

Project Name	East Los Angeles Advanced Transportation Management Project
Eligible Entity Applying to Receive Federal Funding	County of Los Angeles
Total Project Cost (from all sources)	\$8,274,966
ATCMTD Request	\$4,137,483
Are matching funds restricted to a specific project component? If so, which one?	Yes, the Traffic Management Center Operation match (see Attachment C)
State(s) in which the project is located	California
Is the project currently programmed in the: <ul style="list-style-type: none"> • Transportation Improvement Program (TIP) • Statewide Transportation Improvement Program (STIP) • MPO Long Range Transportation Plan • State Long Range Transportation Plan 	Yes/No – please specify in which plans the project is currently programmed Yes, TIP (Metro’s 2013 Call For Projects Mode 3 - Signal Synchronization and Bus Speed Improvements)
Technologies Proposed to Be Deployed (briefly list)	Fiber and wireless communication, Dedicated Short Range Communication (DSRC) roadside equipment in support of a Signal Phase and Timing (SPaT) deployment, advanced traffic controllers, various traffic signal improvements, automated pedestrian detection

PROJECT NARRATIVE

Project Description

1. *Introduction*

The County of Los Angeles (County) Department of Public Works (Public Works) is proposing an extensive congestion management technology deployment project in the unincorporated area of East Los Angeles. The East Los Angeles Advanced Transportation Management Project (Project) has several key components that will support the County's current and future vision for its intelligent transportation system (ITS) deployment in the area. This Project incorporates all of the goals for the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) initiative and supports many of the Department of Transportation's (DOT) identified focus areas. These components will also contribute to community revitalization through improvements made at busy regional commercial centers and the optimization of the overall multimodal transportation system in the area, which benefits both motorized and non-motorized users alike.

A core Project component is a Signal Phase and Timing (SPaT) broadcast deployment on four critical arterials in the East Los Angeles area. The deployment includes the replacement of existing traffic signal controllers and firmware with advanced traffic signal controllers (ATCs) and upgraded D4 firmware with SPaT capabilities as well as the installation of Dedicated Short Range Communication (DSRC) roadside equipment on Atlantic Boulevard, Cesar E. Chavez Avenue, Whittier Boulevard, and 3rd Street. The proposed improvements will also support enhanced transit operations for the Gold Line on 3rd Street and the Metro Rapid Bus Line 720 (Line 720) on Whittier Boulevard. Segments of Line 720 have some of the highest ridership totals for the entire Metro bus system. The Project will also provide for the integration of these new ATCs and firmware with the County's existing advanced traffic management system (ATMS), and the County's transit signal priority (TSP) standard. These improvements will also enhance the use of existing transportation capacity and overall transit user experience with reduced travel time and increased travel time reliability.

Another key portion of the Project is a significant communications gap closure for the East Los Angeles area, where communication currently only exists along the Los Angeles County Metropolitan Transit Authority (Metro) Gold Line Eastside light rail (Gold Line) on 3rd Street. In conjunction with the Metro's 2013 Transportation Improvement Program Call for Projects and 2016 Net Toll Revenue Reinvestment grant programs, this Project will provide fiber and multi-spectrum wireless communication for 112 of 139 County-maintained traffic signals in the East Los Angeles area. Fiber optic communication will be installed along strategic routes to provide communication backhaul to the County's traffic management center (TMC). Multi-spectrum wireless communication will be installed where fiber is cost-prohibitive or impractical. These improvements are necessary to enable communications back to the TMC and to allow the County to improve its monitoring capabilities of its existing and future transportation assets and help ensure a state of good repair. In addition, the installation of communications with upgraded controller firmware and timing and Bluetooth/Wi-Fi readers on selected transit routes will be consistent with ATCMTD goals by providing the capability to collect real time data, measure and improve operational performance of the transportation network, and reduce greenhouse gas emissions through reducing congestion and streamlining traffic flow while utilizing existing transportation capacity.

PROJECT NARRATIVE

As part of the Project, existing firmware and signal timing will be updated on multiple roadways throughout the East Los Angeles area to connect the traffic signal controllers to the County's TMC. By connecting the signals, traffic data will be collected and analyzed by the County to measure and improve the operational performance of the transportation network. In support of this effort, operational improvements and traffic signal synchronization projects on Eastern Avenue and 1st Street will upgrade existing infrastructure and equipment to current standards and install detection capability to fully implement traffic actuated operation at locations that are currently operating as pre-timed. The County has been a regional leader in deploying these types of improvements across nearly 3,000 traffic signals involving 70 cities countywide. This Project component will help alleviate congestion and decrease travel times, which delivers environmental benefits such as reduced transportation-related greenhouse gas emissions. Additionally, by reducing the number of red lights, it is anticipated that this Project component will assist in the reduction of rear-end type crashes.

Pedestrian safety measures are also proposed on several routes with identified heavy pedestrian volumes or regional activity centers, which will provide a better connection to essential services. This includes the intersections adjacent to Gold Line stations on 3rd Street, intersections near the final Line 720 stop and a shopping center on Whittier Boulevard, and intersections near a commercial area on 1st Street. The pedestrian safety measures include a deployment of automated pedestrian detection and the integration and deployment of a mobile accessible pedestrian signal system (PED-SIG) application with its supporting infrastructure. These efforts should help reduce traffic-related pedestrian fatalities and injuries in the area. The lessons learned from these deployments can be shared and assist in the reproducibility of successful systems and services to other locations and jurisdictions facing similar challenges countywide. Additionally, the development work to incorporate the PED-SIG application into the D4 firmware will provide the framework for a wider deployment of PED-SIG by other jurisdictions that also use the D4 firmware.

PROJECT NARRATIVE

2. *A description of the entity that will be entering into the agreement with FHWA including.*

a) Membership of any partnership or entity proposed to carry out the deployment;

The County will carry out the deployment of the proposed Project and is not a member of any formal partnership related to the proposed Project. However, the County is a member of the Coalition for Transportation Technology, which includes two ATCMTD grant recipients (City of Los Angeles Department of Transportation and Los Angeles County Metropolitan Transportation Authority) and will actively consult and be able to build upon lessons learned from these earlier ATCMTD deployments.

Since 1988, the County has been the leader in a multijurisdictional coordination effort involving major arterials. Initially, the County's role was to construct and implement Traffic Signal Synchronization Program (TSSP) projects. These projects upgrade traffic signals along arterial routes of regional significance to current traffic standards, and implement coordination timing for improved traffic flow efficiency. This synchronization effort continues to this day. As of May 2017, nearly 3,000 traffic signals have been synchronized and another 340 traffic signals will be synchronized with current projects.

With the emergence of ITS and the enhanced functionality and benefits that can be achieved by its deployment, it was a natural progression for this substantial TSSP effort to be expanded to include ITS elements. As a result of substantial funding being committed by Metro in 1995, the Regional Traffic Signal Forum (Forum) Program was established. Today, the County is administering three major Forum projects, each comprised of approximately 20 cities. The purpose of the program is to ensure the coordination timing established by the TSSP remains in place, and that each agency is able to maintain its independence and autonomy while participating in a multijurisdictional approach to regional coordination of major arterials.

The County's Forum has proven successful in creating an institutional infrastructure to coordinate the activities of the agencies responsible for traffic signal operations in Los Angeles County. These Forums have enabled funding to be targeted at infrastructure improvements along arterial and arterial/freeway corridors in the County sub-regions. These projects are a critical part of what is rapidly becoming a network of integrated ITS systems in Los Angeles County. As part of these Forum projects, the County has deployed its ATMS traffic control system along with its regional data collection and sharing Information Exchange Network (IEN) system, installed 34 miles of fiber optic communication as well as wireless radios to nearly 1,100 locations, and deployed numerous other ITS devices including CCTVs, magnetometers, and Bluetooth readers throughout Los Angeles County.

b) A description of how the entity will manage the program including management of project funding.

The County is the primary agency responsible for the design, construction, operation, and maintenance of roads, traffic signals, bridges and airports in unincorporated Los Angeles County. Additionally, as a first responder agency, the County also maintains a 24-hour Dispatch Center and an on-call Department Emergency Operations Center.

PROJECT NARRATIVE

Public Works' Traffic and Lighting Division (T&L) is charged with monitoring roadway safety, design and implementation of traffic controls and devices, and monitoring and control of traffic signals countywide through the County's TMC. The County maintains approximately 2,000 traffic signals, with around 800 of those traffic signals currently connected to the County's TMC. There are approximately 5,000 traffic signals connected to the County's IEN, which provides real-time monitoring of traffic signals in other participating jurisdictions and enhanced signal timing based on nearby traffic signals. Additionally, T&L will manage the grant program from the application stage through construction and final approval. T&L has successfully applied for and administered numerous local, state, and federal grants that have helped build up the County's traditional transportation and ITS network. Project managers are assigned to each grant to carefully monitor, organize, and coordinate the various components of each grant project.

