

CHANGE ORDER #2

Pursuant to Section 8 of the Agreement an Automated Traffic Signal Performance Measures System (“Agreement”) between the City of San José (“City”) and Econolite Systems, Inc., (“Contractor”), the Agreement is hereby amended as follows:

1. Contractor shall provide the following additional services at the costs indicated below:

Additional Services	Total Cost
Add bicycle metrics to the Mobility Signal Performance Measures (SPM) service.	\$ 14,000
TOTAL NOT TO EXCEED	\$14,000

City shall be invoiced in accordance with Section 1 of Second Revised Exhibit B, Compensation.

2. **Section 9.1 “Contract Maximum” is hereby amended to read as set forth below:**

9.1 Contract Maximum





The total contract price in U.S. dollars shall not exceed **Two Hundred Fifty-Two Thousand Three Hundred Seventeen Dollars (\$252,317)** during the Initial Term (“Maximum Compensation”). The terms, rates, and schedule of payment are set forth in the attached Second Revised Exhibit B, entitled “Compensation.” Contractor shall submit to City invoices at the completion of each milestone, but no more frequently than monthly, with a breakdown of Services as provided in Second Revised Exhibit B. City will make payments to Contractor within thirty (30) days after the date of approval of each invoice. City will make payments when due in the form of a check, cashier’s check, or wire transfer drawn on a U.S. financial institution.

3. **Revised Exhibit A-1.6 entitled System Requirements is hereby amended as set forth in the Second Revised Exhibit A-1.6, which is attached hereto and incorporated herein.**

4. **Revised Exhibit A-1.7 entitled Verification Plan is hereby amended as set forth in the Second Revised Exhibit A-1.7, which is attached hereto and incorporated herein.**

5. **Revised Exhibit B entitled Compensation is hereby amended as set forth in the Second Revised Exhibit B, which is attached hereto and incorporated herein.**

6. **All general terms and conditions of the Agreement not expressly modified by this Change Order shall remain in full force and effect.**

Total Cost of Change	\$14,000
Total Credit of Change	0
Previous Amendments and/or Change Orders	1,550
Original Contract	236,767
NEW NOT-TO-EXCEED CONTRACT AMOUNT	\$252,317
<p>ACCEPTANCE Contractor hereby agrees to accept the amount set forth herein as payment in full for the work described and further agrees that Contractor is not entitled to additional time or compensation for such work except as set forth herein.</p> <p>C  Email: ksteudle@econolite.com Date: 07/25/2022 GMT</p> <hr/> <p>Kirk Steudle S  Email: jtracey@econolite.com Date: 07/25/2022 GMT</p> <hr/> <p>John Tracey Chief Financial Officer</p>	<p>A  Email: diana.yuan@sanjoseca.gov Date: 07/25/2022 GMT</p> <hr/> <p>Diana Yuan Deputy City Attorney</p> <p>C  Email: vickie.davis@sanjoseca.gov Date: 07/25/2022 GMT</p> <hr/> <p>Vickie J. Davis IT & Strategic Procurement Manager</p>

SECOND REVISED EXHIBIT A-1.6 SYSTEM REQUIREMENTS

1 SCOPE

1.1 Document Purpose and Scope

1.1.1 The System Requirements establish the technical scope of the system to be deployed and will be incorporated into the RFP for the ATSPM system. The purpose of the requirements is to identify the technical and non-technical factors that may affect the process of selecting, developing, or modifying an ATSPM system. The requirements are also the basis for verifying (via the Verification Plan) the system that will be deployed.

1.1.2 The requirements are given discrete reference numbers and are measurable and testable individually. They are grouped into functional categories and subcategories and each is identified as either required or desired, described more fully in Section 2 of this document.

1.2 Project Purpose and Scope

1.2.1 The purpose of the project is to deploy operational tools that will enable the City to make informed decisions about operational strategies to improve their traffic signals and the operations of the project corridors, as well as provide the City with necessary data to conduct post-performance monitoring. The tools that will be deployed as part of this project include an ATSPM system, as well as any vehicle and/or pedestrian detection necessary for each performance measure.

1.2.2 The City is proposing to procure a commercially-available off-the-shelf ATSPM system and configure 101 signalized intersections, along 10 arterials, to collect high-resolution data which will enable proactive management of the traffic signal network. The arterials include:

1.2.2.1 Alum Rock Avenue: 33rd Street to Alexander Avenue/Muirfield Drive (8 signals)

1.2.2.2 Hedding Street: Ruff Drive to Monroe Street (6 signals)

1.2.2.3 Saratoga Avenue: Stevens Creek Boulevard to El Paseo de Saratoga (12 signals) plus 5 signals on Campbell Avenue, Hamilton Avenue and Westgate.

1.2.2.4 Stevens Creek: Winchester Boulevard to East of 880 FW (5 signals)

1.2.2.5 Winchester Boulevards: Forest Avenue to Moorpark Avenue (8 signals)

1.2.2.6 Tully Road: Eastridge Lane to 7th Street (18 signals)

1.2.2.7 Coleman Avenue: Aviation Drive/FMC Road to Market/Julian (12 signals)

1.2.2.8 Cottle Road: Endicott Boulevard to Santa Teresa Boulevard (9 signals)

1.2.2.9 Santa Teresa Boulevard: Camino Verde Drive to Park and Ride (4 signals)

1.2.2.10 San Fernando Street Bike Corridor: Montgomery Street to 11th Street (13 signals)

1.2.3 Additional vehicle detection may be required for some of the performance measures, especially Arrivals on Green. It is assumed that all the traffic signal controllers and

controller cabinets will allow for the collection of high-resolution data in each lane. It is anticipated that all the traffic signal controllers will be connected to the central traffic signal system via high speed communications. Therefore, no additional communications infrastructure should be needed for the ATSPM system. A map of the project limits is shown in Figure 1 and a listing of the project intersections is shown in Table 1.

