



METROPOLITAN
TRANSPORTATION
COMMISSION

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September XX, 2021

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Azalea Mitch
Director of Public Works
City of San Mateo
330 W 20th Ave
San Mateo, CA 94403

RE: PASS FY 21/22 Joint Funding Agreement

Dear Ms. Mitch:

This letter, effective as of August 1, 2021 ("Effective Date"), is the agreement between the City of San Mateo ("AGENCY") and the Metropolitan Transportation Commission ("MTC") for developing and implementing traffic signaling coordination plans for the Program for Arterial System Synchronization (PASS) FY 21/22 project, which will be jointly funded by MTC and AGENCY ("the Agreement"). AGENCY's application for the FY 21/22 PASS cycle submitted April 16, 2021, is incorporated herein by this reference.

1. It is agreed that with funding under this Agreement, MTC shall engage its consultant, DKS Associates ("Consultant"), to perform the project work, including but not limited to those specified in Attachment A, Scope of Work, attached hereto and incorporated by this reference.
2. Consultant's work will be performed under the direction of Robert Rich, MTC Project Manager (herein "MTC Project Manager").
3. The effective date of Consultant's agreement with MTC is August 1, 2021 and Consultant's work is expected to be completed by June 30, 2022.
4. MTC shall furnish ten (10) GPS clocks that AGENCY shall install and configure at the project locations identified in Attachment A, Scope of Work.
5. MTC will pay Consultant up to thirty thousand dollars (\$30,000) as full compensation for the satisfactory completion of all services contained in the attached scope, as set forth in Attachment B, Project Budget. AGENCY shall forward MTC its agreed-upon portion of PASS project cost of seven thousand seven hundred forty-seven dollars (\$7,747).

6. MTC shall invoice AGENCY in the amount of seven thousand seven hundred forty-seven dollars (\$7,747) billable in lump sum upon the first month after the start of work by Consultant. AGENCY shall pay MTC fully upon receipt of an invoice in the amount stated above within thirty (30) days of receipt. MTC's invoice shall be mailed to:

Attention: Michael Kato
Associate Engineer
City of San Mateo
330 W 20th Ave
San Mateo, CA 94403

7. All notices or other communication to either party by the other shall be deemed given when made in writing and delivered, mailed, emailed or faxed to such party at their respective addresses as follows:

To MTC: Attention: Robert Rich
Metropolitan Transportation Commission
375 Beale Street, Suite 800
San Francisco, CA 94105
Email: rrich@bayareametro.gov

To AGENCY : Attention: Michael Kato
Associate Engineer
City of San Mateo
330 W 20th Ave
San Mateo, CA 94403
Email: mkato@cityofsanmateo.org

8. Performance will begin on the date this Agreement is fully executed and be completed by June 30, 2022.

If you agree, please sign both copies of this letter in the space provided below. Please return one copy to us. The other copy is for your records.

Very truly yours,

Therese W. McMillan
Executive Director

Accepted and Agreed to:

Azalea Mitch, Director of Public Works
City of San Mateo

DATE:

ATTACHMENT A
SCOPE OF WORK

The services to be performed by Consultant are presented in the following pages excerpted from Deliverable 1B (Final Scope, Schedule and Budget) for AGENCY's FY 21/22 PASS project.

PROJECT UNDERSTANDING

The City of San Mateo received a Program for Arterial System Synchronization (PASS) grant from the Metropolitan Transportation Commission (MTC) to synchronize six (6) traffic signals along the 19th Avenue-Fashion Island Boulevard corridor, three (3) traffic signals along the Concar Drive corridor, and one (1) signal along S. Delaware Street.

The number of traffic signals for each of the two jurisdictions is listed in Table 1. The study intersections are listed in Table 2.

