Irvine Center Drive	X				
I-605	Project M – Improve interchange at Katella Avenue					X
	Project N – Freeway Service Patrol					
Additional Projects						
I-5	Add one HOV lane in each direction from SR-57 to SR- 91		X			
I-5	Add one HOV lane in each direction from Avenida Pico to San Diego County line		X			
I-5	Barranca Parkway HOV interchange improvement - Add SB HOV on-ramp and northbound HOV off-ramp					X
SR-57	Interchange Improvement at Lambert Road					X
SR-73	Add one HOV lane in each direction from MacArthur Boulevard to I-405		X			
SR-91	Construct overcrossing and interchange at Fairmont Boulevard					X
SR-91	Express Lanes - Operations and maintenance					
I-405*	Add one express lane in each direction from I-605 to SR-73, convert existing HOV to HOT, and provide additional capital improvements			X		
I-405	Add auxiliary lanes from University Drive to Sand Canyon Ave, and from Sand Canyon Ave to SR-133	X				

*Under construction
 **Completed since 2015

NB - Northbound
 SB - Southbound

EB - Eastbound
 WB - Westbound

TREND 2040 PROJECT LIST - HIGHWAY PROJECTS CONTINUED

Corridor	Description	Regular Lanes	HOV Lanes	Express Lanes	Toll Roads	Inter-change
Additional Projects						
I-405	Express Lanes – Operations and maintenance					
	Motorist services (511 service and call box network)					
Projects from Partner Agencies						
SR-241 SR-261 SR-133	Build out to three to four toll lanes in each direction from SR-91 to I-5 (via SR-261 and SR-133), plus climbing and auxiliary lanes				X	
SR-241	Build out to four to five toll lanes in each direction, plus climbing and auxiliary lanes, south of SR-133				X	
SR-73	Build out to four toll lanes in each direction, plus climbing and auxiliary lanes				X	
SR-133	Add new interchange at Trabuco Road/Great Park Boulevard (North Irvine Transportation Mitigation Program)				X	X
SR-241	Add Express Lane Connector to SR-91 Express Lanes			X	X	X
SR-91	RCTC to add one regular lane from county line to SR-71	X				

TREND 2040 PROJECT LIST - STREETS AND ROADS

Corridor	Description
Measure M Projects	
Countywide	Project O – Master Plan of Arterial Highways build out
Grade Separations**	Project O – Grade separations along BNSF corridor at Raymond Ave and State College Boulevard
Countywide	Project P – Signal synchronization program
Additional Projects	
Countywide	Arterial Pavement Rehab
Grade Separations	Along LOSSAN corridor at 17th Street, State College, and Santa Ana Boulevard
Countywide	OC Bikeways

**Under construction*

***Completed since 2015*

TREND 2040 PROJECT LIST - TRANSIT

Description
Measure M Projects
Project R – Metrolink Capital – Supports service increase from 54 to 86 weekday trains
Project R – Metrolink Service Expansion Program station improvements
Project S – OC Streetcar
Project U – Senior Mobility Program
Project U – Senior Non-Emergency Medical Transportation Program
Project W – Safe Transit Stops
Additional Projects
OC Bus 360° – Bus Efficiency Strategy
North Harbor Corridor – High-quality transit between Cal State Fullerton and the Santa Ana Regional Transportation Center
17th/Westminster & Bristol Corridor – High-quality transit between the Goldenwest Transportation Center and the University of California, Irvine
South Harbor Corridor – High-quality transit between 17th/Westminster and Hoag Hospital Newport Beach
Bristol & State College Corridor – High-quality transit between Brea Mall and Downtown Santa Ana
Beach Corridor – High-quality transit between Fullerton Park-and-Ride and Downtown Huntington Beach
La Palma Corridor – High-quality transit between Hawaiian Gardens and Anaheim Canyon Station
McFadden & Bolsa Corridor – High-quality transit between Goldenwest Transportation Center and Larwin Square
Main Corridor – High-quality transit between Anaheim Regional Transportation Intermodal Center and the South Coast Plaza Park-and-Ride
Chapman Corridor – High-quality transit between Hewes and Beach
Interstate 5 Corridor – Freeway BRT between Fullerton Park-and-Ride and Mission Viejo/Laguna Niguel Metrolink Station
State Route 55 Corridor – Freeway BRT between Santa Ana Regional Transportation Center and Hoag Hospital Newport Beach
Metrolink Operations (increase from 54 to 86 weekday trains)
OC Flex – On-demand shared-ride microtransit service
LOSSAN – Laguna Niguel to San Juan Capistrano rail passing siding
Transit Security and Operations Center
Vanpool