Figure 1. System Project Limits

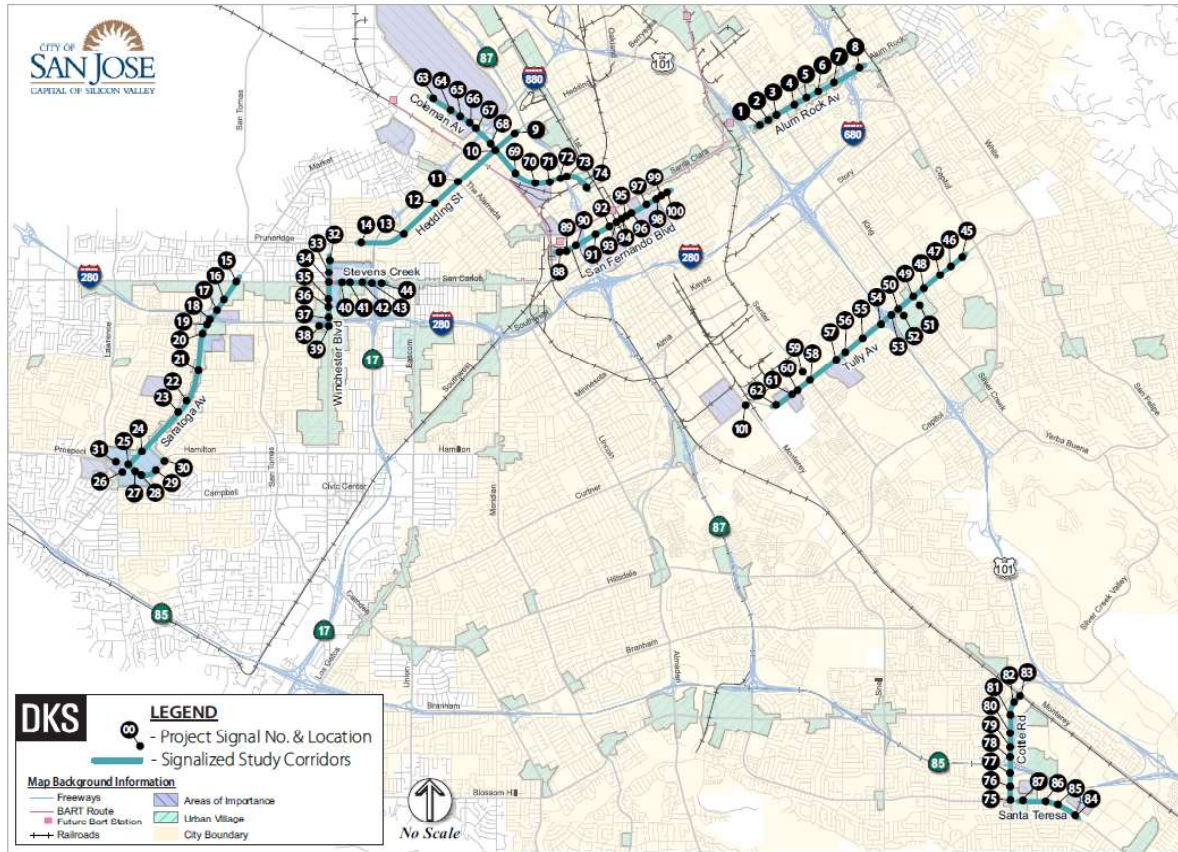


Table 1. Project Intersections

Alum Rock Avenue					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
1041	1	Alum Rock Ave & 33 rd St	1046	5	Alum Rock Ave & Sunset Ave
1053	2	Alum Rock Ave & 34 th St	1047	6	Alum Rock Ave & José Figueres Ave
1044	3	Alum Rock Ave & King Rd	1048	7	Alum Rock Ave & Jackson Ave
1045	4	Alum Rock Ave & McCreery Ave	1051	8	Alum Rock Ave & Alexander Ave
Hedding Street					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
254	9	Hedding St & Ruff Dr	128	12	Hedding St & Park Ave
131	10	Hedding St & Coleman Ave	63	13	Hedding St & Bascom Ave
156	11	Hedding St & The Alameda	178	14	Hedding St & Monroe St

