Memorandum

Date: January 16, 2019

To: Transportation Authority Board

From: Joe Castiglione – Deputy Director for Technology, Data & Analysis

Subject: 01/29/19 Board Meeting: Award a Two-Year Professional Services Contract, with an Option to Extend for Two Additional Two-Year Periods, to the University of Kentucky Research Foundation in an Amount Not to Exceed $100,000 for Performance Monitoring and Analysis Services for the Congestion Management Program.

RECOMMENDATION   ☐ **Information**   ☒ **Action**

- Award a two-year professional services contract, with an option to extend for two additional two-year periods, to the University of Kentucky Research Foundation in an amount not to exceed $100,000 for performance monitoring and analysis services
- Authorize the Executive Director to negotiate contract payment terms and non-material terms and conditions

SUMMARY

We are seeking consultant services to provide performance monitoring and analysis services for the Congestion Management Program (CMP). As the Congestion Management Agency (CMA) for San Francisco and in accordance with the state CMP legislation, we monitor the CMP roadway network for level of service (LOS) on a biennial basis. Although not specifically required by the CMP legislation, we also monitor transit speeds and transit reliability and collect data related to pedestrians and bicycles as a measure of multi-modal system performance. We issued a Request for Proposals (RFP) in November. By the proposal due date, we received two proposals. Following interviews with both firms, the multi-agency selection panel recommend award of the contract to the highest-ranking firm: the University of Kentucky Research Foundation.

☐ Fund Allocation
☐ Fund Programming
☐ Policy/Legislation
☐ Plan/Study
☐ Capital Project
   Oversight/Delivery
☐ Budget/Finance
☒ Contract/Agreement
☐ Other:
_____

DISCUSSION

Background.

Every two years, the Transportation Authority prepares the CMP for San Francisco. This program is conducted in accordance with state law to monitor congestion and adopt plans for mitigating traffic congestion that falls below certain thresholds. The purpose of 2019 CMP is to:

- Define San Francisco's performance measures for congestion management;

- Report congestion monitoring data for San Francisco county to the public and the Metropolitan Transportation Commission (MTC);
- Describe and synthesize San Francisco's congestion management research, strategies and efforts (infrastructure/capital investment, land-use and Travel Demand Management policies); and
- Outline the congestion management work program for Fiscal Years 2019/20 and 2020/21.

We are seeking consultant services to assist with monitoring vehicle LOS on close to 250 directional roadway segments in San Francisco, during AM and PM peak hours. The LOS measure is primarily derived from private commercial traffic speed data (INRIX) made available to the Transportation Authority at no cost by MTC. At locations where INRIX data does not provide adequate coverage, the consultant will conduct floating car runs.

Although not specifically required by the CMP legislation, we also monitor transit speeds, transit reliability, and auto-transit speed ratios on CMP segments using Automated Passenger Counter data. In addition, we collect multi-modal traffic counts at several key intersections to monitor multi-modal system performance. Consultant services are needed to help with data collection, processing, and analysis. The scope of services is included as Attachment 1.

In coordination with the 2017 CMP, we developed a website (congestion.sfcta.org) for visualization and exploration of all historic congestion metrics. The data collected for 2019 CMP will also be used to update this website. Iteris, Inc. held the previous contract and provided vehicle LOS and transit speed monitoring services as part of the 2013, 2015, and 2017 CMP update efforts.

Procurement Process.

We issued a RFP for performance monitoring and analysis services for the CMP on November 2, 2018. We hosted a pre-proposal conference at our offices on November 13, which provided opportunities for small businesses and larger firms to meet and form partnerships. Five firms attended the conference. We took steps to encourage participation from small and disadvantaged business enterprises, including advertising in six local newspapers: the San Francisco Chronicle, San Francisco Examiner, the Small Business Exchange, Nichi Bei, the Western Edition and the San Francisco Bayview. We also distributed the RFP and questions and answers to certified small, disadvantaged, and local businesses; Bay Area and cultural chambers of commerce; and small business councils.

By the due date of December 3, 2018, we received two proposals in response to the RFP. A selection panel comprised of Transportation Authority and San Francisco Municipal Transportation Agency staff evaluated the proposals based on qualifications and other criteria identified in the RFP, including the proposer's understanding of project objectives, technical and management approach, and capabilities and experience. The panel interviewed both firms on December 12. Based on the competitive process defined in the RFP, the panel recommends that the Board award the contract to the highest-ranked firm: the University of Kentucky Research Foundation. The University of Kentucky team distinguished itself based on having a better understanding of project objectives and challenges; specifically, around the multi-modal aspect of San Francisco's CMP. In addition, the University of Kentucky team demonstrated stronger capabilities and experience in delivering data processing and analysis scripts that are essential to make this effort more efficient for future CMP updates.

