CITY OF GLENDALE, CALIFORNIA
REPORT TO THE CITY COUNCIL

AGENDA ITEM

Report: Traffic Signal Synchronization project including optimized traffic signal timing and synchronization of 50 signalized intersections in downtown Glendale.

1. Motion authorizing staff to implement the Traffic Signal Synchronization Project

COUNCIL ACTION

Item Type: Action Item

Approved for November 15, 2022 **calendar**

EXECUTIVE SUMMARY

The Traffic Signal Synchronization project proposes to implement optimized traffic signal timing and synchronization at 50 traffic signals within the downtown area. City staff and consultants prepared a Citywide traffic model using the “Synchro” transportation engineering software platform used by most cities, counties and states to evaluate, manage, and synchronize traffic signals. Traffic signal timing and synchronization requires evaluation and updating every 10 years to accommodate for changes in land-use, development, and traffic patterns. Traffic signals in Glendale were last synchronized over 10 years ago. This proposed project will improve mobility and safety for motorists, bicyclists and pedestrians and staff requests approval of a motion authorizing staff to move forward with this project.

COUNCIL PRIORITIES

Mobility/Connectivity/Safety: Implementing optimized traffic signal timing and synchronizing 50 traffic signals within the downtown area will improve mobility by reducing unnecessary delays for the public in reaching their destinations. The improved efficiency can also reduce driver frustration, red-light running, and serious accidents. The improvements will continue to provide for pedestrian and bicycle timing per State standards.

Infrastructure: The optimized traffic signal timing and synchronization project will optimize the efficiency of the existing roadway, traffic lanes, and traffic signal infrastructure. This will better manage existing infrastructure, reduce traffic congestion and delay without the need to construct additional infrastructure.

Environmental Stewardship: Reducing traffic congestion and unnecessary delays has been shown to improve air quality and reduce production of greenhouse gases.

RECOMMENDATION

That the City Council approve a Motion authorizing staff to proceed with the Traffic Signal Synchronization project that will implement optimized traffic signal timing and synchronization of 50 signalized intersections in downtown Glendale.

BACKGROUND

In the City of Glendale, there are 243 signalized intersections of which approximately 177 are monitored by the existing Traffic Management System.

The City was previously awarded 2013 Metro Call for Projects grant funding for implementation of the Regional Arterial Traffic Performance Measure System (RATPeMS) project, including Proposition C Discretionary funds and Measure R funds. The City Council approved execution of a funding agreement with Metro, on November 14, 2017, for implementation of the project and approved construction of fiber optic communications infrastructure improvements on June 29, 2021. The project installed additional fiber optic communications infrastructure on Broadway from Chevy Chase Drive to Glendale Avenue, fiber video detection system improvements at 54 locations, integration of up to 65 signalized locations on arterial streets into the proposed arterial performance system corridors, and preparation of a Synchro traffic model for use as a traffic signal system performance measurement tool. A consultant contract was also awarded for preparation of a Synchro traffic model and implementation of optimized traffic signal synchronization timing at up to 50 locations within downtown Glendale.

Traffic signal management and synchronization are engineering techniques of managing traffic signal operation at successive intersections along street corridors to maximize efficiency of vehicle travel, reducing unnecessary delay, improve safety and providing safe, controlled crossings for pedestrians and bicycles. Synchronization results in reduced stopping and delay at the intersections which helps reduce

unnecessary vehicle idling, pollution, and travel times, thereby resulting in reduced greenhouse gas emissions. Traffic signal synchronization works by calculating the arrival time for a group (i.e., platoon) of vehicles at each intersection that are traveling at the designated posted speed limit. The traffic signals are designed to turn green when the group of vehicles arrive at each intersection, however, if motorists are traveling above the posted speed limit, they would arrive early at the next intersection and encounter a red light.

Per the Federal Highway Administration (FHWA) reference, traffic signal management can be defined as using improved tools, techniques, and equipment to make existing traffic signal control systems operate more efficiently. The benefits can include:

- Improved air quality and reduced fuel consumption;
- Reduction in congestion and time savings for commercial and emergency vehicles, buses, and the public;
- Reduction in the number of serious accidents;
- Reduction of aggressive driving behavior, including red-light running; and
- Postpone or eliminate the need to construct additional road capacity.

Further FHWA reference states that two-thirds of all miles driven each year are on roadways controlled by traffic signals. In California alone, motorists drive more than 60 billion miles (97 billion kilometers) each year on signal-controlled streets. And, according to FHWA estimates, as many as 75 percent of all traffic signals could easily be improved by updating equipment or by simply adjusting their timing plans and/or coordinating adjacent signals.