Saratoga Avenue					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
176	15	Saratoga Ave & Stevens Cr Blvd*	278	24	Saratoga Ave & Graves Ave
204	16	Saratoga Ave & Kiely Blvd	133	25	Saratoga Ave & Prospect Rd
264	17	Saratoga Ave & I-280 NB Ramp**	733	26	Saratoga Ave & El Paseo de Saratoga
199	18	Saratoga Ave & I-280 SB Ramp**	345	27	Campbell Ave & Westgate
190	19	Saratoga Ave Moorpark Ave	344	28	Campbell Ave & Hamilton Ave
389	20	Saratoga Ave & Blackford Ave	827	29	Hamilton Ave & Sagemont Ave
180	21	Saratoga Ave & Williams Rd	817	30	Hamilton Ave & Atherton Ave
194	22	Saratoga Ave & Doyle Rd	575	31	Prospect Rd & Westgate West
283	23	Saratoga Ave & Payne Ave			
Winchester Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
584	32	Winchester Blvd & Forest Ave	253	36	Winchester Blvd & Olsen Dr
583	33	Winchester Blvd & Doreich St	198	37	Junipero Serra Fr & Tisch Way**
81	34	Winchester Blvd & Stevens Cr Blvd	126	38	Winchester Blvd & Moorpark Ave
304	35	Winchester Blvd & Olin St	197	39	Moorpark Ave & I-280 SB Off Ramp
Stevens Creek Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
177	40	Stevens Creek Blvd & Santana Row*	540	43	Stevens Creek Blvd & I-880 (W) Off Ramp*
537	41	Stevens Creek Blvd & Valley Fair	1013	44	Stevens Creek Blvd & I-880 (E) Off Ramp
72	42	Stevens Creek Blvd & Monroe St			
Tully Road					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
295	45	Tully Rd & Eastridge Ln	1076	54	Tully Rd & US 101 SB Ramp
294	46	Tully Rd & Eastridge Wy	200	55	Tully Rd & McLaughlin Ave
293	47	Tully Rd & Quimby Rd	404	56	Tully Rd & Lucretia Ave
628	48	Tully Rd & Huran Dr	668	57	Tully Rd & Galveston Ave
292	49	Tully Rd & King Rd	202	58	Tully Rd & Senter Rd
334	50	Tully Rd & Lanai Ave	686	59	Senter Rd & Parrott St
702	51	King Rd & Burdette Dr	914	60	Tully Rd & Valley Health Ctr
870	52	Alvin Ave & Fontaine Rd	351	61	Tully Rd & 10 th St
1075	53	Tully Rd & US 101 NB Ramp	273	62	Tully Rd & 7 th St***
174	101	Monterey & Curtner Ave			
Coleman Avenue					

Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
154	63	Coleman Ave & Aviation Dr	144	69	Coleman Ave & Taylor St
1068	64	Coleman Ave & Earthquakes Wy	971	70	Coleman Ave & San José Mkt Driveway
934	65	Coleman Ave & Newhall Dr	970	71	Coleman Ave & Autumn St
258	66	Coleman Ave & Airport Blvd	586	72	Coleman Ave & Santa Teresa St
425	67	Coleman Ave & I-880 SB Ramp	963	73	Coleman Ave & Guadalupe Pkwy**
962	68	Coleman Ave & McKendrie St	23	74	Coleman Ave & Julian St
Cottle Road					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
343	75	Cottle Rd & Santa Teresa Blvd	1061	80	Cottle Rd & Coronado Ave
449	76	Cottle Rd & Hospital Pkwy	192	81	Cottle Rd & Poughkeepsie Rd
636	77	Cottle Rd & West Valley Freeway N Ramp**	237	82	Cottle Rd & Concord Dr
637	78	Cottle Rd & West Valley Freeway S Ramp**	1032	83	Cottle Rd & Endicott Blvd
499	79	Cottle Rd & Beswick Dr			
Santa Teresa Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
615	84	Santa Teresa Blvd & Park Ride	812	86	Santa Teresa Blvd & Encinal Dr
431	85	Santa Teresa Blvd & Miyuki Dr	437	87	Santa Teresa Blvd & Camino Verde Dr
San Fernando Street					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
85	88	San Fernando St & Montgomery St	40	95	San Fernando St & 3 rd St
284	89	San Fernando St & Autumn St	18	96	San Fernando St & 4 th St
931	90	San Fernando St & Delmas Ave	49	97	San Fernando St & 7 th St
263	91	San Fernando St & Almaden Blvd	887	98	San Fernando St & 9 th St
11	92	San Fernando St & Market St	77	99	San Fernando St & 10 th St
3	93	San Fernando St & 1 st St	212	100	San Fernando St & 11 th St
7	94	San Fernando St & 2 nd St			

*Joint owned by City of Santa Clara

** Joint owned by Caltrans

***Joint owned by County

2 REQUIREMENTS

The requirements shown in Appendix A are divided into categories and subcategories as defined below. The requirements are listed as required or desired and reflect the needs and objectives determined by City stakeholders.

- 2.1 Signal Performance Measures: Requirements for the signal performance measures (SPM) to be provided by the ATSPM system

- 2.1.1 General SPM Requirements
- 2.1.2 Reports Requirements
- 2.1.3 Alerts/Alarms Requirements
- 2.1.4 Mapping Requirements
- 2.2 System Support and Management: Requirements involving basic data exchange and architecture of the ATSPM system
 - 2.2.1 General Access Requirements
 - 2.2.2 General Data Requirements
 - 2.2.3 Vendor Support Requirements
 - 2.2.4 Security Requirements
- 2.3 To provide traceability, each requirement includes a reference to associated user needs and key performance measures. The full list of user needs and key performance measures are included in Tables 2-4.
 - 2.3.1 Table 2 identifies the user need categories and abbreviations.
 - 2.3.2 Table 3 provides the complete list of user needs and reference numbers.
 - 2.3.3 Table 4 identifies the key ATSPM system performance measures and whether they are required or desired.

Table 2. User Need Categories and Abbreviations

Category	Abbreviation	Description
Operations	NOP	User needs related to the operations of the traffic signal
Planning	NPL	User needs related to collecting and tracking data and trends
Reporting and Documenting	NRD	User needs related to the performance measures reports
Network and Access	NNA	User needs related to the system network and access
Maintenance	NMT	User needs related to system maintenance and support
Other	NOT	User needs not included in the other categories

Table 3. ATSPM System User Needs

Number	User Need
NOP-1	The user needs to know when a phase is not long enough to serve the demand on a consistent basis (i.e., phase failure).
NOP-2	The user needs to know when a phase gaps out, maxes out or is forced off.
NOP-3	The user needs to know where there are high delays on specific approaches.
NOP-4	The user needs to know how efficient the progression is along a corridor.
NOP-5	The user needs to know how emergency preemption impacts the nearby traffic signals.
NOP-6	The user needs to know when large queues form or how long they are at specific locations.
NOP-7	The user needs to know when each coordinated timing plan was active
NOP-8	The user needs to know when and how often a traffic signal is in transition.
NOP-9	The user needs to know the length of each phase and cycle.
NOP-10	The user needs to know when the pedestrian push buttons are activated