TABLE 1: NUMBER OF SIGNALS PER AGENCY

#	AGENCY NAME	CORRIDOR	NUMBER OF SIGNALS
1	City of San Mateo	19 th Avenue-Fashion Island Boulevard	4
2	Caltrans	19 th Avenue-Fashion Island Boulevard	2
3	City of San Mateo	Concar Drive	2
4	Caltrans	Concar Drive	1
5	City of San Mateo	S. Delaware Street	1
TOTAL NUMBER OF TRAFFIC SIGNALS			10

TABLE 2: STUDY INTERSECTIONS

#	INTERSECTION	SIGNAL OWNERSHIP	SIGNAL OPERATIONS AND MAINTENANCE
1	19th Avenue/S. Delaware Street	Caltrans	Caltrans
2	19th Avenue/Grant Street	City of San Mateo	City of San Mateo
3	19th Avenue/Fashion Island Boulevard	City of San Mateo	City of San Mateo
4	Fashion Island Boulevard/US-101 Southbound Ramps	Caltrans	Caltrans
5	Fashion Island Boulevard/S Norfolk Street	City of San Mateo	City of San Mateo
6	Fashion Island Boulevard/Mariners Island Boulevard	City of San Mateo	City of San Mateo
7	Concar Drive/S. Grant Street	City of San Mateo	City of San Mateo
8	Concar Drive/S. Delaware Street	City of San Mateo	City of San Mateo
9	Concar Drive/SR-92 Westbound Ramps	Caltrans	Caltrans
10	S. Delaware Street/Bermuda Drive	City of San Mateo	City of San Mateo

The goal of this project is to update the traffic signal timing plans for weekday a.m., midday, p.m. peak periods to reduce traffic congestion along the 19th Avenue-Fashion Island Boulevard, Concar Drive and S. Delaware Street corridors. This is expected to result in the reduction of traffic delays, emission of harmful greenhouse gases, reduce automobile travel time along the study corridors, and improve traffic safety.

The intersections at 19th Avenue and Grant Street, 19th Avenue and Fashion Island Boulevard/YMCA Driveway, and Fashion Island Boulevard and Norfolk Street are currently running a coordination plan during the PM peak period. However, the date of implementation is unknown and the City has since updated timing parameters (yellow and walk/don't walk clearance intervals) at the intersections based on 85th percentile speeds. The remaining study intersections are currently running free in the AM and PM peak periods.

The 19th Avenue-Fashion Island Boulevard corridor serves as an alternate route for commuters bypassing State Route 92 during an incident. According to agency staff, the westbound direction

along 19th Avenue between US 101 Southbound ramp and Norfolk Street experiences heavy congestion during the AM Peak. During the PM peak, the corridor experiences heavy congestion between S. Delaware Street and mariners Island Boulevard. The Concar Drive and S. Delaware Street corridors provide connectivity to SR-92. The S. Delaware Street corridor also provides connectivity to Hillsdale Boulevard to the south. The project will cross-coordinate all three corridors to improve traffic progression within the project area.

The study signals use a combination of video and loops for detection.

The intersections at Concar Drive and SR-92 Ramps, Concar Drive and S. Delaware Street, S. Delaware Street and 19th Avenue/SR-92 WB ramps, and S. Delaware Street & Bermuda Drive are part of the SMART Corridor infrastructure and are connected to a hub at the San Mateo Police Department's building at the intersection of Franklin Parkway and Saratoga Drive by fiber optic cable.

There is a six pair copper SIC between the intersections of 19th Avenue and Grant Street, 19th Avenue and Fashion Island Boulevard, and Fashion Island Boulevard and US-101 southbound Ramp. However, the SIC is not terminated at the City owned intersections.

All ten study signals will need GPS clocks for an accurate time source for synchronization.

The City has provided turning movement counts collected in 2019 at all study intersections and ADT tube counts along the 19th Avenue-Fashion Boulevard corridor, also collected in 2019. This project is a standard PASS project involving a description of existing conditions, analysis of traffic signal coordination and traffic safety needs leading to recommendations for signal operations and draft timing sheets. A Final Project Report, which would consist of a summary of all deliverables, and benefit-cost evaluation to estimate the degree of public benefit derived from investing in the PASS project will be submitted to the City of San Mateo and MTC. The final timing sheets and Synchro model will be submitted after fine-tuning and implementation. Final deliverables will be in both hard copy format and electronic format. Upon completion of the project, DKS will submit a ZIP file containing all of the project files.