Many signalized intersections in downtown Glendale are located on major and minor arterial street corridors. There is a need to review and re-synchronize traffic signals every 10 years based on changes in surrounding land-use, land development, changes in traffic patterns, traffic volume, road geometry, and traffic lanes. Traffic signals along arterial streets can be synchronized to reduce unnecessary vehicle idling, reduce pollution, improve air quality, and reduce unnecessary delays.

Implementing the optimized and synchronized signal timing for up to 50 signalized intersections along five corridors in the downtown area, including, Central Avenue, Brand Boulevard, Glendale Avenue, Broadway, and Colorado Street will apply recommended traffic signal management techniques and improve the efficiency of the signal timing and synchronization along these critical downtown corridors.

The total cost of the Traffic Signal Synchronization project is $134,836. This amount includes the preparation of the Synchro traffic model for 157 intersections and timing charts which have already been completed. The remaining work on this project includes the installation of the timing in the traffic controllers and fine tuning which costs $7,863.28

The Traffic Signal Synchronization Project was presented to the Transportation & Parking Commission (TPC) on October 24, 2022. The TPC approved a motion recommending the City Council approve the Traffic Signal Synchronization Project and

requested staff to return to the Commission after implementation of the project to report on the safety related outcomes.

ANALYSIS

The synchronization process is a platoon-based system that uses common traffic signal cycle lengths along street corridors and offsets the sequencing between the intersections to synchronize the traffic flow. This traffic model-based process uses the speed limit model for platoon movements called “Bandwidth” between upstream and downstream sites. This is uniquely important in moving vehicles in closely spaced intersections with high demand traffic flows where vehicles have limited opportunities for lane changes between intersections. In addition, the bicycle minimum green and pedestrian walk intervals are reviewed and modified based on the City’s traffic signal timing guidelines.

The RATPeMS project prepared a Syncho traffic model for 157 intersections within the City’s regionally significant arterials, including San Fernando Road, Glenoaks Boulevard, Glendale Avenue, Central Avenue, Brand Boulevard, Colorado Street, and Broadway. Peak-hour traffic volume data was gathered and input into the Synchro software traffic model. The existing traffic signal timing identified areas that could benefit from improved traffic signal timing and the model was optimized to identify the improved traffic signal timing, sequencing, and synchronization parameters.

The optimized parameters from the model are then converted to the traffic signal timing data that are then input into the traffic signal field controllers. These new parameters are reflected on the “timing sheets” that are ready for deployment at 50 signalized locations within the downtown area, including, Central Avenue, Brand Boulevard, Glendale Avenue, Broadway, and Colorado Street.

Synchronization is a low cost and very effective way to improve safety and air quality on City streets.

The project limits are entirely within downtown Glendale as shown in Exhibit 1 – Project Location Map.

STAKEHOLDERS/OUTREACH

Outreach on this project occurred through a dedicated website for the completed RATPeMS project. The website page introduced the public to the project and to the project team, explained the scope of work and project locations, highlighted the project phases, and provided the public with Staff contact information for questions, discussion and/or input.

FISCAL IMPACT

The total cost to implement the Traffic Signal Signalization project is $7,863.28, which was approved as a part of the FY 2022-23 budget. No new appropriation is being requested at this time. The City Council approved funding is outlined below:

Existing Appropriation		
Amount	**Account String**	**Funding Source**
$5,500.28	GL: 52100-4090-PWD-0020-P0000 PL: G52161	Capital Improvement Reimbursement Fund
$2,363.00	GL: 52100-4020-PWD-0020-P0000 PL: 52083	State Gas Tax Fund

ENVIRONMENTAL REVIEW

The Project is categorically exempt from environmental review because of CEQA Guidelines §§ 15301.

ALTERNATIVES

Alternative 1: Approve a motion authorizing staff to implement the Traffic Signal Synchronization Project including optimized traffic signal timing and synchronization at 50 signalized intersections in downtown Glendale.

Alternative 2: Do not authorize to implement the Traffic Signal Synchronization Project. The subject intersections will not be synchronized and continue to operate as they are now.

Alternative 3: The City Council may consider any other alternative not proposed by staff.

ADMINISTRATIVE ACTION

Prepared by:
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Approved by:
Roubik R. Golanian, P.E., City Manager

EXHIBITS

Exhibit 1: Project Location Map