We will use federal funds to cover a portion of this contract and have adhered to federal procurement regulations. We established a Disadvantaged Business Enterprise (DBE) goal of 16% for this contract, accepting certifications by the California Unified Certification Program. Proposals from both teams

exceeded the DBE goal. The University of Kentucky team includes 42% DBE participation from one subconsultant: African-American-owned Wiltec.

FINANCIAL IMPACT

This contract will be funded by federal Surface Transportation Program funds matched by Prop K sales tax. The adopted Fiscal Year 2018/19 budget includes this year's activities and sufficient funds will be included in future budgets to cover the remaining cost of the contract.

CAC POSITION

The CAC will consider this item at its January 23, 2019, meeting.

SUPPLEMENTAL MATERIALS

Attachment 1 – Scope of Services

Scope of Services

The Transportation Authority seeks vehicle Level of Service (LOS) and transit speed monitoring services to support the 2019 Congestion Management Program (CMP), which will collect traffic speed and transit speeds and report corresponding performance measures, including segment vehicle LOS, for the designated CMP roadway network, as well as assemble and collect multimodal counts at designated locations. Specific tasks include: 1) work program and project management, 2) LOS monitoring and data analysis, 3) traffic counts, 4) transit speed monitoring, 5) transit volume monitoring, 6) transit coverage, 7) preparation of the draft speed and LOS monitoring report and 8) preparation of the final report. The tasks are detailed below:

TASK 1 – Work Program and Project Management

The Contractor will work with Transportation Authority staff to prepare a Work Program for the scope of services described herein. The Work Program will be a detailed plan of the study procedures and process. The Contractor will clearly describe the firm's approach and schedule for completing the Work Program, which will build on the Transportation Authority's experience from previous LOS monitoring cycles. The Transportation Authority and the Contractor will mutually agree upon the Work Program.

The 2019 project schedule is shown in the table below.

Schedule

Kick-off meeting	February 2019
2019 Monitoring and Data Analysis	April-May 2019
2019 Draft Report	October 2019
2019 Final Report	November 2019

Deliverables:
   1. *Work Program*
   2. *Detailed Schedule*

TASK 2 – LOS Monitoring & Data Analysis

The Contractor will assemble private commercial traffic speed data (INRIX) for spring 2019 to generate speed, LOS, and travel time data at the CMP segment level. For purposes of this data assembly effort, the AM peak period is from 7:00 a.m. to 9:00 a.m. and the PM peak period is from 4:30 p.m. to 6:30 p.m. Data shall be screened to avoid Mondays and Fridays, holidays, school district breaks, inclement weather, major events such as sporting events or festivals, and any other special incidents. The Contractor will also ensure the results for each segment are based on a sufficient sample size as necessary for accuracy.

The Contractor will conduct floating car runs to collect data for LOS monitoring during the weekday AM and PM peak periods where INRIX data is not provided or is deemed unreliable by both the Contractor and the Transportation Authority for the arterial and freeway segments listed in Appendix 5 of the 2017 CMP (link provided in Section III). The Contractor will identify segments requiring data collection through floating car runs through a review of INRIX data and provide a complete list to the Transportation Authority before conducting data collection runs. For purposes of this data collection effort, the AM peak period is from 7:00 a.m. to 9:00 a.m. and the PM peak period is from 4:30 p.m. to 6:30 p.m. The Transportation Authority reserves the right to substitute any of the

proposed segments with other roadway segments. Data collection shall avoid Mondays and Fridays, holidays, school district breaks, inclement weather, major events such as sporting events or festivals, and any other special incidents. The Contractor will submit progress reports to the Transportation Authority that will include a list of the data collected, the data yet to be collected, data processing steps completed and remaining, data that had to be discarded, any monitoring problems/issues, and an updated schedule.

The Contractor shall clean and process the private commercial traffic speed data (INRIX) and the floating car run data for the same timeframe (spring 2019) to generate speed, LOS, and travel time data at the CMP segment level. Again, data shall be screened to avoid Mondays and Fridays, holidays, school district breaks, inclement weather, major events such as sporting events or festivals, and any other special incidents. The Contractor will also ensure the results for each segment are based on a sufficient sample size as necessary for accuracy. The Contractor will calculate LOS based on both the Highway Capacity Manual (HCM)-1985 (all CMP segments) and HCM-2000 (interrupted flow urban street segments only) methodologies for the existing network segmentation. This information, as well as the raw data, will be submitted to the Transportation Authority in a spreadsheet compatible with the Transportation Authority's transportation analysis database. The Contractor will report speed, LOS, and travel time data at the CMP segment level.