Number	User Need
NOP-11	The user needs to know when communications to the traffic signals fail.
NOP-12	The user needs to know when the intersections go into Flash mode.
NOP-13	The user needs to know when the travel time is outside of the norm.
NOP-14	The user needs to know where, when and for how long TSP is activated.
NOP-15	The user needs to know when vehicles enter the intersection on a red light.
NPL-1	The user needs to collect, report and track vehicle volume data.
NPL-2	The user needs to collect, report and track bicycle volume data.
NPL-3	The user needs to collect, report and track pedestrian volume data.
NPL-4	The user needs to collect, report and track vehicle travel time data.
NPL-5	The user needs to collect, report and track vehicle delay data.
NPL-6	The user needs to collect, report and track number of transit priority requests.
NRD-1	The user needs to retrieve data from the local controllers (not external “black box”) and create the performance measure reports.
NRD-2	The user needs reports that are customizable by timeframe and data interval.
NRD-3	The user needs to produce both automated reports and reports based on a specific query.
NRD-4	The user needs to access near real-time logs (within 15 minutes) to produce reports.
NRD-5	The user needs to produce reports that are high level summaries for decision makers and detailed for use in operations and troubleshooting.
NRD-6	The user needs to store the logs, alarms, and reports for a set amount of time where they are easily accessible.
NRD-7	The user needs to produce performance measures based on the Purdue Data Set and show them graphically.
NRD-8	The user needs a dashboard that is configurable for each user and each of the performance measures he/she wishes to see.
NRD-9	The system needs to send alerts based on user defined triggers (using high-resolution data)
NRD-10	The system needs to produce report that compares current operations to past performance at same intersection.
NNA-1	The user needs to access the system from the City network and remotely via VPN.
NNA-2	The system needs to fully function between network security devices (i.e., fire walls).
NNA-3	The user needs access to full resolution data for a period of three years (fully query able). After three years, data may be compressed and archived to be stored indefinitely.
NNA-4	The user needs to receive alerts based on triggers via email or texts.
NNA-5	The user needs to collect data and produce reports on any City signal connected to the system.
NNA-6	Multiple users need to access the system at the same time.
NNA-7	The system needs to provide ad-hoc reports and query results within a reasonable delay of no more than 5 seconds from the time the request is made.
NMT-1	The user needs vendor support for training and maintenance
NMT-2	The user needs user manuals for system set-up, configuration, operations and maintenance.
NMT-3	The user needs on-call support for maintenance and troubleshooting issues
NMT-4	The user needs to be notified of software revisions when they become available

Number	User Need
NMT-5	The user needs to know when detectors fail
NOT-1	The system needs to be compatible with Model 2070 controllers operating D4 firmware
NOT-2	The system needs to be compatible with Model 2070 controllers operating Kadence adaptive signal system
NOT-3	The system needs to be compatible and operate in parallel with the TransCore TCS and Kimley-Horn KITS ATMS systems.
NOT-4	If the system fails, the existing central traffic signal systems and local controllers shall not be negatively impacted.
NOT-5	The system needs to make recommendations for signal timing parameter changes based on thresholds set by the user or internally determined by the system.

Table 4. Key ATSPM System Performance Measures

Category	Performance Measure	Required	Desired
Intersection Performance	Split Monitor	x	
	Purdue Phase Termination	x	
	Purdue Split Failure	x	
	Detector Health		x
	Yellow and Red Actuations	x	
	Queue Length/Delay		x
	Coordination Mode Status		x
Corridor Performance	Speed		x
	Arrivals on Green (Purdue Coordination Diagram)	x	
	Arrivals on Red	x	
	Travel Time		x
	Travel Time Index		x
	Planning Time Index		x
Multimodal	Pedestrian delay	x	
Preemption	Number of Preemptions	x	
	Length of Preemptions (time)		x
Planning	Vehicle Approach Volume	x	
	Vehicle Turn Movement Counts		x
	Bicycle Volume		x
	Pedestrian Volume		x
	Peak Spreading (Vehicle Hours of Delay)		x
Other	Vehicle Miles Traveled (VMT)		x