SCOPE OF SERVICES

The Scope of Services for the project will be conducted in accordance with the Standard Scope of Work, Schedule and Budget for the PASS Consultants and based on discussions with the Agencies involved in the project.

The PASS Standard Scope of Work, Schedule, and Budget document is attached to this scope, schedule, and budget.

The following outlines additions, clarifications, and/or deletions only to the Standard Scope of Work.

TASK 1.0: PROJECT START-UP

The Kickoff meeting was held on August 6, 2021. No changes or clarifications are needed.

DELIVERABLES:

- Task 1A: Draft Scope of Work, Schedule, and Budget
- Task 1B: Final Scope of Work, Schedule, and Budget

TASK 2.0: ANALYSIS OF EXISTING CONDITIONS

DKS will obtain an aerial photo and scalable map of the study corridors from Google maps. The City of San Mateo has provided a schematic of the traffic signal system, and the timing sheets for the study intersections. The data will be used to develop synchro models for the corridor analysis and development of the traffic signal timing plans.

DATA COLLECTION

Due to the uncertain traffic conditions resulting from the current Covid 19 pandemic, DKS intends to use the 2019 traffic counts provided by the City. To confirm this and gain a better perspective of current traffic conditions, we shall conduct field observations.

Travel Time and Delay Studies

The travel time and delay studies will be conducted for 19th Avenue-Fashion Boulevard from S. Delaware Street to Mariners Island Boulevard. A minimum of four runs per direction for each study peak period will be conducted. We will collect performance metrics including travel time, traffic signal delay, number of stops, and the travel speeds along the study corridor.

For this project, the "Before" travel time survey will be conducted before the implementation of the new timing plans and the "After" travel time survey will be conducted after two weeks of the implementation and fine-tuning of the timing plans. The results from the travel time survey will be used for the evaluation of the project.

Traffic Signal Timing Software

CUBIC/Trafficware's Synchro version 10 software will be used to conduct the signal timing analysis.

DELIVERABLES

- Task 2A: Draft Existing Conditions Report
- Task 2B: Final Existing Conditions Report

DKS will compile and analyze all data collected and prepare an existing conditions report or technical memorandum that summarizes the results of the analysis. DKS will submit a draft existing conditions report for City of San Mateo to review. Upon receipt of the comments, DKS will submit a final version of the report including a response to comments memorandum.

TASK 3.0: DEVELOPMENT OF TIMING PLANS RECOMMENDATIONS

DKS will provide a brief memorandum prior to the draft recommendations report discussing the proposed cycle lengths and groupings of signals into subsystems. A meeting will be scheduled to review the draft recommendations as included in the Scope of Work.

No transit priority and traffic responsive settings are included as part of this Scope of Services.

Consistent with the 2014 California Manual of Uniform Traffic Control Devices (CAMUTCD), a walking speed of 3.5 feet per second (ft. /sec) will be used to determine pedestrian clearance time (Flash Don't Walk) for City traffic signals.

The City of San Mateo prefers a minimum walk interval of at least seven (7) seconds per CAMUTCD Section 4E.06:1.1. Per CAMUTCD 4E.06, leading pedestrian interval may be considered for locations with high pedestrian traffic volumes and high conflicting turning vehicle volumes.

DKS will work with the City of San Mateo and Caltrans staff to review the actuated settings used and make recommendations for improving these settings where necessary. The yellow change interval will be determined based on CAMUTCD Section 4d.2:14 to 15. However, the red interval will be determined based on recent ITE recommended practice and guideline. Additionally, per the 2014 CAMUTCD, DKS will update the minimum green timing for traffic signals to accommodate bicyclists at all approaches.