The Contractor will submit progress reports to the Transportation Authority that will include a list of the data collected, the data yet to be collected, data processing steps completed and remaining, data that had to be discarded, any monitoring problems/issues, and an updated schedule. A geo-database (compatible with ArcGIS Desktop 10.0) will be submitted to the Transportation Authority (in addition to the spreadsheets) and will include applicable attributes. The Contractor will provide Python scripts used for processing the INRIX data to produce the final cleaned data set.

Deliverables:
1. *LOS data collection progress reports*
2. *Speed and LOS spreadsheets*
3. *Geo-database of speed and LOS data*
4. *Python scripts for processing INRIX data*

TASK 3 – Traffic Counts

The Contractor will collect traffic volume and/or turning movement data on segments or at intersections to be specified by the Transportation Authority. The Contractor shall clean and process the data to generate the required outputs. The Contractor will also assemble counts from the Caltrans Performance Measurement System (PeMS) and Caltrans Count Census for key locations, and will clean and process the data to generate the required outputs.

For count locations specified by the Transportation Authority as 48 half-hour machine count locations, counter placement shall be positioned within the boundaries specified by the Transportation Authority unless otherwise approved by the Transportation Authority's project manager. Digital photographs shall be taken at each count location clearly showing the number of lanes, median type, and hose location. The location and orientation of each photo shall be noted within the filename of each photo. The count locations shall be accurately recorded in latitude and longitude decimal degrees to at least five decimal places. Such locations shall be established using Global Positioning System (GPS) technology. Latitude and longitude coordinates shall be based on the Universal Transverse

Scope of Services

Mercator (UTM) coordinate system. All machine counts will provided in a spreadsheet format compatible with the Transportation Authority's "Count Dracula" count database.

For count locations specified by the Transportation Authority as 48 half-hour turning movement counts, digital photographs shall be taken at each count intersection. The location and orientation of each photo shall be noted within the filename of each photo. At each intersection approach, the number of lanes and usage of each (left, right or thru) at the stop line shall be recorded. If a manual count is used, a camcorder shall be set on a tripod beside the technician to record the same traffic for the entire counting duration. The Contractor is not required to conduct video review except in instances where a quality review suggests the reported data to be incomplete or incorrect in some way; however video files will serve as a ground truth for future data analysis or in the case that data must be verified. Bicycles, counted in the same manner as other roadway vehicles but reported separately, and the number of pedestrian crossings at each approach of intersection shall be a part of the intersection Turning Movement Count data collection. All turning movement counts will provided in a spreadsheet format compatible with the Transportation Authority's "Count Dracula" count database.

The Contractor will review the traffic count data provided by any subcontractors to ensure its reasonableness. If issues are encountered, these will be raised with the Transportation Authority for direction on how to proceed. Traffic count data will be provided in a format agreed upon by the Contractor and the Transportation Authority, and will include traffic volumes, turning movements (where specified as a turning movement count), digital photographs and count location description information.

For count locations specified by the Transportation Authority from PeMS and the Caltrans Count Census, the Contractor will develop scripts to collect and summarize average counts for typical weekdays, Saturdays and Sundays at a half-hour resolution. The Contractor will also investigate PeMS back-end database to identify the integration of Caltrans Count Census data into PeMS, if any, based on the available census stations in the City and County of San Francisco. The Contractor will identify and use the most appropriate channel to access and analyze the Caltrans Count Census data (i.e., via PeMS backend/PeMS clearing house/Caltrans Traffic Census Program webpage. For count locations specified by the Transportation Authority from PeMS and the Caltrans Count Census, the Contractor will develop scripts to collect and summarize average counts for typical weekdays, Saturdays and Sundays at a half-hour or other user-defined data resolution.

The Contractor will submit progress reports to the Transportation Authority that will include a list of the data collected, the data yet to be collected, data processing steps completed and remaining, data that had to be discarded, any monitoring problems/issues, and an updated schedule.