	Required	Desired	User Need Trace
"Performance Measures for Traffic Signal Systems, An Outcome-Oriented Approach" 2014	X		Multiple
enumerations from the Model 2070 controllers operating D4 software	X		Multiple
enumerations from the Model 2070 controllers operating Kadence adaptive signal system	X		Multiple
metrics for locations equipped with detection as listed below:		X	NOP-3, NPL-5
events per approach	X	X	NRD-7, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NOP-4, NRD-7, NPL-1, NPL-4, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NRD-7, NOP-4
events per approach (on diagram)	X	X	NRD-7, NOP-4, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NRD-7, NPL-2, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NRD-7, NOP-3, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NRD-7, NOP-4
events per approach on yellow indication per approach	X	X	NRD-7, NPL-3, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NRD-7, NOP-5, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NRD-7, NOP-5, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NRD-7, NOP-15
events per approach on red indication per approach	X	X	NRD-7, NOP-15
events per approach (on diagram)	X	X	NRD-7, NOP-1, NOP-9, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NRD-7, NOP-2, NOP-10, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NRD-7, NOP-2, NOP-10, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NRD-7, NOP-1, NOP-6, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NOP-5, NOP-7, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NOP-14, NPL-6
events per approach (on diagram)	X	X	NOP-6, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NOP-4, NRD-7, NPL-1, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NOP-4, NRD-7, NPL-1, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NOP-1, NOP-4, NOP-6, NRD-7, NPL-1, NPL-5, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NPL-3, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NPL-4, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NRD-7, NOP-4, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NRD-7, NOP-4, Table 4 Key Performance Measures
events per approach on red indication per approach	X	X	NRD-7, NOP-4, Table 4 Key Performance Measures
events per approach (on diagram)	X	X	NRD-7, NOP-4, Table 4 Key Performance Measures
events per approach on yellow indication per approach	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on red indication per approach	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach (on diagram)	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on yellow indication per approach	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on red indication per approach	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach (on diagram)	X	X	NRD-2, NRD-5, NRD-7, NNA-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on yellow indication per approach	X	X	NRD-4, NRD-5, NNA-7, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on red indication per approach	X	X	NRD-5, NRD-10, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach (on diagram)	X	X	NRD-2, NRD-5, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on yellow indication per approach	X	X	NRD-2, NRD-5, NRD-10, NRD-5, NRD-10, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on red indication per approach	X	X	NRD-2, NRD-5, NRD-10, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach (on diagram)	X	X	NRD-2, NRD-10, NPL-1, NPL-2, NPL-3, NPL-5, NPL-6
events per approach on yellow indication per approach	X	X	NOP-4, NRD-5
events per approach on red indication per approach	X	X	NOP-4, NRD-5
events per approach (on diagram)	X	X	NOP-4, NRD-5
events per approach on yellow indication per approach	X	X	NOP-3, NRD-5, NPL-5
events per approach on red indication per approach	X	X	NOP-3, NRD-5, NPL-5
events per approach (on diagram)	X	X	NOP-3, NRD-5, NPL-5

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td data and produce reports on any City signal connected to the system.			21
ccess the system at the same time.			29, 30, 32, 35
vide ad-hoc reports and query results within a reasonable delay of no more than 5 seconds from the time the request is made.			31
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like recommendations for signal timing parameter changes based on thresholds set by the user or internally determined by the system.			33, 34
			15, 16

SECOND REVISED EXHIBIT A-1.7 VERIFICATION PLAN

1 SCOPE

1.1 Document Purpose and Scope

The purpose of this document is to identify the verification activity needed to validate a new Automated Traffic Signal Performance Measures (ATSPM) for the City and ensure that the system meets the identified system requirements.

1.2 Project Purpose and Scope

1.2.1 The purpose of the project is to deploy operational tools that will enable the City to make informed decisions about operational strategies to improve their traffic signals and the operations of the project corridors, as well as provide the City with necessary data to conduct post-performance monitoring. The tools that will be deployed as part of this project include an ATSPM system, as well as any vehicle and/or pedestrian detection necessary for each performance measure.

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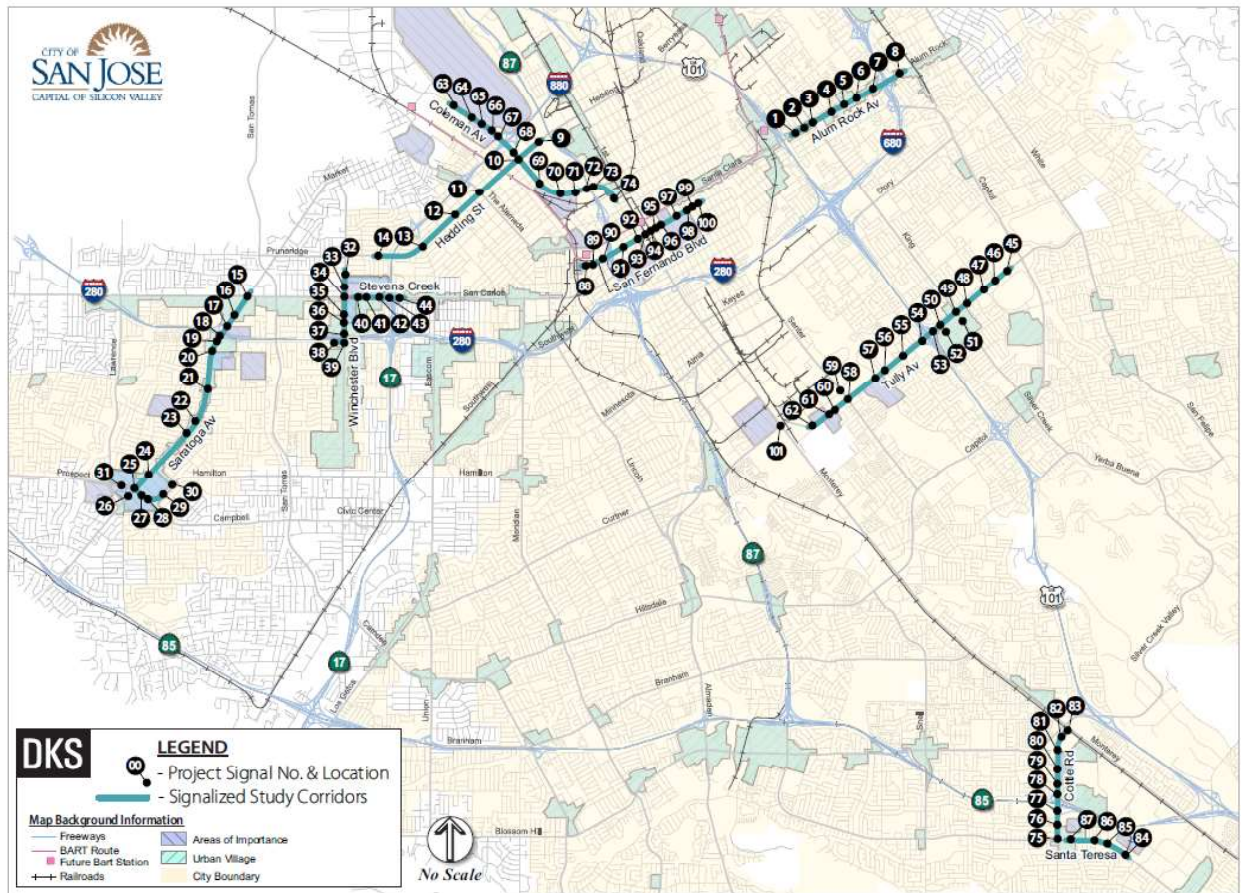