TREND 2040 PROJECT LIST - OTHER

Description
Measure M Projects
Project X – Transportation-related water quality program
Additional Projects
Bond Interest

The Trend 2040 scenario can be delivered within the revenues projected between 2019 and 2040, which amount to approximately \$43.4 billion. The majority of these funds (68 percent) are local sources, while state sources comprise 22 percent and federal sources make up the remaining 10 percent. The allocation of these funds was prioritized to deliver on commitments that include: completion of OC Go (also known as Measure M - Orange County's one-half cent sales tax for transportation, administered by OCTA); non-OC Go projects that have secured support and funding; as well as maintaining existing infrastructure, transit service levels, and motorist services programs. Delivering on these commitments requires about 84 percent of the available revenues.

PROPOSED TREND 2040 EXPENDITURE BY MODE

Mode	Expenditure	% of Total Cost
Transit Projects	\$18,103,197	42%
Highway Projects	\$9,646,352	22%
Local Projects	\$14,169,720	33%
Other (OC Go Environmental Programs, Bond Interest, etc.)	\$1,471,467	3%

Note: Additional investments in highway safety and maintenance projects are made by the state through the State Highway Operation and Protection Program.

Trend 2040 also includes "additional projects" (as noted in the preceding tables) that go beyond the commitments described above. These projects use the remaining 16 percent, or approximately \$7 billion, of projected funding. These discretionary funds were used to fund projects and services that further address the 2018 long-range transportation plan goals and challenges. These projects are typically selected from plans that have been publicly vetted, such as the OC Transit Vision, Regional Bikeways plans, Metrolink Strategic Plan, and locally preferred alternatives from OCTA's major investment studies.

Changing Carpool Lane Standards

The performance of the carpool lane system in Orange County is a challenge, in that it must comply with federal performance standards that are not being met today. To meet these standards, the California Department of Transportation (Caltrans) is considering exercising its authority to make operational changes that would increase the number of passengers required to three or more. Additionally, Caltrans and neighboring counties are planning to have many of these carpool lanes allow vehicles with fewer than three passengers to also use the carpool lanes for a fee. Since a significant amount of funding is at stake if the federal standards are not met, *Designing Tomorrow* evaluated the options, as shown in the chart below. It was determined that, based on what OCTA knows today, the most reasonable option is to assume that the carpool lane system will likely operate as carpool/tolled express lanes by 2040. Therefore, this was assumed in the analysis of the Trend 2040 scenario.

CARPOOL LANE PERFORMANCE SUMMARY

Metrics	Carpool 2+	Carpool 3+	Express Toll
Meets federal performance standards	✗	✓	✓
Managed lane capacity used during morning drive time	70%	30%	60%
Findings summary	Does not meet federal standard due to overuse.	Meets federal standard, but underused.	Meets federal standard and doubles use compared to carpool 3+

Achieving the Goals and Performance

Trend 2040 keeps promises made to voters through OC Go and meets the long-range transportation plan goal of **delivering on commitments**. The performance metrics below indicate that the efficiency of the Orange County transportation system improves significantly under the Trend 2040 scenario, nearly matching the 2015 Base Year despite a 10 percent increase in population and a 17 percent increase in employment. Therefore, Trend 2040 is meeting the goal of **improved system performance**. Additionally, Trend 2040 supports the goal of **expanding system choices** by investing in development of transit, active transportation, and rideshare options. Finally, Trend 2040 can be accomplished within the funds projected to be available between now and 2040, making the plan **financially sustainable** for OC taxpayers. It also includes system maintenance programs and programs to improve the quality of life for Orange County residents such as land acquisition and environmental mitigation projects that not only provide open space but also offset greenhouse gas emissions. Thus, Trend 2040 achieves financial, infrastructural, and environmental sustainability.

Taking a closer look at the performance of the Trend 2040 scenario as compared with the 2040 No Build, the percent of travel time in traffic is reduced 28 percent, while freeway and arterial speeds increase 10 percent and nearly 7 percent, respectively. Additionally, transit trips are projected to increase approximately 6 percent.

TRANSPORTATION SYSTEM PERFORMANCE SUMMARY

Metrics (daily)	2015 Base Year	2040 No Build	Trend 2040
Delay as a percent of travel time	15.2%	21.4%	15.4%
Transit trips	149,000	165,000	174,000
Freeways - AM peak average speed (mph)	38.3	36.2	39.7
Arterials - AM peak average speed (mph)	25.7	24.3	25.9

Note: Trend 2040 assumes managed lanes are operated as carpool/tolled Express Lanes by 2040

Designing in a Changing World

Advancing technologies and services, ranging from on-demand and remote transportation options to car-and bike-sharing to autonomous vehicles, are already operational or expected to be a part of the transportation landscape in the not-too-distant future. As groundbreaking technologies and services offer new transportation possibilities, they will significantly change travel behavior and patterns, and in turn, greatly impact the infrastructure and support systems needed to keep Orange County residents mobile.