Our analysis will include optimizing cycle lengths, splits and off sets, and phase sequence.

DELIVERABLES

- Task 3A: Draft Recommendations Report
- Task 3B: Revised Recommendations Report

DKS will submit a draft recommendations report for both City of San Mateo and Caltrans to review. After receiving and addressing agencies staff comments on the draft timing plans recommendations, a final timing plans recommendations will be submitted for implementation. A response to comments memorandum will also be submitted along with the final report.

TASK 4.0: IMPLEMENTATION AND EVALUATION

An "After" travel time survey will be conducted after the field fine-tuning to evaluate the implemented and fine-tuned timing plans. Subsequently, DKS will conduct Benefit-Cost Analysis based on the results of the "Before" and "After" travel time surveys.

DKS will assist agencies staff to implement the traffic signal timings on the field. DKS will also work with the City of San Mateo and Caltrans staff to implement timing plans at the 10 traffic signals.

DKS will submit the final timing sheets after implementation and fine-tuning, and a final report for the weekday and weekend peak periods signal timing effort. The reports will contain signal timing evaluation, and benefit and cost analysis results.

DELIVERABLES

- Task 4: Preliminary Implementation and Fine-tuning of Timing Plans
- Task 4A: Draft Project Report with Benefit-cost Analysis
- Task 4B: Final Project Report with Benefit-cost Analysis

The deliverables will include the implementation and fine-tuning of the timing plans, a draft project report that summarizes all elements of the project, and a final project report with all project deliverables including the Synchro models and a response to the draft comments’ memo.

SCHEDULE

DKS shall provide the services in accordance with the schedule presented in Table 3.

TABLE 3: PROJECT SCHEDULE

TASKS	DELIVERABLES	ESTIMATED COMPLETION DATE
1A	Draft Scope of Work, Schedule, and Budget (Deliverable #1A)	Completed
	City of San Mateo/MTC Review	Completed
1B	Final Scope of Work, Schedule, and Budget (Deliverable #1B)	Completed
	Data Collection (part of Task 2)	September 30, 2021
	Field Review (part of Task 2)	September 30, 2021
2A	Draft Existing Conditions Report (Deliverable #2A)	October 29, 2021
	City of San Mateo and Caltrans Review	November 12, 2021
2B	Final Existing Conditions Report (Deliverable #2B)	November 26, 2021
3A	Draft Recommendations Report (Deliverable #3A)	December 10, 2021
	City of San Mateo and Caltrans Review	December 23, 2021
3B	Final Recommendations Report (Deliverable #3B)	February 15, 2022
	Timing Sheets	March 28, 2022
	City of San Mateo and Caltrans Review	April 11, 2022
4	Preliminary Implementation and Fine-tuning (Deliverable #4)	April 25, 2022
4A	Draft Project Report with Benefit-Cost Analysis (Deliverable #4A)	May 16, 2022
	MTC Review	May 23, 2022
	Final Project Report with Benefit-Cost Analysis (Deliverable #4B)	June 14, 2022

The schedule assumes that traffic data and review of deliverables will be conducted in a timely manner and in accordance with the above schedule.

ATTACHMENT A1 PASS Standard Scope of Work

The services to be performed by Consultant shall consist of services requested by the MTC Project Manager or a designated representative. At the beginning of each annual project cycle, all selected Consultant shall meet with the MTC Project Manager to discuss various aspects of the PASS, such as program guidelines, logistics, services, invoices, communication preferences, etc. Caltrans staff will also participate in this meeting to discuss their signal timing preferences, if applicable. The electronic files of all project deliverables shall be clearly named and dated. The project administration guidelines applicable to the particular Cycle of PASS projects shall be reviewed and discussed at this meeting. The standard scope of work, schedule and budget for a typical PASS project includes, but is not limited to, the following:

1. Project Kick-off

- 1.1. Consultant shall coordinate a kick-off meeting with the project sponsors, and MTC Project Manager or designated representative. This meeting will help to understand the roles and responsibilities of each stakeholder; establish communication channels; discuss the deliverable review preferences for each stakeholder; discuss in detail the scope of work, schedule, and budget; understand the needs and requirements of all stakeholders; gather available data and information; and obtain a thorough understanding of the goals of the project.
- 1.2. Consultant shall have the opportunity to discuss with the project sponsors and other stakeholders their preferences for signal timing, cycle length preferences, status of corridor equipment, anticipated construction activities, any helpful “do’s and don’ts, and other project related information.
- 1.3. Consultant shall prepare the *Deliverable 1A: Draft Scope of Work, Schedule and Budget report* for review by the project sponsors and the MTC Project Manager. This report shall include all the details discussed in the kick-off meeting. Consultant shall address all of the comments received and submit a revised report to the MTC Project Manager for final approval. The approved version will be considered the *Deliverable 1B: Final Scope of Work, Schedule, and Budget (SSB)* for the project.
- 1.4. Consultant shall revise the SSB if any significant changes are required or requested in the approved version during any stage of the project. The revised version shall include the nature and details on all of the changes with a revised date and title. Consultant may also be asked to perform any additional services described in detail in Task 5: *Additional Services* at any stage of the project.

Deliverable 1A:	Draft Scope of Work, Schedule, and Budget
Deliverable 1B:	Final Scope of Work, Schedule, and Budget (SSB)

2. Analysis of Existing Conditions

Consultant shall collect and analyze all the data necessary to thoroughly understand existing traffic conditions in the project corridors. This stage of the project includes data collection and analysis, thorough field observations, input from signal maintenance staff, contractors, vendors, etc. regarding any pertinent issues in the project corridors. The purpose of this task is to help the project sponsors and other stakeholders understand the current traffic conditions in the project corridors, such as traffic patterns, volumes, peak hours, bottlenecks, collision history, hot spots, etc.

2.1. Data Collection and field reviews – Consultant shall collect all the data as listed in Deliverable 1B: Final Scope of Work, Schedule and Budget (SSB).

- 2.1.1. Consultant shall collect existing timing sheets, coordination plans, traffic signal as-built drawings, aerial photos and maps, corridor and intersection collision data for three years, Synchro and other computer models and data, if available, from the project sponsors and other stakeholders.
- 2.1.2. Consultant shall conduct peak period turning movement counts at all study intersections, including pedestrian and bicycle counts, and seven-day 24-hour machine counts (ADT Counts) with vehicle classifications at strategic locations to determine periods of coordination. All counts shall be taken during times and days that are representative of the times and days for which coordination plans shall be developed. No counts shall be taken during the weeks with holidays or school breaks, or on the days where the typical traffic patterns are impacted by construction activity, major incidents, adverse weather conditions, etc.
- 2.1.3. Consultant shall collect turning movement counts along with bicycle and pedestrian counts, using video data collection technologies. MTC prefers this method, as the videos help to review any data collection errors, if needed. Consultant shall provide access to the raw counts, videos, formatted data, via an FTP site or other web-portals approved by all of the stakeholders. Other data collection methods shall be considered based on the preference of the project sponsor or if video data collection is not feasible. Consultant shall take all the steps possible to provide the data to the project sponsors in any or all formats, such as PDF, MS Excel and/or Synchro computer models.
- 2.1.4. Consultant or their authorized subcontractors' costs for collecting the turning movement counts, with bicycle and pedestrian counts at all project intersections, is included in the project budget per intersection. The ADT or the seven-day 24-hour machine counts are included in the project costs, at the rate of one ADT count for every four project signals. Any additional counts have to be approved by MTC, and billed at a negotiated rate.