3. *A description of the geographic area or jurisdiction the deployment will service.*

The East Los Angeles area of Los Angeles County is located approximately five miles east of downtown Los Angeles and covers an area of approximately 7.5 square miles. East Los Angeles is a self-contained unincorporated area that is bordered by the City of Los Angeles to the west, the City of Monterey Park to the north, the City of Montebello to the east, and City of Commerce to the south. The community is bisected by the Pomona (CA-60) and Long Beach (I-710) Freeways. The Santa Ana (I-5) Freeway is located within one-half mile to the south. It includes the unincorporated communities of Belvedere Gardens, City Terrace, and Eastmont (see Attachment E, Project Map).

The demographic profile of East Los Angeles is comprised of a relatively young, ethnic, and densely populated community. The 2010 U.S. Census reports a community population of 145,900, which represents a 1.8 percent growth from 2000 to 2010. The population density of the community is estimated at 17,000 persons per square mile, which is more than double the population density of the adjacent cities of Monterey Park and Montebello.

The community is predominately Hispanic (97.1 percent) with 44.5 percent of residents being foreign-born. As a whole, Los Angeles County is 48.1 percent Hispanic with 35.6 percent of the residents being foreign-born. Nearly 90 percent of households speak a language other than English at home, while the County average is 56.4 percent. The population in East Los Angeles is generally younger than the County-wide population. The median age is 29 years, whereas the County median age is 34. Thirty-one percent of the population is under 18 years old, while 24 percent of the County's population is under the age of 18.

Generally, household income is significantly lower in East Los Angeles than the County average. The estimated median household income is \$39,103, while the County median is \$55,870. In East Los Angeles, 27 percent live below the poverty level, while the County average is 18.7 percent. The home-ownership rate in East Los Angeles is 34.8 percent while the County rate is 48.2 percent. Household size is also larger in the community when compared to the County. Average household size is 4.1 persons per household, considerably higher than the County average of 3.04 persons per household.

PROJECT NARRATIVE

Due to all of these factors, residents of this community rely heavily on public transportation. Metro provides multiple bus routes as well as the Metro Light Rail service via the Gold Line to the unincorporated East Los Angeles area. The Gold Line has seven stations that serve the community along this line. In addition, the County provides transit service via the El Sol Shuttle.

4. *A description of the real world issues and challenges to be addressed by the proposed technology deployments. Applicants should discuss how the proposed technology deployments address the goals of the initiative, and any applicable technology focus area.*

Los Angeles County is one of the largest counties in the nation with approximately 4,084 square miles of land area and more than 65 percent of the County (2,650 square miles) is unincorporated. Public Works' headquarters and TMC is located in Alhambra, which is centralized, but still requires about an hour of travel to reach the County's limits. Due to the dispersed nature of the County's jurisdiction, it has been a challenge to provide communication to its various traffic signals. To address this issue, the County developed an award-winning wireless communication solution that uses a combination of fiber optic lines, leased lines, and point to multipoint wireless radios. The communications gap closure component of the proposed Project will provide fiber and wireless communication for 112 of 139 County-maintained traffic signals in the East Los Angeles area. The communication deployment provides the basis for the rest of the proposed technology deployment.

As part of a lower-income, densely-populated community, East Los Angeles experiences heavy transit use and its roadways have high pedestrian and bicyclist volumes, particularly around its regional activity centers. Whittier Boulevard serves Line 720, which has the highest ridership (38,600 weekday ridership) in the entire Metro bus system. It is a vital link in the regional transit network connecting the San Gabriel Valley with major job and activity centers in Downtown, Mid-City, and West Los Angeles/Santa Monica. East-west arterials such as Whittier Boulevard experience significant congestion during the morning and afternoon peak periods. The Project will improve the experience for both transit users and motorists alike with improved travel times and increased throughput. By increasing the travel time reliability, commuters will be able to diversify mode choice and departure times, which will even further decrease congestion. Commuters will also be able to travel to more distant employment hubs in less time, increasing the economic opportunities for a traditionally underserved community.

Another modal option for commuters to access the major and activity centers in Downtown Los Angeles is 3rd Street, which runs parallel to the Gold Line. The existing traffic signal equipment on 3rd Street has limited the efficiency of the light rail operation. By installing upgraded ATC and D4 firmware, which has enhanced transit priority capabilities, 3rd Street will be able to reduce the number of stops made by the Gold Line, thereby reducing travel time and increasing travel time reliability. Pedestrian safety measures will be installed near the Gold Line stations in order to create a more pedestrian-friendly environment.

The improvements to the multimodal transportation system will help provide safe, reliable, and affordable connections to employment centers (Downtown), education (East Los Angeles College), healthcare (East Los Angeles Doctors Hospital), and other essential services

PROJECT NARRATIVE

(Department of Social Services). Improved transit service will increase ridership and enhance the attractiveness of the area for more commercial and housing development, which in turn revitalizes the community.

The proposed Project supports the following goals for the advanced transportation and congestion management technologies deployment initiative:

Reduced costs and improved return on investments, including through the enhanced use of existing transportation capacity

The traffic signal synchronization projects on Eastern Avenue and 1st Street will alleviate congestion and decrease travel time while using existing transportation capacity, which demonstrates an improved return on existing infrastructure investments. Wireless multi-spectrum communication capable of accommodating two frequencies will allow the County to consolidate its communications needs into a single wireless solution by featuring two separate frequencies that support, Metro's current TSP standard technology and the County's existing wireless communication network. By reducing the number of necessary communication devices, the cost for installation and maintenance will be decreased. Additionally, the communication gap closure will connect traffic signals to the ATMS at the County's TMC, which will allow staff to remotely implement traffic signal timing, which improves efficiency and reduces staffing costs. The County's ATMS will also alert staff of critical failures such as conflict flash and provide remote diagnostics of detector and communication health, which reduces potential liability concerns.

Delivery of environmental benefits that alleviate congestion and streamline traffic flow

According to the American Lung Association's State of the Air 2016 report, Los Angeles ranked 1st for high ozone days out of 228 reported metropolitan areas, 4th for annual particle pollution out of 171 reported metropolitan areas, and 9th for 24-hour particle pollution out of 184 reported metropolitan areas. Pollution and transportation-related emissions remain a real issue for the residents of Los Angeles County. Operational improvements and traffic signal synchronization projects on Eastern Avenue and 1st Street will upgrade existing infrastructure and equipment to current standards and install detection to fully implement traffic actuated operation at traffic signals currently operating as pre-timed. The replacement of outdated infrastructure will contribute to the community's revitalization and demonstrate the County's investment in the community. This Project component will help alleviate congestion and decrease travel times, which enhances the use of existing transportation capacity and delivers environmental benefits such as an annual reduction of 225 tons of transportation-related greenhouse gas emissions and other air pollutants as a result of reduced idle times. The Project will build upon the County's current TSSP and ITS deployments that have an **annual** fuel saving of 41 million gallons. Additionally, these projects have helped reduce travel times in the region by 29 percent, prevented the generation of 10,750 tons of greenhouse gas emissions each year, and saved drivers 34 million travel hours.

PROJECT NARRATIVE

Measurement and improvement of the operational performance of the applicable transportation networks

The proposed Project includes upgrading existing firmware and signal timing on multiple roadways throughout the East Los Angeles area to connect the traffic signal controllers to the County's TMC. By connecting the signals, traffic data can be collected on a once-per-second basis and analyzed by the County to measure and improve the operational performance of the transportation network. In particular, the County's KITS ATMS features the Historical Interval Timing (HIT) report, which is a diagnostic tool that logs phase changes and controller status data and is used to fine-tune and troubleshoot traffic signal timing. The Bluetooth/Wi-Fi reader deployment will allow staff to measure and improve performance on two critical transit routes. TMC staff will actively monitor the connected traffic signals during workday morning and afternoon peak hours.

Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety

The proposed Project will reduce the number of red lights through signal synchronization, resulting in the reduction of rear-end type crashes and providing an increase in driver, passenger, and pedestrian safety. Also, the signal synchronization projects will include infrastructure improvements to bring the intersections to current design standards such as Americans With Disabilities Act (ADA) compliant pedestrian access ramps. Other improvements such as larger signal lenses and relocated vehicle heads will enhance traffic signal control visibility, which should further reduce rear-end type crashes. The pedestrian safety measures such as the automated pedestrian detection should decrease the potential for pedestrian and vehicle conflicts, and reduce the number of pedestrian crashes. Additionally, the Project will complete safety improvements on Whittier Boulevard at Eastern Avenue to remedy the high traffic incidents at this location.

Collection, dissemination, and use of real time transportation related information to improve mobility, reduce congestion, and provide for more efficient and accessible transportation, including access to safe, reliable, and affordable connections to employment, education, healthcare, freight facilities, and other services.