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Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
1041	1	Alum Rock Ave & 33rd St	1046	5	Alum Rock Ave & Sunset Ave
1053	2	Alum Rock Ave & 34th St	1047	6	Alum Rock Ave & José Figueres Ave
1044	3	Alum Rock Ave & King Rd	1048	7	Alum Rock Ave & Jackson Ave
1045	4	Alum Rock Ave & McCreery Ave	1051	8	Alum Rock Ave & Alexander Ave
Hedding Street					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
254	9	Hedding St & Ruff Dr	128	12	Hedding St & Park Ave
131	10	Hedding St & Coleman Ave	63	13	Hedding St & Bascom Ave
156	11	Hedding St & The Alameda	178	14	Hedding St & Monroe St

Saratoga Avenue					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
176	15	Saratoga Ave & Stevens Cr Blvd*	278	24	Saratoga Ave & Graves Ave
204	16	Saratoga Ave & Kiely Blvd	133	25	Saratoga Ave & Prospect Rd
264	17	Saratoga Ave & I-280 NB Ramp**	733	26	Saratoga Ave & El Paseo de Saratoga
199	18	Saratoga Ave & I-280 SB Ramp**	345	27	Campbell Ave & Westgate
190	19	Saratoga Ave Moorpark Ave	344	28	Campbell Ave & Hamilton Ave
389	20	Saratoga Ave & Blackford Ave	827	29	Hamilton Ave & Sagemont Ave
180	21	Saratoga Ave & Williams Rd	817	30	Hamilton Ave & Atherton Ave
194	22	Saratoga Ave & Doyle Rd	575	31	Prospect Rd & Westgate West
283	23	Saratoga Ave & Payne Ave			
Winchester Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
584	32	Winchester Blvd & Forest Ave	253	36	Winchester Blvd & Olsen Dr
583	33	Winchester Blvd & Dorcich St	198	37	Junipero Serra Fr & Tisch Way**
81	34	Winchester Blvd & Stevens Cr Blvd	126	38	Winchester Blvd & Moorpark Ave
304	35	Winchester Blvd & Olin St	197	39	Moorpark Ave & I-280 SB Off Ramp
Stevens Creek Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
177	40	Stevens Creek Blvd & Santana Row*	540	43	Stevens Creek Blvd & I-880 (W) Off Ramp*
537	41	Stevens Creek Blvd & Valley Fair	1013	44	Stevens Creek Blvd & I-880 (E) Off Ramp
72	42	Stevens Creek Blvd & Monroe St			
Tully Road					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
295	45	Tully Rd & Eastridge Ln	1076	54	Tully Rd & US 101 SB Ramp

294	46	Tully Rd & Eastridge Wy	200	55	Tully Rd & McLaughlin Ave
293	47	Tully Rd & Quimby Rd	404	56	Tully Rd & Lucretia Ave
628	48	Tully Rd & Huran Dr	668	57	Tully Rd & Galveston Ave
292	49	Tully Rd & King Rd	202	58	Tully Rd & Senter Rd
334	50	Tully Rd & Lanai Ave	686	59	Senter Rd & Parrott St
702	51	King Rd & Burdette Dr	914	60	Tully Rd & Valley Health Ctr
870	52	Alvin Ave & Fontaine Rd	351	61	Tully Rd & 10th St
1075	53	Tully Rd & US 101 NB Ramp	273	62	Tully Rd & 7th St***
174	101	Monterey Rd & Curtner Ave			
Coleman Avenue					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
154	63	Coleman Ave & Aviation Dr	144	69	Coleman Ave & Taylor St
1068	64	Coleman Ave & Earthquakes Wy	971	70	Coleman Ave & San José Mkt Driveway
934	65	Coleman Ave & Newhall Dr	970	71	Coleman Ave & Autumn St
258	66	Coleman Ave & Airport Blvd	586	72	Coleman Ave & Santa Teresa St
425	67	Coleman Ave & I-880 SB Ramp	963	73	Coleman Ave & Guadalupe Pkwy**
962	68	Coleman Ave & McKendrie St	23	74	Coleman Ave & Julian St
Cottle Road					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
343	75	Cottle Rd & Santa Teresa Blvd	1061	80	Cottle Rd & Coronado Ave
449	76	Cottle Rd & Hospital Pkwy	192	81	Cottle Rd & Poughkeepsie Rd
636	77	Cottle Rd & West Valley Freeway N Ramp**	237	82	Cottle Rd & Concord Dr
637	78	Cottle Rd & West Valley Freeway S Ramp**	1032	83	Cottle Rd & Endicott Blvd
499	79	Cottle Rd & Beswick Dr			
Santa Teresa Boulevard					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
615	84	Santa Teresa Blvd & Park Ride	812	86	Santa Teresa Blvd & Encinal Dr