- 2.1.5. Consultant shall provide the MTC Project Manager electronic files of all turning movement counts, bicycle and pedestrian counts, ADT counts, collision data, all developed Synchro models, controller and cabinet photos, and any other project related data when requested or at the end of the project, whichever is earliest.
 - 2.1.6. Consultant shall conduct thorough field reviews at all study intersections and street segments to verify lane geometry, speed limits, storage lengths, signal phasing, distances between intersections, and crosswalk lengths, even if the information is available through other sources, such as aerial photos and speed surveys. Consultant shall conduct extensive field reviews at key intersections to measure queue lengths and saturation flows for heavy movements with input from project sponsors.
 - 2.1.7. Consultant shall conduct the “before” travel time data, including the number of stops, during times and days that are representative of the times and days for which coordination plans shall be developed. Consultant shall conduct as many runs as possible within the coordination period, but at least a minimum of four runs shall be conducted for each direction for each peak period. Consultant shall conduct these studies using the floating car method or any method approved by the project sponsors.
 - 2.1.8. Consultant shall verify signal coordination and transit priority capabilities of existing equipment and communications infrastructure. Consultant shall take digital photos of the controller cabinet and the contents of the controller cabinet, at all project locations, unless waived by the project sponsors or MTC.
- 2.2. Analysis of Existing Conditions – Consultant shall analyze the data obtained from Task 2.1 as follows:
- 2.2.1. Consultant shall review initial and actuated settings for each study intersection to identify opportunities to minimize delay during non-coordination periods and enhance pedestrian and bicyclist safety. The analysis shall include, but not be limited to, review of minimum and maximum green settings; yellow and red times; pedestrian timing; and gap, extension, and reduction settings.
 - 2.2.2. Consultant shall analyze the intersection and corridor-wide collision data for at least three years of available data. This data shall be summarized and evaluated to identify any signal timing practices that may help reduce similar potential incidents in the future.
 - 2.2.3. Consultant shall analyze the typical traffic patterns during the peak periods for which coordination plans shall be developed. Consultant shall note factors that generally affect signal progression including, but not limited to: intersections with high pedestrian or bicyclist volumes; over-saturated intersections; uneven lane distribution; high volumes of trucks and buses; and presence and location of bus stops.

- 2.2.4. Consultant shall develop models for each peak period project corridors and calibrate the model based on travel time and delay studies, and field observations of queue lengths and saturation flows for heavy movements at key intersections. Consultant shall use the modeling software as per directions from the project sponsors.
- 2.2.5. Consultant shall summarize the results of the existing conditions analyses in *Deliverable 2A: Draft Existing Conditions Report* for review by the project sponsors and MTC Project Manager. At a minimum, the report shall include the following: project description; project map showing the intersections and services; analysis from the counts; field verification results of the controllers and their communication capabilities; factors that are expected to affect progression; and model calibration results.
- 2.2.6. Consultant shall meet with the project sponsors to discuss the results of the existing conditions analyses and field observations. Consultant shall revise the report after addressing the comments received from the project sponsors. Consultant shall submit a *Response to Comments Report* addressing all the comments/concerns received from all stakeholders, while submitting the *Deliverable 2B: Final Existing Conditions Report* for approval.

Deliverable 2A:	Draft Existing Conditions Report
Deliverable 2B:	Final Existing Conditions Report, including the Response to Comments Report

3. Development of Recommendations

This stage of the project involves the following tasks and deliverables:

- 3.1. Consultant shall develop the optimal time-of-day coordination plans after analyzing the signal grouping; phasing and phase sequence, including conditional service; cycle lengths, splits, offsets; collision diagrams/data and other available data. The Consultant shall meet with the project sponsors or submit an interim deliverable to discuss and agree on the preliminary signal grouping and cycle lengths.
- 3.2. Consultant shall develop recommendations of optimal initial and actuated settings; time-of-day coordination plans and hours of coordinated operation; and transit signal priority plans and hours of operation, if applicable.
- 3.3. Consultant shall summarize recommendations in the *Deliverable 3A: Draft Recommendations Report*. The report shall also include a comparison of existing and proposed timings, the justifications for the recommended changes, and a description of the expected improvements.