The proposed SPaT deployment will directly support the collection, dissemination, and use of real-time transportation-related information. DSRC-equipped vehicles will be able to receive and use locally broadcasted signal phase and timing data on the Project's critical arterials. The ATCs will be capable of collecting high-resolution data that can be leveraged in conjunction with other County projects such as the proposed integration of high-resolution data analysis into the County's ATMS. The analyses will allow TMC operators to more effectively create timing plans to improve mobility, reduce congestion, and provide for more reliable and efficient multi-modal transportation to employment, education, healthcare, and other services. Bluetooth/Wi-Fi readers installed on two bus corridors will collect travel times and assist TMC operators in assessing the effectiveness of timing plans. The improvement of transit travel times and reliability will directly enhance access to affordable connection options.

PROJECT NARRATIVE

Delivery of economic benefits by reducing delays, improving system performance and throughput, and providing for the efficient and reliable movement of people, goods, and services

As a transit-reliant lower income community, East Los Angeles has seen rapid growth in recent years, compounding concerns of congested roadways and insufficient public transportation supply. The construction and operation of the Metro Gold Line has added complication to traffic signal timing and transit operations for Metro's bus lines. Due to the dense nature of the roadways through the East Los Angeles area, long queues at signals are more frequent during peak hour travel. The installation of the ATCs and upgraded D4 firmware along 3rd Street and Whittier Boulevard will support enhanced transit operations for the Gold Line as well as Line 720, which has some of the highest ridership for the entirety of Metro's bus system. These improvements will also enhance the use of existing transportation capacity and overall transit user experience with reduced travel time and increased travel time reliability, which in turn provides economic benefits by reducing delays, improving system performance and throughput, and providing for the efficient and reliable movement of people, goods, and services in an effort to increase connectivity to employment, education services, and other opportunities.

Monitoring transportation assets to improve infrastructure management, reduce maintenance costs, prioritize investment decisions, and ensure a state of good repair

The proposed Project will enable communications back to the TMC and allow the County to improve its monitoring capabilities of its existing and future transportation assets and help ensure a state of good repair. Staff will be able to monitor traffic signals and troubleshoot issues without requiring field work. The County's ATMS will provide engineering staff with immediate notification of signal malfunctions or indicate where communications devices are in need of repair, thereby allowing for expedited maintenance responses. The Bluetooth/Wi-Fi deployment allows staff to monitor arterial performance on two critical transit routes, which will help prioritize investment decisions in improving performance on those two routes as well as the overall transportation network in the East Los Angeles area.

Accelerated deployment of vehicle-to-vehicle, vehicle-to-infrastructure, and automated vehicle applications, and autonomous vehicles and other advanced technologies

As part of this technology deployment, the SPaT deployment with the installation of fiber and wireless communications and DSRC roadside equipment will provide for current and future TSP and Connected Vehicle (CV) applications, including future Vehicle-to-Infrastructure (V2I) advanced safety systems. The County will gain experience in the deployment and maintenance of the DSRC roadside equipment, which can accelerate deployment of other V2I and CV applications in the East Los Angeles area, as well as expansion of these technologies to other areas of Los Angeles County.

Demonstration, quantification, and evaluation of the impact of these advanced technologies, strategies, and applications towards improved safety, efficiency, and sustainable movement of people and goods

These investments will enhance mobility, sustainability, and livability for citizens and businesses in East Los Angeles. Since East Los Angeles is a transit-reliant community, the signal synchronization and transit priority components of the Project will provide an

PROJECT NARRATIVE

improved user experience with reduced travel times and increased travel time reliability. These improvements can be quantified through improvements in travel time, travel time reliability, and increased ridership. The Project will build upon the County's current TSSP and ITS deployments that have an annual fuel saving of 41 million gallons, prevented the generation of 10,750 tons of greenhouse gas emissions each year, and saved drivers 34 million travel hours.

Reproducibility of successful systems and services for technology and knowledge transfer to other locations facing similar challenges

The lessons learned from these deployments can be shared and assist in the reproducibility of successful systems and services to other locations and jurisdictions facing similar challenges. The SPaT deployments on Atlantic Boulevard, Cesar E. Chavez Avenue, Whittier Boulevard and 3rd Street will be the first completed in the County of Los Angeles. The D4 deployment on Atlantic Boulevard and Whittier Boulevard will support Metro's Countywide Signal Priority (CSP). Other jurisdictions and future County deployments will benefit from the knowledge acquired during the initial deployment. The automated pedestrian detection and the PED-SIG application component of the Project will also be the first completed in the County. These types of projects can be replicated in the future throughout the County.

The proposed Project supports the following DOT priority areas:

Transportation elements associated with Smart Cities

The proposed Project includes the installation of communication throughout the East Los Angeles area. Fiber will be installed on strategic routes to provide communication backhaul to the County's TMC. Wireless communication will be installed where fiber is cost-prohibitive and/or impractical. The communication deployment will connect the field devices to the central ATMS at the County's TMC in an interactive network that can support a future wider Smart City environment.

Systemic applied pedestrian crossing technology

The proposed Project includes pedestrian safety measures on several routes with identified heavy pedestrian volumes or regional activity centers. This includes the intersections adjacent to Gold Line stations on 3rd Street, intersections near the final Line 720 stop and the shopping center on Whittier Boulevard, and intersections near the commercial center on 1st Street. The pedestrian safety measures include a deployment of automated pedestrian detection and the integration and deployment of a mobile accessible pedestrian signal system (PED-SIG) application with its supporting infrastructure. As part of the pedestrian crossing technology deployment at logical identified locations, the mobile access pedestrian signal system application and automated pedestrian detection will reduce the potential of traffic-related pedestrian injuries and fatalities, as well as assist in the optimization of the traffic signal timing. The lessons learned from the deployment of the pedestrian safety measures will assist the County in future deployment of pedestrian crossing technology.

PROJECT NARRATIVE

Traffic signal data acquisition, analysis, and management

The proposed Project includes upgrading existing firmware and signal timing on multiple roadways throughout the East Los Angeles area to connect the traffic signal controllers to the County's TMC. Once connected to the TMC, traffic signal data can be collected in the database and analyzed using integrated tools such as the HIT report in the County's ATMS. Additionally, the upgraded D4 firmware will be integrated into the County's ATMS, which further allows for traffic signal data acquisition, analysis, and management. Bluetooth/Wi-Fi readers will feed travel time data back to the TMC, allowing staff to analyze the performance of selected arterials.

5) *A description of transportation systems and services to be included in project.*

SPaT Deployment

The Project will deploy advanced traffic signal controllers with upgraded D4 firmware with SPaT broadcast capabilities and signal timing on Atlantic Boulevard, Cesar E. Chavez Avenue, Whittier Boulevard, and 3rd Street. The new upgraded firmware will also require some development work in order to be compatible with the County's existing TSP standard. DSRC roadside equipment will be installed in order to allow the broadcast of SPaT messages. These improvements will enhance the use of existing transportation capacity and overall transit user experience with reduced travel time and increased travel time reliability. It will also provide signal phase and timing messages for DSRC-capable vehicles and install the necessary infrastructure for additional CV applications.

Communication Gap Closure

The communication portion of the Project is divided into traditional fiber optic communication and multi-spectrum wireless communication. Fiber will be installed on several arterials (Eastern Avenue, Atlantic Boulevard, Cesar Chavez Avenue, Ramona Boulevard, and Olympic Boulevard) to provide communication backhaul to the County's TMC. Multi-spectrum wireless communication will be installed throughout the project area and feature two separate frequencies, Metro's current transit signal priority (TSP) standard technology, and the County's existing wireless communication network. The wireless communication solution will consolidate the equipment needs for the communications systems, thereby reducing deployment complexity, maintenance, and cost. The communication deployment provides the basis for the rest of the proposed technology deployment.

Signal Synchronization, Timing, and TMC Operations

The Project will install new and upgrade existing traffic signal infrastructure and equipment such as signal standards and mast-arms, controller cabinets, and detection on Eastern Avenue and 1st Street in support of the County's TSSP. New detection will be installed on 1st Street to accommodate fully traffic-actuated operation to replace the existing pre-timed operation. Additionally, traffic signal locations with communications installed will have updated controller firmware and signal timing. The upgrades, along with the installed communication, will connect the project traffic signals to the County's TMC and allow the County to improve its monitoring capabilities of its existing and future transportation assets and help ensure a state of good repair, such as alerting the County when an intersection is in conflict or a detector is stuck on or off. The updated firmware will enable traffic signal timing to be uploaded and

PROJECT NARRATIVE

downloaded remotely from the County's TMC without extensive field study or cost. As TMC operational costs are considered eligible for Federal Aid, the connection of new traffic signals to the County's TMC will require some additional effort to incorporate each intersection into the ATMS (i.e. creating intersection graphics, entering timing into the database, etc.). As part of the Project, a pro-rata share of the total TMC operation cost was calculated for the 112 additional traffic signals to be connected to the County's TMC as follows:

Yearly TMC Operation Costs: ~\$500,000

Connected Traffic Signals - ~800 intersections

Cost per intersection = $\$500,000 / 800 = \625 per intersection

New connected intersections = 112 intersections

Pro-rata share of TMC Operation Costs = $\$625 \times 112 = \$70,000$

Upgraded Traffic Signal Controller and Firmware Integration with ATMS

The Project will deploy advanced traffic signal controllers with upgraded D4 firmware and signal timing on Whittier Boulevard and 3rd Street to enhance transit operations that are not currently supported by the existing traffic signal controllers and firmware. The County's existing traffic control software, Kimley-Horn Integrated Transportation System (KITS), will need to be modified to accommodate the new firmware and controllers. These modifications have already been deployed for other jurisdictions that use KITS and it is anticipated that the initial integration with the County's system would require minimal additional development work. Additional customizations will be made to ATMS interface in order to accommodate modifications to the D4 firmware in support of the other parts of the Project. The new upgraded firmware will also require some development work in order to remain compatible with the County's existing TSP standard. These improvements will enhance the use of existing transportation capacity and overall transit user experience with reduced travel time and increased travel time reliability.