431	85	Santa Teresa Blvd & Miyuki Dr	437	87	Santa Teresa Blvd & Camino Verde Dr
San Fernando Street					
Shop No.	Proj. No.	Intersection	Shop No.	Proj. No.	Intersection
85	88	San Fernando St & Montgomery St	40	95	San Fernando St & 3rd St
284	89	San Fernando St & Autumn St	18	96	San Fernando St & 4th St
931	90	San Fernando St & Delmas Ave	49	97	San Fernando St & 7th St
263	91	San Fernando St & Almaden Blvd	887	98	San Fernando St & 9th St
11	92	San Fernando St & Market St	77	99	San Fernando St & 10th St
3	93	San Fernando St & 1st St	212	100	San Fernando St & 11th St
7	94	San Fernando St & 2nd St			

*Joint owned by City of Santa Clara

** Joint owned by Caltrans

***Joint owned by County

2 REFERENCED DOCUMENTS

- 2.1 MTC IDEA Category 1 City of San José Automated Traffic Signal Performance Measures (ATSPM) Final Needs Assessment, DKS Associates, November 2018.
- 2.2 MTC IDEA Category 1 City of San José Automated Traffic Signal Performance Measures (ATSPM) Final Concept of Operations, DKS Associates, February 2019.
- 2.3 MTC IDEA Category 1 City of San José Automated Traffic Signal Performance Measures (ATSPM) Final System Requirements, DKS Associates, May 2019.
- 2.4 Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems, U.S. Department of Transportation, Federal Highway Administration, FHWA-HOP-11-027, August 2012.

3 CONDUCTING VERIFICATION

- 3.1 The verification of the ATSPM system will be conducted by the selected vendor, in the presence of the City staff, MTC staff, and the Systems Engineer. DKS Associates, the systems engineering consultant to MTC and the City for the IDEA grant project, shall provide the Systems Engineer services. Oversight of the verification process and system acceptance will be provided by the Systems Engineer.
- 3.2 The vendor shall submit verification procedures prior to conducting testing in accordance with the contract requirements. All mandatory requirements must be verified during testing. Any desired requirements that are included in the vendor's proposal must be tested and verified. The City shall witness all testing. Any acceptance must be agreed to by City staff. City staff may take recommendations on acceptance or failure of testing from MTC staff or the Systems Engineer.
- 3.3 The vendor shall provide all materials and equipment for testing. If City staff is required to provide any hardware, networking access, or other equipment deemed necessary, staff shall be

notified at a minimum of two weeks in advance of testing. The date and time of testing shall be coordinated so that all interested parties can attend.

- 3.4 All testing for the ATSPM system shall be conducted on a workstation at the City's Traffic Management Center (TMC) or San José City Hall and in the field. The intersections used for testing will be approved by City staff in advance of testing. When necessary, additional personnel may be required in the field to establish certain testing conditions, such as initiating communication or power failures or to form queues. Any failure scenarios must be conducted in a controlled environment under direction of City staff.
- 3.5 Bench testing will be conducted at the City of San José Traffic Management Center and/or San José City Hall Tower 8th floor. Locations and primary contacts are listed below:

Eric Lee, Associate Engineer
City of San José
200 E. Santa Clara Street Tower 8th Floor
San José, CA 95113

City of San José Traffic Management Center
55 N. 5th Street
San José, CA 95113

- 3.6 Additional verification testing will take place in the field for each project location with field-deployed hardware and software. The verification table (Appendix A) indicates where the test should be conducted. Testing will involve the following equipment:
 - 3.6.1 McCain Model 2070 traffic signal controllers operating D4 software and Kadence adaptive signal system software (in field and in a testing environment)
 - 3.6.2 Computers within the Traffic Management Center and City Hall
- 3.7 The vendor shall document the results of the system verification testing using the testing requirements provided in Appendix A. In the event that a requirement is not able to be tested successfully, the vendor shall document the failure, the cause (if known), and the procedures necessary to repair the failure. Depending on the cause or nature of the failure, and under the direction of City staff, either a portion of the test procedures or the entire test plan will be conducted again when the failure is remedied. The extent of retesting will be determined by City staff in consultation with MTC and the Systems Engineer. Final documentation of the failures, the resolution, and the results of the retest are required.
- 3.8 A 30-day burn-in period is required for all hardware and software prior to conducting the verification tests to ensure that data collection, analysis, storage, and retrieval are all performing as expected.
- 3.9 A record shall be maintained of each verification test, the outcome of the verification recorded, and the record signed by the vendor and City staff.
- 3.10 The outcome of each verification test shall be recorded as one of the following:
 - 3.10.1 Meets Requirements
 - 3.10.2 Partially Meets Requirements, with a statement of acceptable supplementary testing
 - 3.10.3 Does Not Meet Requirements

4 VERIFICATION IDENTIFICATION

- 4.1 This section identifies specific verification cases to be performed. A verification case is a logical grouping of functions and performance criteria that are to be verified together. Each case should contain the following:
 - 4.1.1 Test name and reference number
 - 4.1.2 Requirements to be verified
 - 4.1.3 Test circumstances – identification of necessary hardware, software, and intersection(s)
 - 4.1.4 Test script – steps required to conduct the test
 - 4.1.5 Pass/Fail criteria – data to be recorded or noted during verification, such as expected results
 - 4.1.6 Comments on how requirements are met, and proposed action if only partially met or not met
 - 4.1.7 Observing party sign off
- 4.2 The following test cases have been identified to correspond with the primary verification methods as outlined in the verification and test case matrix in Appendix A. The detailed test scripts, circumstances, and instructions shall be developed by the ATSPM vendor based on the matrix. The test procedures for acceptance testing will be submitted in accordance with the schedule provided by the vendor during procurement and must be consistent with this Verification Plan.
 - 4.2.1 Test Case 1: Product submittal review

The ATSPM vendor shall submit product specifications, cut sheets, and/or engineering drawings to the City for requirements verification and acceptance.
 - 4.2.2 Test Case 2: Product demonstration

The ATSPM vendor shall develop detailed testing scripts to demonstrate the identified system requirements. After the vendor has installed and deployed the system, a series of detailed demonstration tests will be conducted utilizing City traffic signal data. City staff will observe the demonstration.
 - 4.2.3 Test Case 3: Field observations

The ATSPM vendor shall conduct a visual inspection of system performance and/or functionality in the field. This visual confirmation will document how the system satisfies requirements associated with field-observed operations and/or functions.
 - 4.2.4 Test Case 4: Contract documentation

The ATSPM vendor shall execute contract documentation that addresses the identified requirements.

