



**August 28, 2025**

**To:** Regional Transportation Planning Committee  
**From:** Darrell E. Johnson, Chief Executive Officer  
**Subject:** Regional Traffic Signal Synchronization Program Update

### **Overview**

The Orange County Transportation Authority has been working with cities, the County of Orange, and the California Department of Transportation to fund and implement key regional traffic signal synchronization projects. This annual report provides an update on the Measure M2 Regional Traffic Signal Synchronization Program, including results from recently completed projects, and an update to the Countywide Signal Synchronization Baseline Project.

### **Recommendation**

Receive and file as an information item.

### **Background**

The Orange County Transportation Authority (OCTA) provides funding, technical assistance, and project management services to implement multiagency signal synchronization as part of the Measure M2 (M2) Regional Traffic Signal Synchronization Program (Project P). Annually, OCTA provides competitive grants dedicated to the coordination of traffic signals across jurisdictional boundaries. The goal of Project P is to improve traffic flow by developing and implementing regional signal coordination that crosses local agencies' boundaries and maintains coordination through freeway interchanges, where possible.

Since 2008, OCTA and local agencies have implemented 109 signal synchronization projects along key corridors within Orange County. The projects have improved travel times, reduced delays and congestion, and increased the number of successive green lights drivers experience on their travels. The results of the program translate into direct benefits to motorists and the environment measured in time and cost savings from lower fuel consumption, a reduction of greenhouse gas (GHG) emissions, and air pollution. Additionally, the program includes signal infrastructure upgrades to improve signal operations and safety for all modes of travel along and crossing the project corridors.

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**Discussion**

Signal synchronization is a cost-effective way to make better use of existing roadways and reduce the need for major new construction. Project P provides funding for signal synchronization projects through annual competitive calls for projects (call), with 80 percent of funding from Project P and 20 percent from local agencies' matching funds. Supplemental funding is used whenever available, including SB 1 (Chapter 5, Statutes of 2017) Local Partnership Program funds, and Solutions for Congested Corridors Program grants. Project P builds upon prior signal synchronization work funded through M2, Proposition 1B Traffic Light Signal Synchronization Program, and air quality funds.

Projects are corridor-based and begin with a detailed field review. The existing basic parameters are evaluated with the field data to ensure these parameters meet the standards approved by the agency that operates them for safe clearance for bicycles and pedestrians, as well as vehicles through each signalized intersection. The new optimized signal timings are developed based on current traffic conditions and travel patterns and ultimately give all users a better travel experience. Key to these efforts is regular dialogue between all partner agencies along each project corridor, including the California Department of Transportation at highway and freeway crossings, to ensure the project addresses the unique operational needs of the corridor, resulting in agencies working together towards the multijurisdictional goal of the program.

Signal synchronization projects implement a coordination strategy involving synchronization of the respective agencies' signal systems, including the necessary upgrades to the traffic signal infrastructure. Eligible signal infrastructure improvements include traffic signal devices, central system upgrades, and solutions that enhance operation and increase safety for all modes of travel. This includes modifications that prepare for future connected and autonomous vehicle technologies and applications. Existing synchronization on crossing arterials is incorporated when and where possible. Optimized timings are developed and implemented for identified peak periods, which are typically weekday mornings, midday, and evenings. For weekend operations, the peak is typically mid-morning through early evening.

To quantify signal synchronization benefits, "before" and "after" travel time studies are conducted to evaluate the improvements from these new optimized timing plans. The travel time studies are conducted during peak-traffic periods with specially equipped vehicles to collect traffic data. These studies showed improvements across all performance measures, including travel time, number of stops, and average safe speed. Additionally, fuel consumption, GHG, and other vehicle emission data are also estimated. Signal synchronization efforts nationwide have historically yielded five to 15 percent improvements in travel time and speed, as well as fewer stops. Comparisons of the program corridors' before and after studies indicate results in Orange County rank in the high-end of the national range

due to the combination of the optimized traffic signal timing plans, cooperation between all participating agencies, and minor signal upgrades to maximize traffic flow.