Deliverables:
1. *Traffic count data collection progress reports*
2. *Spreadsheets with machine counts at half-hour resolution*
3. *Spreadsheets with turning movement counts at half-hour resolution*
4. *Spreadsheets with PeMS/Caltrans Count Census counts at half-hour resolution*
5. *Technical memorandum outlining the methodology for PeMS/Caltrans Count Census Data Processing*
6. *Python scripts to collect and process PeMS and Caltrans Count Census data*

Scope of Services

TASK 4 – Transit Speed Monitoring

The Transportation Authority will provide the Contractor with a set of raw transit (Automatic Vehicle Location (AVL)/Automatic Passenger Count (APC)) data for the same AM and PM peak periods as the LOS monitoring performed in a prior contract in order to provide for direct transit-to-auto comparisons. The Transportation Authority will provide the data in a single submittal. The Contractor will utilize Geographic Information System (GIS) and database processing tools developed in the prior contract to clean the data and summarize transit performance. The Contractor will provide transit speeds, segment travel time and travel time variability, and transit-to-auto speed ratios by CMP network segment for all segments on which surface transit is operated.

Deliverables:
1. *Spreadsheets and geo-databse with transit speeds, transit-to-auto speed ratios, and reliability (variability)*
2. *Technical memorandum outlining methodologies and assumptions used to create transit database processing tool and outputs*
3. *Python scripts to process AVL and APC for generating transit speeds, segment travel time and travel time variability, and transit-to-auto speed ratios by CMP network segment for all segments on which surface transit is operated*

TASK 5 – Transit Volume Monitoring

The Transportation Authority will provide the Contractor with a set of raw APC data and station flow data for all 24-hours for all major transit operators serving San Francisco, which the Contractor will analyze in order to calculate transit boardings, alightings and loads by time-of-day. The Transportation Authority will provide the data in a single submittal. The Contractor will provide average boardings, alightings, loads at key cordons at a 30-minute resolution for typical weekdays, Saturday and Sunday. Note that balancing or adjusting the alightings and boardings are not a part of this task. If the Contractor identifies this to be a major issue, it will be brought to the Transportation Authority's attention, with recommendations on plausible methods to reconcile the observed discrepancies.

Deliverables:
1. *Spreadsheets with average boardings, alightings, loads at key cordons at a 30-minute resolution for typical weekdays, Saturday and Sunday*
2. *Technical memorandum outlining methodologies and assumptions used to create transit database processing tool and outputs*

TASK 6 – Transit Coverage

The Contractor will research transit coverage performance measures and recommend a preferred measure or small set of performance measures that can be tracked over time using existing data sources, such as stop density, geographic coverage by population, employment density, etc. The Contractor will document the inputs and processing steps required to compute the recommended performance measure after confirming the measure with Transportation Authority staff.

Deliverables:
1. *Spreadsheets and transit coverage performance measures*
2. *Technical memorandum outlining transit coverage performance measure methodology and assumptions*
3. *Python script(s) for producing transit coverage metric(s)*

TASK 7 – Draft 2019 Speed, Volume, and LOS Monitoring Report

Scope of Services

The Contractor will produce a draft report that includes:

- Information on construction or other temporary conditions that appear to impact any of the monitored segments;

- Tabulations comparing LOS measurements (using both HCM-1985 and HCM-2000 criteria to facilitate comparisons), transit speeds, and transit-to-auto speed ratios for each segment to those obtained in previous years;

- Tabulations showing traffic volume data collected in 2019, compared to previous counts at similar locations, if available (to be provided by the Transportation Authority);

- GIS maps illustrating the monitored network and observed LOS conditions (using both HCM-1985 and HCM-2000 criteria to facilitate comparisons), traffic volumes, and transit speeds;

- Identification of segments with LOS F and whether they a) may need follow-up monitoring or deficiency planning, or b) are exempt from deficiency planning requirements. The Transportation Authority may be required to conduct deficiency planning if a non-exempt segment is found to be at LOS F for the past two monitoring cycles. Monitored segments with LOS F that are not exempt may require additional data collection equivalent to two floating car runs to verify the LOS F finding.

- A general summary/analysis of citywide speed, volume, and LOS, with trends for the same, including the percentages of the network where speeds have increased, decreased, or remained the same and an identification of segments that are contributing significantly to overall trends; and

- A set of citywide metrics such as an average citywide freeway speed, an average citywide arterial speed, and an average transit speed based on the CMP segments monitored in this cycle.

Deliverable:
1. *Spring 2019 Speed and LOS Monitoring Draft Report (digital format)*

TASK 8 – 2019 Final Report

Following one round of review of the draft report and consultation with the Transportation Authority, the Contractor will provide a final report containing revisions and clarifications as necessary. The final report will also include a digital copy of all tabulations, spreadsheets, databases, and GIS files.

Deliverables:
1. *Final Report (five hard copies and one digital copy)*
2. *Final Monitoring Results Spreadsheets/Database/GIS (digital format)*