Pedestrian Safety Measures Deployment

There are two pedestrian safety measure components to the proposed Project. The installation of automated pedestrian detection will be implemented on Whittier Boulevard, 1st Street, and 3rd Street at locations with significant pedestrian activity or near regional activity centers such as Gold Line light rail stations. The automated pedestrian detection will allow for extended pedestrian clearance times and be compatible with existing and proposed traffic signal controller equipment. These efforts should help reduce traffic-related pedestrian fatalities and injuries in the area.

The second component consists of the integration and deployment of a mobile accessible pedestrian signal system (PED-SIG) application with its supporting infrastructure on Whittier Boulevard and 3rd Street at locations with significant pedestrian activity or near regional activity centers such as Gold Line light rail stations. PED-SIG will augment the existing pedestrian push buttons at the subject locations and will likely help reduce the number of crashes related to pedestrian right-of-way violations. The PED-SIG application will also enhance accessibility for disabled pedestrians as a pedestrian push button actuation would no longer be necessary.

PROJECT NARRATIVE

Performance Measurement Deployment

The Project will also deploy Bluetooth/Wi-Fi readers on two transit routes in order to collect arterial travel times as part of the County's effort to monitor traffic on major arterials for performance. In conjunction with the Communications Gap Closure component of the Project, travel time data will be sent to the County's TMC and used to develop new and modify existing timing plans.

- 6) *A plan to deploy and provide for the long-term operation and maintenance of advanced transportation and congestion management technologies to improve safety, efficiency, system performance, and return on investment.*

The County is committed to continuing its lead role as the administrator of the ITS component of the Regional Traffic Signal Forum program and has committed to maintaining the County's KITS ATMS, the County's regional traffic data collection and sharing (IEN) system, wireless communications system, and the associated field devices. To demonstrate this level of support, the County has expended over \$500,000 per year for the last four fiscal years to operate and maintain the County's TMC and field devices necessary to ensure the region's arterials remain coordinated and operating as efficiently as possible. The County currently has an annual traffic operations labor budget of \$4.1 million and a staff of over 30 people. Our annual traffic signal maintenance budget is \$11.7 million, which supports a staff of approximately 50. This amount does not include additional funds that are committed to IEN and ATMS expansion related activities.

Most of the core Project components include improvements that are typical for traffic signal maintenance and will be incorporated into the County's yearly budget process. It is not believed that current or future support of the devices to be installed will require any staffing or budget changes. The County will be performing the traffic signal maintenance at the Project locations.

The installation of the fiber optic communications and deployment of the pedestrian improvements and Bluetooth/Wi-Fi devices will require additional maintenance resources, however, the County does not anticipate that these additional maintenance costs will be significant compared to the overall County's traffic signal maintenance budget. Since the integration of the ATMS at the Project locations involves an expansion of the currently deployed ATMS, no significant operational changes are anticipated. The County remains committed to implementing and maintaining innovative improvements to improve safety for all modes in its jurisdiction and will absorb the minimal additional maintenance costs.

- 7) *A description of any challenges in the regulatory, legislative, or institutional environments or other obstacles to deployment.*

The County's governing body, Board of Supervisors, has supported the County's efforts to advance regional transportation connectivity and mobility, optimize traffic signal synchronization, enable congestion management and relief, improve safety, decrease

PROJECT NARRATIVE

commute times, and reduce greenhouse gas emissions. There is no anticipated legislative obstacle to deployment.

All of the selected Project locations are under the County's jurisdiction or at traffic signals that are maintained by the County. This minimizes obstacles to the deployment during the approval process, such as right-of-way issues. Environmental challenges are not expected as these projects are typically categorically exempt.

The County will work closely with Metro regarding any regulatory issues that may arise, as some of the Project components impact the operations of the Gold Line light rail. The County has experience with these types of concerns and has worked with Metro staff since the deployment of the Gold Line Eastside Extension and does not anticipate any significant delays. The County awards construction contracts through a competitive bid process, which may introduce some delay, but will be accommodated in the Project schedule.

The pedestrian safety measures component may present some challenges in deployment as the technology is relatively new and needs to be adapted to the County's purposes. Automated pedestrian detection has not been heavily used in the United States and the County will need to evaluate how to best implement the detection systems at the Project locations. Due to these challenges, the County has elected to limit its current deployment to evaluate the existing available technology and determine best practices in its uses. The lessons learned can be used in future countywide deployments of both the automated pedestrian detection and the PED-SIG application.

- 8) *Quantifiable system performance improvements, such as –*
- a) Reducing traffic-related crashes, congestion, and costs*
 - b) Optimizing system efficiency; and*
 - c) Improving access to transportation services.*

The following system performance improvements are expected:

- Reduced travel time for Metro Rapid Line 720 on Whittier Boulevard
 - County will work with Metro to measure the pre- and post-project travel times for Metro 720 on Whittier Boulevard
- Improved on-time performance for Metro Rapid Line 720 on Whittier Boulevard
 - County will work with Metro to measure pre- and post-project on-time performance for Metro 720 on Whittier Boulevard
- Improved on-time performance for Gold Line Eastside Extension light rail on 3rd Street
 - County will work with Metro to measure pre- and post-project on-time performance for the Gold Line Eastside Extension on 3rd Street
- Improved travel time reliability for arterial and transit travel on Whittier Boulevard and 3rd Street
 - County will analyze pre- and post-project travel time reliability on Whittier Boulevard and 3rd Street
- Improved arterial travel time on various Project routes
 - County will conduct before and after travel time studies
- Increased system throughput on various Project routes

PROJECT NARRATIVE

- County will conduct before and after traffic counts
 - Fewer transit-related crashes on Whittier Boulevard and 3rd Street
 - County will analyze available pre- and post-project transit-related traffic collision data
 - Fewer pedestrian and bicyclist-related crashes on Whittier Boulevard, 1st Street, and 3rd Street
 - County will analyze available pre- and post-project pedestrian and bicycle-related traffic collision data
- 9) *Quantifiable safety, mobility, and environmental benefit projections such as data-driven estimates of how the project will improve the region's transportation system efficiency and reduce traffic congestion.*

Since 1988, the County has been the key leader in a multijurisdictional coordination effort involving major arterial roadways. As of May 2016, more than 150 projects have been constructed that have synchronized more than 2,800 intersections. The Project will build upon the County's current TSSP and ITS deployments that have an **annual** fuel saving of 41 million gallons. Additionally, these projects have helped reduce travel times in the region by 29 percent, prevented the generation of 10,750 tons of greenhouse gas emissions each year, and saved drivers 34 million travel hours.

Once implemented, the Project is projected to have an **annual** benefit of 858,000 gallons of fuel saved, 708,000 vehicle hours saved, and the prevention of 225 tons of greenhouse gas emissions. According to the United States Environmental Protection Agency's (EPA) Environmental Justice Screen index, the East Los Angeles area ranks in the 94th percentile or higher for hazardous air quality indicators in the nation. This ranking includes air quality concerns related to particulate matter, ozone, and traffic proximity and volume.

Additionally, the project will reduce collisions along the project corridors. Currently, the East Los Angeles area has collision rates that are higher than the expected rate for the area. Between January 1, 2011 and December 31, 2015, the Project corridors had 2,370 intersection-related collisions. The proposed Project is expected to reduce intersection-related collisions significantly through the implementation of the various Project components. See Attachment D, Benefit Analysis.

- 10) *Vision, goals, and objectives of the applicant for the technology deployment, including any future related deployments; the vision of the organization and goals, objectives, and activities to be pursued in addressing the identified issues and challenges.*

The County's goals for the technology deployment include:

- Utilizing state-of-the-art traffic management technologies to advance regional transportation connectivity and mobility
- Optimizing traffic signal synchronization
- Enabling congestion management and relief
- Improving safety
- Decreasing commute times

PROJECT NARRATIVE

- Reducing greenhouse gas emissions.
- Building public/private partnerships to integrate regional ITS data with people, vehicles, infrastructure, and passengers' personal communication devices.