Given this reality, a 20-year transportation plan must acknowledge that change related to new technologies is inevitable. Therefore, *Designing Tomorrow* includes two “discussion scenarios” to explore a sample of many possible futures that may take shape by 2040. The first is the Innovation scenario that considers potential impacts of certain technological innovations on travel behavior, in addition to the Trend 2040 investments and assumptions. The second is the Policy scenario, which builds on the Innovation scenario to also consider how policy changes being discussed at the state and regional levels could further influence travel behavior and leverage some of the technological innovations.

When comparing the performance of the Innovation discussion scenario to Trend 2040, it appears that autonomous vehicles, telecommuting technologies, and on-demand ridehailing services may not provide a focused benefit to the transportation system. Except for average freeway speeds, all other performance measures worsen under the Innovation scenario: arterial speeds decline, transit trips drop, and there is greater delay in travel times. This is primarily due to the assumption that autonomous vehicles will be accessible to many individuals who cannot operate vehicles today, as well as the introduction of zero-occupant trips, which together increase vehicle miles traveled and congestion while reducing transit ridership. However, if policies are put in place to maximize the impact of technology on travel behavior, the performance measures show better outcomes.

Examples of policies that leverage innovations could include: allowing autonomous vehicles to access carpool lanes, like today’s clean air vehicle policy; providing telecommuting incentives to businesses; and policies that support ridesharing, including additional park-and-ride lots. Additionally, policies that are more independent from innovations can also substantially influence travel behavior. These could include mileage-based user fees, priced parking, and policies that enhance land use diversity and connectivity with active transportation facilities and transit services. The Policy scenario adds assumptions to the Innovation scenario that are intended to represent the types of policies described above. When comparing the Policy discussion scenario with Trend 2040, system performance improves significantly: there is a nearly 30 percent decrease in travel time delay, and freeway and arterial speeds increase by approximately 9 percent and 8 percent, respectively.

This highlights the important role policy will play to help guide how innovations should be implemented, as well as the level of direct impact policy can have on travel behavior. The development of these influential innovations and policies will continue to be monitored by OCTA for further discussion, as noted in the Short-Term Action Plan.

TRANSPORTATION SYSTEM PERFORMANCE SUMMARY

Metrics (daily)	Trend 2040	Innovation	Policy
Delay as a percent of travel time	15.4%	16.9%	11.7%
Transit trips	174,000	171,000	170,000
Freeways - AM peak average speed (mph)	39.7	39.8	43.1
Arterials - AM peak average speed (mph)	25.9	25.4	28.0

Future Efforts

In closing, *Designing Tomorrow* outlines several conceptual projects that go beyond the Trend 2040 financially constrained scenario that may further achieve the goals of the plan. As these conceptual projects become defined and refined through stakeholder input and environmental analyses, OCTA may consider including them in the financially constrained scenario of future LRTPs.

CONCEPTUAL PROJECT LIST

Description
Local Arterial Projects
Crown Valley Parkway – I-5 to Greenfield Drive lane additions beyond MPAH
Cabot Road – Paseo de Colinas to Camino Capistrano lane additions beyond MPAH
Harbor Boulevard/Ball Road gradeseparated intersection
Harbor Boulevard – Warner Avenue to 17th Street lane additions beyond MPAH
Laguna Canyon Road* – El Toro Road to Canyon Acres Drive
OC Intersections Assessment recommendations
MPAH Complete Streets Assessment recommendations
OC Active recommendations
Countywide Communications Study (ITS) recommendations
Highway Projects
Ortega Highway – Operational Improvements
I-5 – Avenida Pico to Avenida Vaquero truck lane
Freeway Chokepoints (TBD)
Direct access ramps (TBD) – Managed lane and high-capacity transit support
SR-55 - Improve access and merging in the vicinity of Meats Avenue
Transit Projects
Metrolink expansion (increase from 86 to 98 weekday trains)
Other Projects
OC Goods Movement Study recommendations
Projects from Partner Agencies
SR-73/Glenwood intersection improvement (Phase III) - TCA
FTC South – SR-241/Oso Parkway to I-5 (San Diego) – TCA

**Note: Contingent on voter approval of a local sales tax supporting the Laguna Canyon Road project, OCTA will include it in Orange County's financially constrained submittal for the 2020 RTP/SCS*

Designing Tomorrow also identifies several short-term activities to keep OCTA moving forward by continuing to plan and evolve by working with partner agencies, engaging Orange County communities, and integrating emerging innovations and policies.