- 3.4. Consultant shall follow the applicable state and federal standards in making these recommendations. Any exceptions need to be discussed in detail with the project sponsors and the MTC Project Manager.
- 3.5. Consultant shall meet with the project sponsors to discuss the proposed recommendations, justifications and anticipated improvements. Consultant shall revise the report after addressing the comments received from the project sponsors. Consultant shall submit a *Response to Comments Report* addressing all the comments/concerns received from all stakeholders, while submitting the *Deliverable 3B: Revised Recommendations Report* for approval.

Deliverable 3A:	Draft Recommendations Report
Deliverable 3B:	Revised Recommendations Report, including the Response to Comments Report

4. Implementation and Evaluation

This is the final stage of the project requiring the coordination of all project sponsors and MTC. The various tasks involved in this stage include, but are not limited to, the following:

- 4.1. Consultant shall prepare the appropriate timing sheets in the format requested by the project sponsors for review and approval. Consultant shall revise the timing sheets based on comments received from the project sponsors.
- 4.2. Consultant, with the help of project sponsors, shall implement the new timing plans remotely or in the field. Consultant shall use all the resources required to complete this task effectively, and any short-comings may impact the Consultant performance during the review process. Consultant shall employ enough staff resources to monitor the traffic for the entire duration the new plans are implemented for the first time. This requirement shall be followed any time changes are made to the timing plans during the fine-tuning process. Consultant shall have qualified staff available to immediately address any issues or agency concerns that may result from the implementation of the new timing plans.
- 4.3. Consultant, with the help of project sponsors, shall fine-tune the new timing plans to the satisfaction of the project sponsors. Consultant shall fine-tune timings in the field and record all changes. Fine-tuning shall be conducted during times and days that are representative of the times and days for which coordination plans were developed. This requires additional field visits to verify and assess any changes made during the fine-tuning process.
- 4.4. Consultant shall conduct the “after” travel time and delay studies, including the number of stops, during the new coordination periods. Consultant shall conduct as many runs as

possible within the coordination period, but at least a minimum of four runs shall be conducted for each direction for each peak period. Consultant shall conduct these studies using the floating car method or any method approved by the project sponsors.

- 4.5. Consultant shall calculate measures of effectiveness using the results from the “before” and “after” studies. These measures generally include the travel-time savings, emissions savings, speed increases, reduction in the number of stops, cost savings from reduced emissions and benefit-cost analysis results. The methodology used for these calculations shall be provided or approved by the MTC Project Manager.
- 4.6. Consultant shall submit a *Deliverable 4A: Draft Project Report*, which shall include the following for each PASS project: overview, goals and objectives, corridors and services, project map, results from the data collection and analyses, the preliminary recommendations, new timings implementation, fine-tuning results, comparison of the old and new timings, etc. The report will also include any unique issues that were resolved and any qualitative benefits achieved with the project. The qualitative benefits will generally include the benefits to pedestrians, benefits to bicyclists, effects on transit, traffic safety, etc.
- 4.7. Consultant shall revise the report after addressing the comments received from the project sponsors and the MTC Project Manager. Consultant shall submit a *Response to Comments Report* addressing all the comments/concerns received from all stakeholders, while submitting the *Deliverable 4B: Final Project Report* for approval.
- 4.8. Consultant shall assist MTC in producing Fact Sheets for each project by providing the required maps, tables, data or text as requested by the MTC Project Manager.

Task 4:	Preliminary Implementation and Fine-tuning
Deliverable 4A:	Draft Project Report with Benefit-Cost Analysis, including the computer models
Deliverable 4B:	Final Project Report with Benefit-Cost Analysis, including the computer models and Response to Comments Report

5. Additional Services

In addition to the basic signal coordination plans, the Consultant may also be asked to provide additional services related to the PASS projects. These services shall be requested by the project sponsor in their application and shall be included in the SSB, contingent upon approval by MTC Project Manager. Consultant shall include a detailed description of the scope of the additional service, a staffing plan, and level of effort, additional budget, and payment schedule in the SSB. If the scope of work and budget for these services cannot be reasonably negotiated, MTC, at its sole discretion, can withdraw the project assignment from the Consultant and assign a different Consultant to the project. Additional services may be requested at any stage of the project, as needed, and shall be included in a revised SSB, if approved by the MTC Project Manager.