The County's vision is to have nearly every traffic signal located in the unincorporated County and a majority of the greater Los Angeles region's major intersections connected to the County's TMC. Consistent with the goals of its governing body, the County has focused its current ITS efforts on traditionally disadvantaged, low-income, underserved population areas, including East Los Angeles.

In support of this vision, the proposed technology deployments will help eliminate the existing communications gap while providing infrastructure improvements to enhance the operation and safety for all modes on County roadways in the East Los Angeles area. This current deployment will connect nearly all of the County-maintained traffic signals in the East Los Angeles area to the County's TMC.

As East Los Angeles has areas with significant pedestrian activity, the County is also interested in expanding its deployment of pedestrian safety measures through a pedestrian detection project as well as the implementation of the PED-SIG application on roadways identified with heavy pedestrian volumes or regional activity centers such as Gold Line light rail stations. These deployments will assist the County in determining future intersection treatments to increase pedestrian safety.

11) A plan for partnering with the private sector or public agencies, including multimodal and multijurisdictional entities, research institutions, organizations representing transportation and technology leaders, or other transportation stakeholders.

Since 1988, the County has been the leader in a multijurisdictional coordination effort involving major arterials. With the emergence of ITS and the enhanced functionality and benefits that can be achieved by its deployment, the Regional Traffic Signal Forum (Forum) Program was established. Today, the County is administering three major Forum projects, each comprising approximately 20 cities. The purpose of the program is to ensure the coordination timing established by the TSSP remains in place, and that each agency is able to maintain its independence and autonomy while participating in a multijurisdictional approach to regional coordination of major arterials.

The County has maintained a long-standing working relationship with Metro, which provides multimodal transportation options in the East Los Angeles area. The County has actively worked with Metro since the initial deployment of the Countywide Signal Priority and continues to do so. Project components have been specifically selected to be compatible and/or improve the existing infrastructure that will impact Metro's operations and assets. Metro will be consulted for the design and implementation of proposed improvements that may impact Metro's operations and assets. Some Project components will be designed by private sector consultants that are under contract with the County. Additionally, the construction phase of these Project components typically go out for competitive bid to private sector companies.

PROJECT NARRATIVE

The non-profit Intelligent Transportation Society of California (ITSCA) will provide expert advice and support the County in the deployment of the DSRC roadside equipment and other ITS devices. The ITSCA Board members include many nationally-known CV experts, members of the National V2I coalition, and the Connected Vehicle Pooled Fund Study. ITSCA will assist the County in public outreach, awareness, and promotion of the technology and systems both regionally and nationally. The V2I Coalition is a joint effort between the Association of American State Highway Officials (AASHTO), ITS America, and the Institute of Transportation Engineers (ITE). The coalition is focused on guidance, outreach, initiatives, research, and partnership activities across the United States that can further the goals of V2I technology to reduce traffic-related fatalities and injuries, reduce traffic congestion, improve traveler mobility, and reduce impacts of transportation modes on the environment.

The County is also a member of the Coalition for Transportation Technologies, which was formed to provide peer-to-peer collaboration for the regular exchange of information, coordinated funding pursuits, and overall advancement of emerging technologies in the region. This Coalition will facilitate the ATCMTD goal of increasing reproducibility of successful systems and services for technology and encouraging knowledge transfer to other locations facing similar challenges.

The County is also a key stakeholder in the Interstate 210 (I-210) Pilot Connected Corridor project, which is the first integrated corridor management project run by the California Department of Transportation and Partners for Advanced Transportation Technology (PATH) at the University of California, Berkeley. Some of the core Project components will enhance the County's efforts to support this pilot connected corridor project. Enhancements such as the integration of the upgraded D4 firmware into the County's ATMS can be further leveraged in future projects, including later phases of the I-210 Pilot project.

The County will also work with PATH in the modification of the PED-SIG mobile accessible pedestrian signal system to integrate with the D4 firmware, which will support future deployment of PED-SIG as numerous other agencies use the D4 firmware nationwide. Since the use of automated pedestrian detection is not currently prevalent in the United States, the County will be consulting with industry leaders and vendors of this technology to pick the appropriate devices for installation at Project locations.

12) A plan to leverage and optimize existing local and regional advanced transportation technology investments.

The Project will leverage the County's existing local and regional advanced transportation technology investments by installing the necessary infrastructure to connect its traffic signals in the East Los Angeles region to its existing ATMS at the County's TMC. The County's ATMS, KITS, has been operating at the County's TMC for nearly a decade with approximately 800 intersections currently connected. The Project will allow for expanded

PROJECT NARRATIVE

coverage in KITS by integrating more advanced firmware into the ATMS and upgrading existing traffic signal infrastructure to allow communication with the ATMS.

Existing traffic signal cabinets and controllers will be maintained, except for the upgraded ATCs at locations related to the Gold Line and Line 720 and the replacement of outdated cabinets at locations related to the operational improvements and traffic signal synchronization along Eastern Ave and 1st Street. The upgraded ATCs are compatible with the County's existing 332 traffic signal cabinets, which will reduce installation costs. Also, the communications component (multi-spectrum wireless communication and fiber) remains consistent with the existing and future County communication standards for traffic signals and TSP as well as proposed and future CV applications. With over 1,100 signals, the County's wireless communication network is one of the largest in the nation. The expanded wireless deployment will be able to leverage the County's knowledge and expertise developed during the existing deployment, which should result in more efficient and cost-effective design and implementation.

Additionally, the Project will leverage another current County project to incorporate its KITS system into the County's IEN by expanding the KITS system's coverage into East Los Angeles. The IEN is a coordinated network for integrating multiple agencies' traffic control systems into a regional framework that is housed at the data center at the County's TMC. This system allows for the real-time exchange of arterial traffic data and information between different agencies and jurisdictions. The IEN has over 5,000 intersections connected under multijurisdictional control, and is being proposed as a key component of integrated corridor management (ICM) projects such as the I-210 Pilot Connected Corridor. East Los Angeles can also be a future site for ICM as the City of Los Angeles to the west is already connected to the IEN and the City of Monterey Park to the east is planned to be connected to the IEN in the future.

13) A schedule for conducting the technology deployment and for completion of all proposed activities.

See Attachment B, Project Schedule.

14) Any support or leveraging of the ITS program or innovative technology initiatives (DOT ITS initiatives are described on-line at <http://www.its.dot.gov>)

A core Project component is a SPaT deployment on several critical arterials in the East Los Angeles area. The installation of DSRC roadside equipment and ATCs with compatible firmware provide the necessary infrastructure to support future CV applications and research consistent with Department of Transportation's V2I key activity as mentioned on the DOT ITS website. Development work in expanding the number of PED-SIG compatible firmware is also in direct support of the V2I key activity. The communication gap closure will also support the Data Capture and Management (DCM) program by providing the infrastructure to enable systematic data capture from connected vehicles, mobile devices, and infrastructure.

PROJECT NARRATIVE

By connecting the traffic signals in the East Los Angeles area to the County's TMC through KITS and the IEN, the County could potentially participate in future integrated corridor management projects with surrounding cities also consistent with the existing Integrated Corridor Management Systems DOT ITS program. The I-210 Pilot Connected Corridor project is already planning to use the IEN to provide the arterial component of the ICM.

PROJECT NARRATIVE

B. Staffing Description

1. A description of the organization of staffing to manage and conduct the project, including identification of key personnel, organization, role, and responsibility.