2018 LRTP SHORT-TERM ACTION PLAN

Activity	Description
Orange County Planning Activities	
Coordination with Local Partner Agencies	Continue dialogue with local jurisdictions, Caltrans District 12, TCA, local transit operators, and other local agencies as needed to further intra-county connectivity.
South Orange County Mobility	Identify multi-modal transportation needs and opportunities in South Orange County.
Corridor Studies & Improvements	Conduct studies evaluating the feasibility of multi-modal corridor enhancements.
OC Transit Vision Feasibility Studies	Study options to improve transit service and connectivity along corridors identified through the OC Transit Vision.
Transit Support Services	Establish a long-term plan for Orange County transit supportive services, such as OC Flex, Vanpools, and Park & Rides.
Managed Lane Studies	Identify operational enhancements to the HOV network and criteria for potential expansion of priced managed lanes.
Freeway Chokepoints	Develop long-term freeway chokepoint improvement strategies, assuming OC Go is fully implemented.
Signal Synchronization	Support local initiatives to maintain and modernize signal synchronization corridors countywide.
Transportation Demand Management (TDM)	Study opportunities for new or expanded TDM projects.
Active Transportation Investments	Continue evaluating Orange County's Active Transportation needs, develop long-term plans, and implement programs that address data collection, data management, and safety education.
Sustainable Transportation Strategies	Coordination with partner agencies on implementation of sustainability strategies.
Joint Development Studies	Evaluate opportunities for joint developments at OCTA transit terminals to improve transit facilities and connectivity with employment/housing.
Asset Management	Monitor maintenance needs for existing and new facilities and equipment. Update fleet plans to address zero-emission bus requirements.
Adaptation Planning	Study infrastructure needs and develop recommendations
Traffic Model Update	Update Orange County Traffic Analysis Model to incorporate latest socioeconomic data
Regional Planning Activities	
Coordination with Regional Partner Agencies	Continue dialogue with SCAG, SANDAG, County Transportation Commissions, SCAQMD, Caltrans, and other regional agencies as needed to further inter-county connectivity.

2018 LRTP SHORT-TERM ACTION PLAN CONTINUED

Activity	Description
Regional Planning Activities	
Trade Corridors/Goods Movement	Coordinate primarily through SCAG and Metro to plan for projected growth in regional goods movement.
2020 RTP/SCS	Participate in the development of the 2020 RTP/SCS and initiate dialogue with SCAG and local jurisdictions.
2028 Olympics	Coordinate with Metro on preparations for the 2028 Olympics
Metro Countywide ExpressLanes Strategic Plan	Continue dialogue with Metro and appropriate agencies to identify impacts to, and opportunities for, connectivity with Orange County's transportation network.
San Diego's I-5 HOT Lane Project	Continue dialogue with SANDAG and appropriate agencies to identify impacts to, and opportunities for, connectivity with Orange County's transportation network.
West Santa Ana Branch/Pacific Electric Right-of-Way	Continue dialogue with Metro and appropriate agencies to identify impacts to, and opportunities for, connectivity with Orange County's transportation network.
Gold Line Eastern Extension – Phase 2	Continue dialogue with Metro and appropriate agencies to identify impacts to, and opportunities for, connectivity with Orange County's transportation network.
LOSSAN/Green Line Connection	Participate in SCAG's effort to identify impacts to, and opportunities for, connectivity. Metro is the lead agency for planning, constructing, and operating major transit capital investments in Los Angeles County such as this connection.
Emerging Issues	
Monitor New Technology	Monitor developing technologies and their potential impacts on transportation (e.g., autonomous vehicles, alternative fuels, and smart phone applications).
Connected Infrastructure Needs Assessment	Study infrastructure needs and identify opportunities to implement and/or complement emerging transportation technologies.
State and Federal Regulation	Monitor state and federal legislation/regulations.
State and Federal Funding	Identify strategies and opportunities to access and leverage State and federal funding.
Transportation Outreach and Education	
Active Transportation Safety	Seek opportunities to enhance public outreach and education related to active transportation safety.
Transit Use and Trip Planning	Explore new approaches to increase use of modes other than single occupant vehicles, including enhanced transit and active transportation facilities, public education, and incentives.

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DESIGNING TOMORROW

2018 LONG-RANGE TRANSPORTATION PLAN



ORANGE COUNTY TRANSPORTATION AUTHORITY