- 5.1. Consultant may be asked to develop additional timing plans, such as incident management flush plans, transit signal priority plans, traffic responsive timing plans, weekend timing plans, school peak timing plans, etc. Such services may include additional meetings, additional data collection, field visits, technical analyses, studies, fine-tuning, conditional diagrams, etc.
- 5.2. Consultants, with the help of the transit agency, may be asked to review the existing capabilities or conditions of the transit signal priority of buses serving the project corridors. The PASS will also provide help in establishing communication between the signals and buses as this step is crucial to implementing new transit signal priority plans.
- 5.3. Consultant may be asked to work on some pilot tasks/projects to help with the expansion of PASS projects and services. These pilot tasks/projects will help MTC understand the level of effort, budget, and potential benefits to mobility and air quality that could help expand future cycles of the Program. The pilot tasks/projects may include, but not be limited to: development of advanced signal timing plans; Systems Engineering analyses; and ITS Engineering and Design.
- 5.4. Consultant may be asked to perform these additional services for any projects retimed in the last two years under the PASS. These tasks may also include updating coversheets, reformatting timing plans, evaluating the effects of new timing plans, etc.
- 5.5. Consultant may be asked to subcontract an electrical contractor or other firms with required licenses and expertise to install GPS clocks or other communications equipment for certain projects. Consultant may be asked to coordinate the installation of these equipment including assisting the local agencies in securing any permits required for the project.
- 5.6. Consultant may be asked to prepare presentation materials and/or make formal presentations on the PASS project to various policy boards and commissions.
- 5.7. Consultant may be asked to assist in organizing seminars on various topics that contribute to improved mobility and emissions reductions. The typical tasks include developing seminar outlines, securing speakers, preparing presentation materials, etc.

6. Reduced Services

Consultant may be requested to not perform some of the services listed above for certain projects. If reduced services are requested by the project sponsor or the MTC Project Manager, Consultant shall clearly document all relevant details in the SSB. The fee for reduced services shall be a percentage of the base fee per intersection, or a negotiated amount, which is commensurate with the proportion of services reduced. If these cannot be reasonably negotiated, MTC, at its sole discretion, can withdraw the project assignment from the Consultant and assign a different Consultant to the project.

**ATTACHMENT B
 PROJECT BUDGET**

The following table provides the estimated project budget, including the match to be provided by AGENCY.

#	Deliverable Description	MTC Share	AGENCY Share	Total Cost
1A	Draft Scope of Work, Schedule, and Budget (5%)	\$1,313	\$187	\$1,500
1B	Final Scope of Work, Schedule, and Budget (5%)	\$1,313	\$187	\$1,500
2A	Draft Existing Conditions Report (30%)	\$7,875	\$1,125	\$9,000
2B	Final Existing Conditions Report (10%)	\$2,625	\$375	\$3,000
3A	Draft Recommendations Report (15%)	\$3,938	\$562	\$4,500
3B	Revised Recommendations Report (10%)	\$2,625	\$375	\$3,000
4	Preliminary Implementation and Fine Tuning (15%)	\$3,938	\$562	\$4,500
4A	Draft Project Report with Benefit-Cost Analysis (5%)	\$1,313	\$187	\$1,500
4B	Final Project Report with Benefit-Cost Analysis (5%)	\$1,313	\$187	\$1,500
Total Consultant Services		\$26,253	\$3,747	\$30,000
GPS Clocks		\$4,000	\$4,000	\$8,000
Total		\$30,253	\$7,747	\$38,000