### Signal Synchronization Projects

Project P's target is to regularly synchronize 2,000 signalized intersections, as expressed in the M2 voter pamphlet. OCTA and local agencies have completed 109 signal synchronization projects since 2008, of which 27 projects were a revisit and retiming of a previously completed corridor. A total of 3,789 signalized intersections and 979 centerline miles of streets have been implemented. The Board of Directors' (Board)-approved grant awards for the completed projects total approximately \$107.6 million. The completed projects are identified on the map in Attachment A.

The completed projects have reduced average travel time by 13 percent and the average number of stops by 28 percent, with average speed improving by 14 percent (Attachment B). Travelers in Orange County are projected to save approximately \$248.8 million (at \$3.90 per gallon in today's dollars) on fuel costs and reduce GHG emissions by approximately 1.3 billion pounds over the three-year project cycle. The reduction in GHG emissions is achieved by decreasing the number of stops, smoothing traffic flow, and minimizing vehicle acceleration and deceleration. These results are comparable to signal synchronization efforts nationwide and were achieved despite significant fluctuations in local travel patterns influenced by various factors. The following table lists two completed signal synchronization projects that have implemented new timing plans since the 2024 update to the Board, along with the corresponding travel time and speed improvements:

Corridor	Limits	Length (Miles)	Travel Time Improvements	Average Speed Improvements
Lake Forest Drive	Portola Parkway to Romano/Hidden Canyon	7.45	13 percent	15 percent
Orangethorpe Avenue	Walker Street to New River Road	17.28	13 percent	15 percent

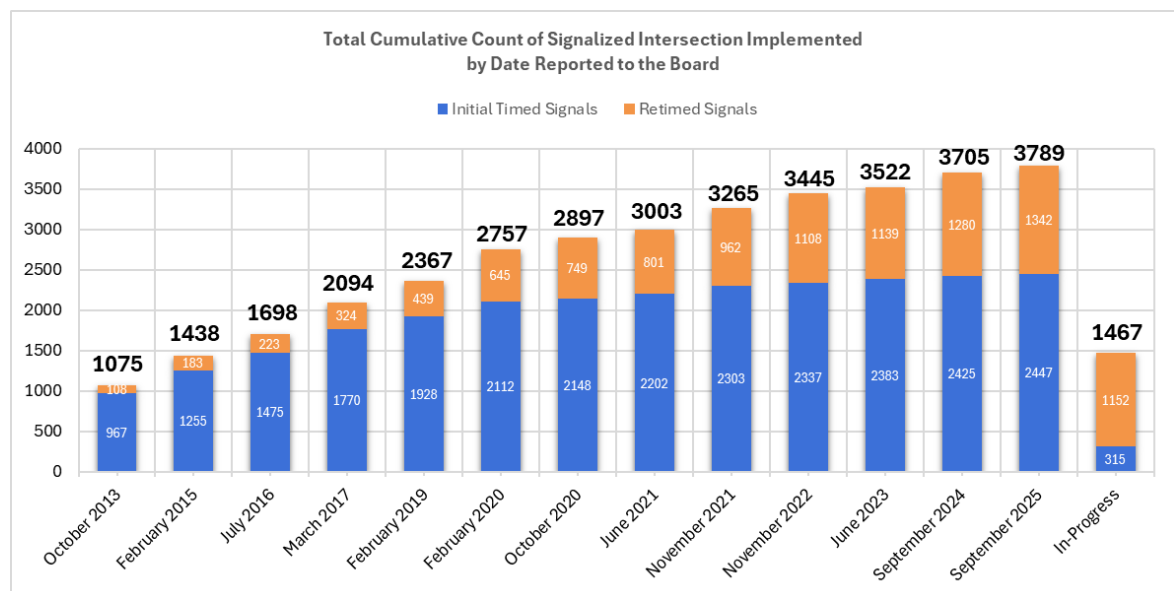
In addition to the two completed projects noted above, the following five corridor projects have implemented new optimized timing plans with final evaluation and documentation in progress for project improvement reporting in the coming months:

- 26 intersections along 8.2 miles of MacArthur Boulevard/Talbert Avenue from the Walmart Shopping Center in the City of Huntington Beach to MacArthur Place in the City of Santa Ana
- 28 intersections along 6.65 miles of Red Hill Avenue from Bristol Street in the City of Costa Mesa to Bryan Avenue in the City of Tustin

- 55 intersections along 11.4 miles of Tustin Avenue/Rose Drive from First Street in the City of Tustin to Wabash Avenue in the City of Placentia
- 60 intersections along 13.1 miles of First Street/Bolsa Avenue from Bolsa Chica Street in the City of Huntington Beach to Newport Avenue in the City of Tustin
- 66 intersections along 17 miles of Barranca Parkway/Dyer Road/ Segerstrom Avenue/Slater Avenue from Magnolia Street in the City of Fountain Valley to Bake Parkway in the City of Irvine

Currently, including the five projects above, there are 30 active projects funded by OCTA that synchronize traffic signals. These projects are in various stages of implementation and have been awarded a total of approximately \$78 million in grants, including external funds. This investment is in addition to the \$107.6 million for completed projects described earlier in this report. Once completed, these projects will synchronize an additional 1,467 signalized intersections and 283 miles of roadway. The projects which are in the implementation phase include a total of 1,152 intersections (78.5 percent) that will be a revisit of timing implemented previously as part of this program but need updating to align with current traffic patterns.

Resynchronizing traffic signals periodically is the best practice to respond to changes in traffic. This recalibration process ensures the signal infrastructure is operating efficiently. Project P allows previously completed streets and highways projects to compete again for funding during the annual call. The following chart displays the cumulative count of signalized intersections of completed projects organized by the order in which it was presented to the Board. For each reporting year, the total signalized intersections implemented are further divided to indicate the total number of those signalized intersections that were initially timed and have been retimed as part of the program.



The last column in the chart above shows the additional 1,467 signalized intersections that will be synchronized by projects that are currently underway and discussed above.

#### Countywide Signal Synchronization Baseline

On February 12, 2024, the Board approved the selection of a consultant to deliver the Countywide Signal Synchronization Baseline Project (Baseline Project). This Baseline Project will build on the investments to date and retime approximately 2,500 signalized intersections in Orange County. The Baseline Project will evaluate corridor synchronization as a network, reduce the impact to crossing coordination, and establish a new baseline for signal synchronization performance. OCTA has leveraged the Congestion Mitigation and Air Quality and Surface Transportation Block Grant Program funds to ensure that partner agencies can participate without requiring matching funds. The Baseline Project has completed the collection of signalized intersection counts and existing condition inventory. Signal synchronization simulation models are being developed to support the optimization of the coordination timing plans. Implementation of optimized timing plans are planned to begin in mid-2026 with a monitoring phase until project completion in 2029.

#### Next Steps

OCTA continues to work with local agencies through various OCTA-led groups, including the Technical Steering Committee, Technical Advisory Committee, and the traffic forum to identify corridors that are eligible for funding and that would benefit from signal program funding as part of the annual call.

#### ***Summary***

OCTA and local agencies have successfully implemented new cooperative traffic signal synchronization timing on 109 corridors. Another 30 projects are planned or underway alongside the Baseline Project. The synchronization of traffic signals along these regional corridors continually results in significant improvements to traffic flow by reducing total travel times, stops per mile, and improving average safe speeds while decreasing fuel costs, GHG, and overall vehicle emissions.

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***Attachments***

- A. Orange County Transportation Authority-Funded Signal Synchronization Projects, (2008 – Present)
- B. Summary of Results for Completed Regional Traffic Signal Synchronization Projects

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