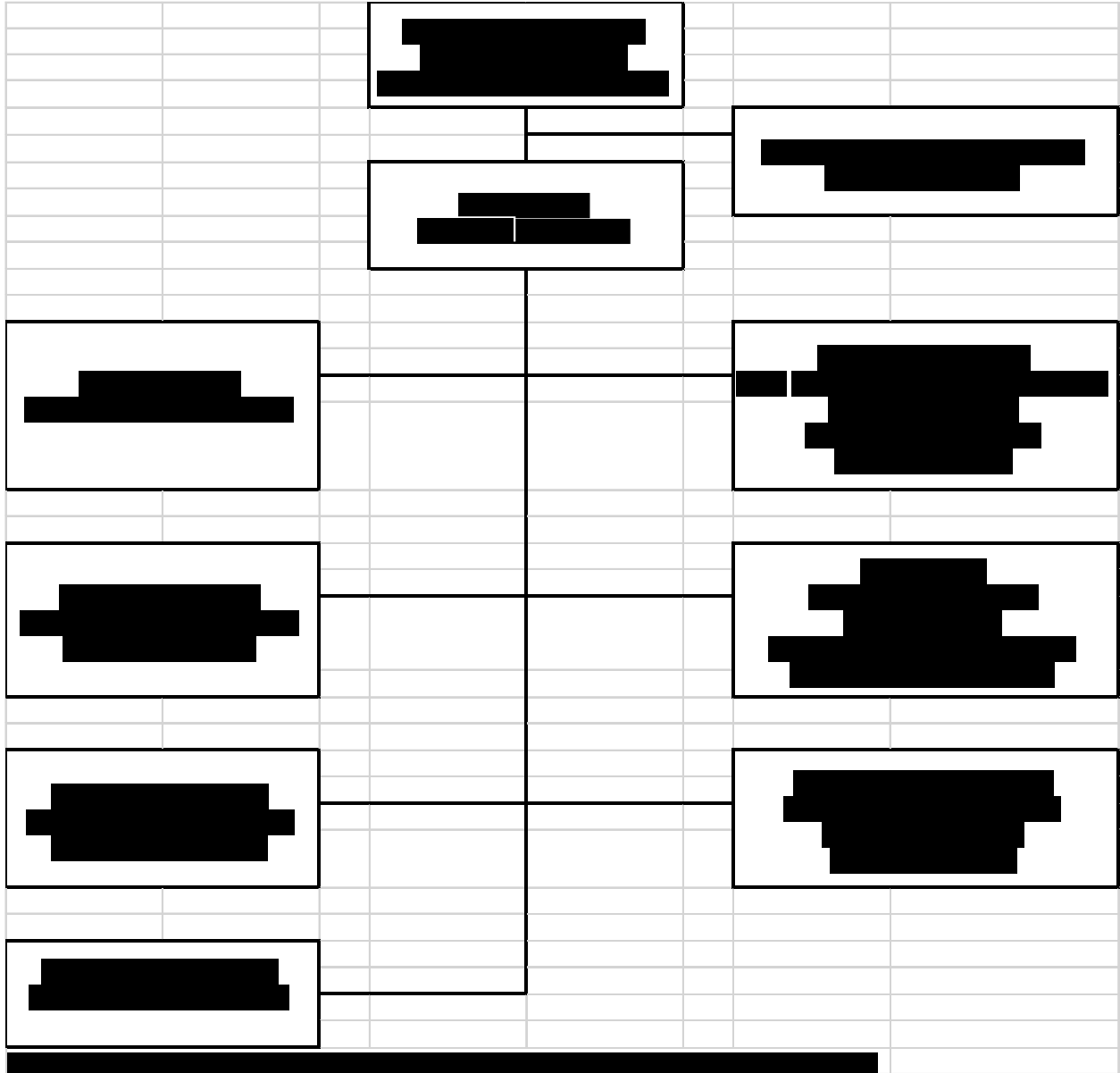
Public Works' Traffic and Lighting Division (T&L) will provide staff for engineering, project management, and operations of the Project's technology deployment. With the County's substantial experience in transportation-related projects, cities within Los Angeles County have often looked to the County for expertise in traffic signal timing, installation of traffic signal infrastructure and communication, and other projects. The County has provided varying levels of service to cities, up to full traffic signal maintenance and monitoring, under maintenance agreements and service requests.

T&L's Traffic Systems Section has dedicated staff with extensive knowledge and expertise on the design and implementation of traffic signal and ITS-related projects. Traffic Systems Section has been recognized countywide for its expertise in traffic signal design and operations and has been called upon to consult or complete work for dozens of local agencies. These staff members will develop the new signal timing and provide testing to ensure the nominal operation of the project traffic signals. Any design work such as traffic signal plans will be completed under the supervision of licensed engineers. The Traffic Systems Section is also trained to operate the County's TMC, which allows for real-time monitoring and control of the traffic signals connected to the County's ATMS. T&L's TRAFFIC section is comprised of project managers with years of experience in the timely completion of traffic signal and ITS-related projects. Each Project component will be extensively tracked for schedule and cost. These project managers are exclusively assigned to transportation-related projects and have dealt with the regulatory and approval process for similar past projects, which should minimize obstacles to this technology deployment.

Public Works' Operational Services Division (OSD) will provide staff for the maintenance of the technology deployment. OSD employs traffic signal electricians and maintenance technicians who have extensive knowledge and experience on the installation and maintenance of traffic signals, fiber and wireless communication, and other ITS-related devices. OSD is currently tasked with maintaining over 2,000 traffic signals that use multiple types of controllers and firmware as well as the supporting infrastructure, installing new devices, and maintaining existing devices on the County's wireless communication network, which is one of the largest in the nation. OSD staff has been recognized as leading experts in the deployment and maintenance of wireless radios for communication in Los Angeles County. OSD also rigorously tests new traffic signal equipment and ITS devices to determine whether these products will function properly in real-world applications. OSD works closely with the T&L Systems Section in the implementation of new and revised timing throughout Los Angeles County.

PROJECT NARRATIVE

[REDACTED]



[REDACTED]

PROJECT NARRATIVE

2) *A primary point of contact and provide complete contact information for this individual.*

Ron Matsuoka
County of Los Angeles Department of Public Works
Traffic and Lighting Division
Associate Civil Engineer
Phone: (626) 300-2036
Fax: (626) 979-5319
Email: rmatsuoka@dpw.lacounty.gov

Attachment A - Project Locations

Whittier Boulevard – Indiana Street to Saybrook Avenue

1. Whittier Bl at Indiana St
2. Whittier Bl at Alma Av
3. Whittier Bl at Ditman Av
4. Whittier Bl at Eastman Av
5. Whittier Bl at Herbert Av
6. Whittier Bl at Downey Rd
7. Whittier Bl at Eastern Av
8. Whittier Bl at Ford Av
9. Whittier Bl at McBride Av
10. Whittier Bl at Arizona Av
11. Whittier Bl at Kern Av
12. Whittier Bl at Fetterly Av
13. Whittier Bl at Ferris Av
14. Whittier Bl at Clela Av
15. Whittier Bl at Woods Av
16. Whittier Bl at Atlantic Bl
17. Whittier Bl at Margaret Av
18. Whittier Bl at Belden Av
19. Whittier Bl at Hoefner Av
20. Whittier Bl at Gerhart Av
21. Whittier Bl at Leonard Av
22. Whittier Bl at Hendricks Av
23. Whittier Bl at Findlay Av
24. Whittier Bl at Saybrook Av

Olympic Boulevard – Indiana Street to Concourse Avenue

1. Olympic Bl at Indiana St
2. Olympic Bl at Ditman Av
3. Olympic Bl at Rowan Av
4. Olympic Bl at Gage Av
5. Olympic Bl at Herbert Av
6. Olympic Bl at Downey Rd
7. Olympic Bl at Telegraph Rd
8. Olympic Bl at Eastern Av (See Eastern Av)
9. Olympic Bl at I-710 NB On-Ramp
10. Olympic Bl at Ford Av / I-710 NB Off-Ramp
11. Olympic Bl at McBride Av

12. Olympic Bl at Arizona Av
13. Olympic Bl at Fetterly Av
14. Olympic Bl at Ferris Av
15. Olympic Bl at Fraser Av
16. Olympic Bl at Vancouver Av
17. Olympic Bl at Atlantic Bl
18. Olympic Bl at Goodrich Av
19. Olympic Bl at Southside Dr
20. Olympic Bl at Hendricks Av
21. Olympic Bl at Saybrook Av
22. Olympic Bl at Garfield Av
23. Olympic Bl at Concourse Av

1st Street – Hicks Avenue to Eastern Avenue

1. 1st St at Hicks Av
2. 1st St at Ditman Av
3. 1st St at Townsend Av
4. 1st St at Rowan Av
5. 1st St at Eastman Av
6. 1st St at Gage Av
7. 1st Av at Villa Serena Dwy
8. 1st Av at Sunol Dr
9. 1st Av at Eastern Av (See Eastern Av)

3rd Street / Pomona Boulevard – Indiana Street to Hillview Avenue

1. 3rd St at Indiana St
2. 3rd St at Rowan Av
3. 3rd St at Gage Av
4. 3rd St at Record Av
5. 3rd St at Downey Rd
6. 3rd St at Eastern Av
7. 3rd St at Ford Bl
8. 3rd St at McDonnell Av
9. 3rd St at Arizona Av
10. 3rd St at Mednik Av
11. 3rd St at Civic Center Wy
12. 3rd St at La Verne Av
13. 3rd St at Beverly Bl / Woods Av
14. 3rd St/Pomona Bl at Atlantic Bl
15. Pomona Bl at Hillview Av

Cesar Chavez Ave – Lorena Street to Mednik Avenue

1. Cesar Chavez Av at Lorena St
2. Cesar Chavez Av at Rowan Av
3. Cesar Chavez Av at Gage Av
4. Cesar Chavez Av at Record Av
5. Cesar Chavez Av at Hazard Av
6. Cesar Chavez Av at Marianna Av
7. Cesar Chavez Av at Eastern Av (See Eastern Av)
8. Cesar Chavez Av at Humphreys Av
9. Cesar Chavez Av at Ford Bl
10. Cesar Chavez Av at McDonnell Av
11. Cesar Chavez Av at Dangler Av
12. Cesar Chavez Av at Mednik Av (See Mednik Av)

Atlantic Boulevard – 3rd Street / Pomona Boulevard to Telegraph Road

1. Atlantic Bl at 3rd St / Pomona Bl (See 3rd St)
2. Atlantic Bl at Beverly Bl
3. Atlantic Bl at 4th St
4. Atlantic Bl at Eagle St
5. Atlantic Bl at 6th St
6. Atlantic Bl at Hubbard St
7. Atlantic Bl at Whittier Bl
8. Atlantic Bl at Verona St
9. Atlantic Bl at Olympic Bl (See Olympic Bl)
10. Atlantic Bl at Union Pacific Av
11. Atlantic Bl at Telegraph Rd

Floral Drive – Eastern Avenue to Mednik Avenue / Monterey Pass Road

1. Floral Dr at Eastern Av (See Eastern Av)
2. Floral Dr at Humphreys Av
3. Floral Dr at Ford Bl / I-710 NB On-Ramp
4. Floral Dr at McDonnell Av
5. Floral Dr at Mednik Av / Monterey Pass Rd (See Mednik Av)

Beverly Boulevard – Atlantic Boulevard to Sadler Avenue

1. Beverly Bl at Atlantic Bl (See Atlantic Bl)
2. Beverly Bl at Hillview Av
3. Beverly Bl at Belden Av
4. Beverly Bl at Sadler Av

Ramona Boulevard – Eastern Avenue to Campus Road

1. Ramona Bl at Eastern Av (See Eastern Av)
2. Ramona Bl at Campus Rd

Eastern Avenue – Medford Street to Olympic Boulevard

1. Eastern Av at Medford St
2. Eastern Av at Paseo Rancho Castilla
3. Eastern Av at I-10 WB Ramps
4. Eastern Av at Ramona Bl
5. Eastern Av at City Terrace Dr
6. Eastern Av at Sheriff Rd
7. Eastern Av at Floral Dr
8. Eastern Av at Hammel St
9. Eastern Av at Cesar Chavez Av
10. Eastern Av at Michigan Av
11. Eastern Av at 1st St
12. Eastern Av at 3rd St (See 3rd St)
13. Eastern Av at Whittier Bl (See Whittier Bl)
14. Eastern Av at Verona St
15. Eastern Av at Olympic Bl

Mednik Avenue / Arizona Avenue – Floral Drive to Whittier Boulevard

1. Mednik Av at Floral Dr
2. Mednik Av at Hammel St
3. Mednik Av at Cesar Chavez Av
4. Mednik Av at 1st St
5. Mednik Av at Civic Center Wy
6. Mednik Av at 3rd St (See 3rd St)
7. Mednik Av at 4th St
8. Arizona Av at 6th St
9. Arizona Av at Hubbard St
10. Arizona Av at Whittier Bl (See Whittier Bl)

Attachment B - Project Schedule

SPaT Deployment	Estimated Start Date	Estimated End Date	Notes
Feasibility Study	12/2017	1/2018	
Environmental	4/2018	4/2019	
Design – Plans, Specifications and Estimates (PS&E)	4/2018	4/2019	Multi-phase
Construction	5/2019	9/2021	Multi-phase

Communication Gap Closure	Estimated Start Date	Estimated End Date	Notes
Feasibility Study	12/2017	1/2018	
Environmental	4/2018	4/2019	
Design – Plans, Specifications and Estimates (PS&E)	4/2018	4/2019	Multi-phase
Construction	5/2019	9/2021	Multi-phase

Signal Synchronization and Timing	Estimated Start Date	Estimated End Date	
Feasibility Study	N/A	N/A	
Environmental	4/2018	4/2020	
Design – Plans, Specifications and Estimates (PS&E)	4/2018	3/2020	Multi-phase
Construction	5/2019	9/2021	Multi-phase

Upgraded Traffic Signal Controller and Firmware Integration	Estimated Start Date	Estimated End Date	
Feasibility Study	N/A	N/A	
Environmental	4/2018	4/2019	
Design – Plans, Specifications and Estimates (PS&E)	12/2017	1/2020	Multi-phase
Construction	5/2019	9/2021	Multi-phase

Pedestrian Safety Measures / Bluetooth/Wi-Fi Reader Deployment	Estimated Start Date	Estimated End Date	
Feasibility Study	1/2019	10/2019	
Environmental	4/2019	7/2019	
Design – Plans, Specifications and Estimates (PS&E)	4/2019	1/2020	Multi-phase
Construction	1/2020	9/2021	Multi-phase

Attachment C - Scope of Work and Funding Source

Component	Description	Quantity	Unit Price	Amount	Sub-total	Funding Source
1: SPaT Deployment 2: Communication Gap Closure 3: Signal Synchronization, Timing, and TMC Operations 4: Upgraded controller & firmware integration with ATMS 5: Pedestrian Safety Measures Deployment 6: Performance Measurement						
System-wide Costs ATMS Development						
3,4	KITS-D4 Integration	1	75,000	75,000		Match
1,3,4	D4 Support for CSP	1	35,000	35,000		Match
1,3,4	Post Installation Support	1	50,000	50,000		Match
1,3,4	KITS-D4 Interface Enhancements	1	100,000	100,000		ATCMTD
2,3	Increased Traffic Management Center Operations	4	70,000	280,000		50% ATCMTD; 50% Match
						540,000
PED-Sig Implementation						
5	PED-SIG branding/conversion	1	25,000	25,000		ATCMTD
5	PED-SIG marketing/outreach	1	25,000	25,000		ATCMTD
5	PED-SIG system integration	1	75,000	75,000		ATCMTD
						125,000
Fiber Installation						
1,2,3	Eastern Av, Atlantic Bl, Cesar Chavez Av, Ramona Bl	1	1,692,900	1,692,900		Match
						1,692,900
1st St - Hick Av to Eastern Av						
2,3	LACO4E Timing / chip	8	3,500	28,000		ATCMTD
2,3	Multi-spectrum Communication	9	8,000	72,000		ATCMTD
2,3	Installation of Multi-spectrum communication	9	1,500	13,500		ATCMTD
3,5	TSSP Improvements (Including Pedestrian Detection)	1	758,228	758,228		ATCMTD
						871,728
3rd St - Indiana St to Pomona Bl at Hillview Av						
3,4,5	2070 controller / D4 (SPaT)	15	3,800	57,000		ATCMTD
3,4,5	Installation of D4/ATCs; timing plan conversion	15	3,500	52,500		ATCMTD
1,3,4	Proxim Wireless Radios	2	8,000	16,000		ATCMTD
1,3,4	Installation of Wireless Radios	2	1,500	3,000		ATCMTD
5	SPaT Configuration	15	2,000	30,000		ATCMTD
4	PED-SIG Configuration	6	1,000	6,000		ATCMTD
4,5	DSRC Roadside Equipment	15	10,000	150,000		ATCMTD
4	Pedestrian Detection	6	50,000	300,000		ATCMTD
						614,500
Atlantic Bl Pomona Bl to Telegraph Rd						
1,2,3,4	Signal Timing for Fiber locations (Beverly Bl to Telegraph Rd)	1	38,500	38,500		Match
1,3,4	2070 controller / D4 (SPaT)	9	3,800	34,200		ATCMTD
1,3,4	Installation of D4/ATCs; timing plan conversion	9	3,500	31,500		ATCMTD
1,3,4	TSP configuration and test	10	1,500	15,000		ATCMTD
1,3,4	DSRC Roadside Equipment	9	10,000	90,000		ATCMTD
1	SPaT Configuration	9	2,000	18,000		ATCMTD
6	Bluetooth/Wi-Fi Readers	4	5,000	20,000		ATCMTD
						247,200
Beverly Bl						
2,3	LACO4E Timing / chip	4	3,500	14,000		ATCMTD
2,3	Proxim Wireless Radios	4	8,000	32,000		ATCMTD
2,3	Installation of Wireless Radios	4	1,500	6,000		ATCMTD
						52,000
Cesar Chavez Av from Lorena St to Eastern Av						
1,2,3,4	Signal Timing for Fiber Locations (Lorena St to Eastern Av)	1	24,500	24,500		Match
1,3,4	2070 controller / D4 (SPaT)	12	3,800	45,600		ATCMTD
1,3,4	Installation of D4/ATCs; timing plan conversion	4	3,500	14,000		ATCMTD
1	SPaT Configuration	12	2,000	24,000		ATCMTD
1	DSRC Roadside Equipment	12	10,000	120,000		ATCMTD
2,3	Proxim Wireless Radios	6	8,000	48,000		ATCMTD
2,3	Installation of Wireless Radios	6	1,500	9,000		ATCMTD
						285,100
Eastern Av from Medford St to Olympic Bl						
3,5	Traffic Signal Synchronization Improvements	1	1,673,583	1,673,583		Match
						1,673,583
Floral Av						
2,3	LACO4E Timing / chip	3	3,500	10,500		ATCMTD
2,3	Proxim Wireless Radios	3	8,000	24,000		ATCMTD
2,3	Installation of Wireless Radios	3	1,500	4,500		ATCMTD
						39,000
Mednik/Arizona						
2,3	LACO4E Timing / chip	9	3,500	31,500		ATCMTD
2,3	Proxim Wireless Radios	11	8,000	88,000		ATCMTD
2,3	Installation of Wireless Radios	11	1,500	16,500		ATCMTD
						136,000
Olympic Bl						
2,3	LACO4E Timing / chip	23	3,500	80,500		ATCMTD
2,3	Fiber - Eastern Ave to Atlantic Bl	1	551,232	551,232		ATCMTD
2,3	Proxim Wireless Radios	14	8,000	112,000		ATCMTD
2,3	Installation of Wireless Radios	14	1,500	21,000		ATCMTD
						764,732
Whittier Bl						
1,3,4	2070 controller with D4	23	3,500	80,500		Match
1,3,4	Installation of D4/ATCs; timing plan conversion	23	3,500	80,500		Match
1,2,3,4	Proxim Wireless Radios	23	8,000	184,000		Match
1,2,3,4	Installation of Wireless Radios	23	1,500	34,500		Match
1	TSP configuration and test	19	1,500	28,500		Match
5	PED-SIG Configuration	5	1,000	5,000		ATCMTD
5	Pedestrian Detection	5	50,000	250,000		ATCMTD
1	D4 license upgrade to support SPaT	23	300	6,900		ATCMTD
1	DSRC Roadside Equipment	24	10,000	240,000		ATCMTD
1	SPaT Configuration	24	2,000	48,000		ATCMTD
1,2,3,4	New intersection on Whittier Bl (2070/D4 (SPat)/Radio/TSP)	1	18,300	18,300		ATCMTD
6	Bluetooth/Wi-Fi Readers	12	5,000	60,000		ATCMTD
						1,036,200
				Match	4,137,483	
				ATCMTD	3,940,460	
				ATCMTD PM (5%)	197,023	
				ATCMTD Total	4,137,483	
				Grand Total	8,274,966	

2017 ATCMTD
East Los Angeles

Attachment D

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
BENEFITS ANALYSIS REPORT
PREDICTED ANNUAL SAVINGS PER YEAR

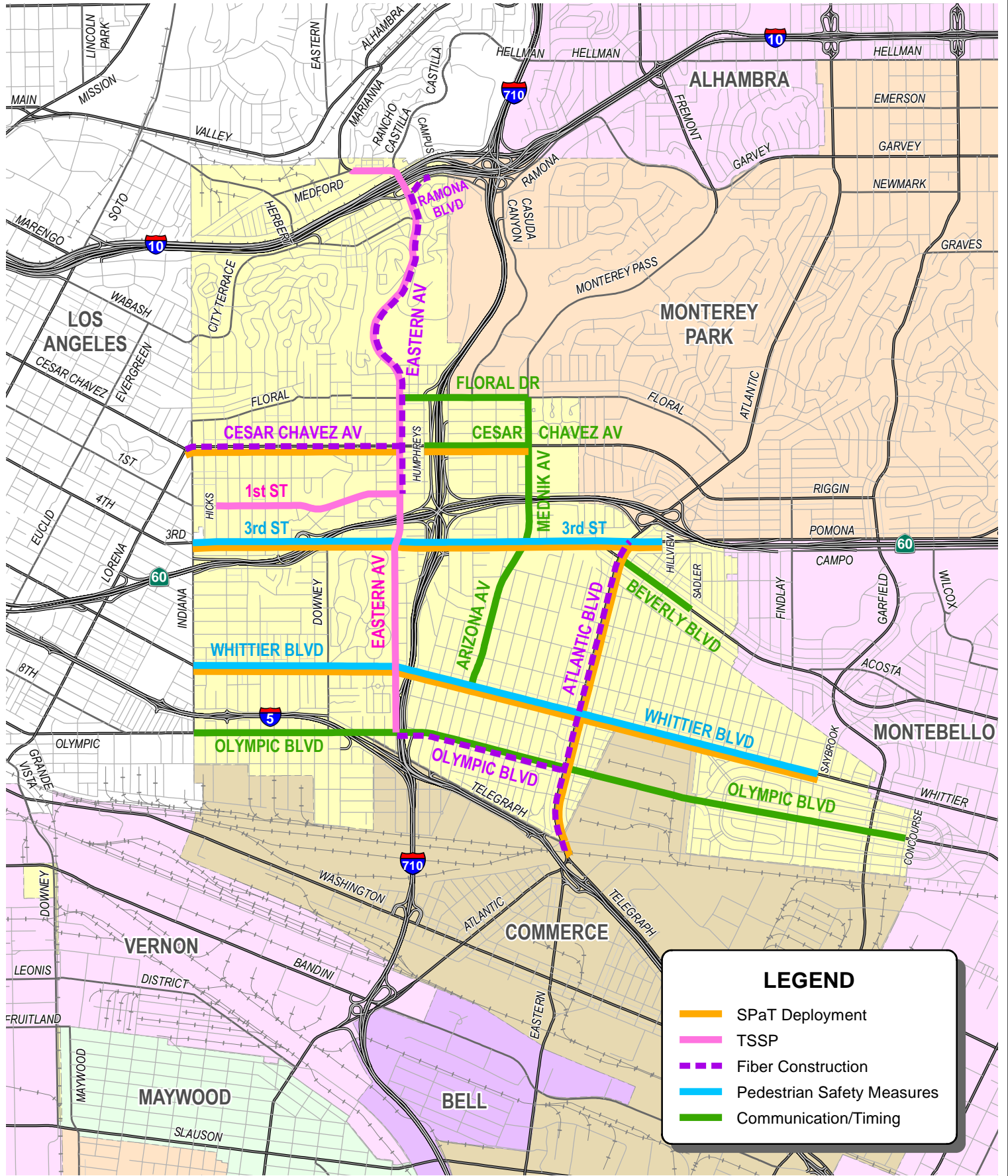
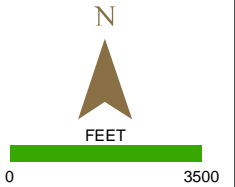
Corridor	PREDICTED ROUTES Based on completed studies. Limits		Miles	J/S	A.D.T.	Veh. Time (hrs)	Fuel (gal.)	Pollution Reduction			Veh. Time, Veh. Wear & Gas	Collision History (w/ I/S)		Collision History (w/o I/S)	
	Indiana Street to Saybrook Avenue	Indiana Street to Concourse Avenue						Hicks Avenue to Eastern Avenue	Indiana Street to Hillview Avenue	Lorena Street to Mednik Avenue		3rd Street to Telegraph Road	Eastern Avenue to Mednik Avenue	Atlantic Boulevard to Sadler Avenue	Eastern Avenue to Campus Road
Whittier Boulevard	3.3	24	29,838	183,675	222,430	9,675	104,192	2,986	\$2,690,791	795	305	296	490		
Olympic Boulevard	3.8	23	23,942	150,676	182,486	7,938	85,482	2,450	\$2,207,692	822	296	526			
1st Street	1.0	9	14,933	31,637	38,306	1,666	17,943	514	\$463,371	98	24	74			
3rd Street	2.4	15	16,606	67,493	81,741	3,556	38,290	1,097	\$988,887	253	91	162			
Cesar Chavez Avenue	1.8	12	20,310	64,240	77,798	3,384	36,443	1,045	\$941,165	396	171	225			
Atlantic Boulevard	1.7	11	20,363	60,386	73,133	3,181	34,258	982	\$884,745	501	195	306			
Floral Drive	0.7	5	6,366	8,061	9,762	425	4,573	131	\$118,089	109	23	86			
Beverly Boulevard	0.5	4	19,316	18,568	22,483	978	10,531	302	\$271,969	48	15	33			
Ramona Boulevard	0.2	2	16,797	7,158	8,666	377	4,059	116	\$104,813	67	16	51			
Eastern Avenue	3.3	15	17,560	82,014	99,346	4,321	46,538	1,334	\$1,201,982	452	130	322			
Mednik Avenue / Arizona Avenue	1.6	10	14,440	39,127	47,386	2,061	22,197	636	\$573,268	205	110	95			
Total				713,034	863,539	37,562	404,506	11,594	\$10,446,773				2370		



ATTACHMENT E EAST LOS ANGELES

Los Angeles County Department of Public Works

June 2017



LEGEND

- SPaT Deployment
- TSSP
- Fiber Construction
- Pedestrian Safety Measures
- Communication/Timing

Attachment F - Resumes

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