Product Development	Test Case 3: Field observations		Required (R) / Desired (D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	D
	Test Case 4: Contract documentation									
	Test Case	Verification Method								
<p>System will include a bicycle series. The series will allow the user to toggle the series on and off (as well as the other series). The bicycle series will be displayed with a unique color to distinguish it from other vehicles. (Added this CO#2)</p>	D	2	Demonstration of software	Bench	Met					
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
<p>Indicator, the detector configuration will allow a user to select as bicycle type. (Added this CO#2)</p> <p>Column options for bicycle arrival on Green and Red this CO#2)</p> <p>in the following formats:</p> <p>Historical reports.</p> <p>Reports based on cycle by cycle data</p> <p>Reports based on user-defined queries for performance</p> <p>Reports that compare current data to historical data for time periods</p> <p>Average arrivals on green per intersection in network</p> <p>Corridor average arrivals on green</p> <p>Average arrivals on red per intersection in network</p> <p>Corridor average arrivals on red</p> <p>Average delay per intersection.</p> <p>Split failure count per intersection in network</p> <p>Automated reports for user-defined measures</p> <p>Automated reports for user-defined time period</p> <p>Changes to intersection phase split times based on</p> <p>Changes to intersection offsets based on operational</p> <p>Point-to-point travel time calculations (within 15 minutes) actions equipped with necessary detection</p>			N/A							
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
<p>Changes to intersection phase split times based on</p> <p>Changes to intersection offsets based on operational</p> <p>Point-to-point travel time calculations (within 15 minutes) actions equipped with necessary detection</p>	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	R	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						
	D	2	Demonstration of software	Bench						

SECOND REVISED EXHIBIT B COMPENSATION

1 COMPENSATION AND PAYMENT TERMS

- 1.1 The maximum amount payable for all products and services provided under this Agreement shall not exceed **Two Hundred Fifty-Two Thousand Three Hundred Seventeen Dollars (\$252,317)** during the Initial Term. Any additional services requested by the City that would exceed the preceding maximum amount will be addressed in accordance with the Change Order Procedures. No additional services will be performed unless both Parties execute a Change Order outlining the services requested and the compensation agreed for such services.
- 1.2 Progress payments shall be made to Contractor by City based on net thirty (30) days payment terms, following delivery and acceptance of designated milestones as shown below in Table B1: Payment Schedule. All payments are based upon City's acceptance of Contractor's performance as evidenced by successful completion of all of the deliverables as set forth for each milestone. City shall have no obligation to pay unless Contractor has successfully completed and City has approved the milestone for which payment is due.
- 1.3 Payment for any deliverable under this Agreement, or inspection or testing thereof by City, shall not constitute acceptance or relieve Contractor of its obligations under this Agreement. City may inspect each deliverable and reject upon notification to Contractor any that do not conform to the specifications or other requirements of this Agreement. Rejected deliverables shall be promptly corrected, repaired, or replaced by Contractor. If City receives deliverables with defects or nonconformities not reasonably apparent on inspection, the City reserves the right to require prompt correction, repair, or replacement by Contractor in accordance with Contractor's warranty obligations.

2 PROJECT PERFORMANCE AND PAYMENT SCHEDULE

- 2.1 Work shall commence within two weeks of Agreement execution. All timeline dates are understood to be close of business, 5:00 pm Pacific Time. If timeline dates fall on a weekend or City holiday, the date is understood to be the next business day.
- 2.2 Compensation and payments shall be made to Contractor by City based on Net Thirty (30) days payment terms.
- 2.3 Implementation Invoicing Procedure: Contractor will invoice the City upon completion of each milestone but not more frequently than monthly.
- 2.4 Ongoing Annual Services Invoicing Procedure: Contractor shall invoice the City annually for applicable ongoing services including subscription, technical support, maintenance, and hosting fees at the end of the Warranty Period. City shall prepay a year in advance for applicable ongoing subscription, technical support, maintenance, and hosting services provided under the Agreement.
- 2.5 The City agrees to compensate Contractor for the Services performed and the Software and software customizations provided in accordance with the terms and conditions of this Agreement. Contractor shall invoice City in accordance with the Payment Schedule in Table B1 below:

Table B1: Payment Schedule

Milestone/Tasks	Deliverable(s)	Estimated Completion Date	Cost
Task 1: Project Management	Project Kickoff / Project Management / Project Implementation Plan. Completion of Deliverables Specified in Exhibit A-1, Sections Error! Reference source not found. and Error! Reference source not found.	June 1, 2021	\$29,602
Task 2: System Deployment	Requirements Gathering, Installation, Configuration, Integration, and Deployment. Completion of Deliverables Specified in Exhibit A-1, Sections Error! Reference source not found. , Error! Reference source not found. , and Error! Reference source not found.	March 30, 2021	115,202
Task 3: System Testing	Final Verification of the ATSPM System per the Final Verification Plan and Go-Live. Completion of Deliverables Specified in Exhibit A-1, Sections Error! Reference source not found. and Error! Reference source not found.	June 7, 2021	10,122
Task 4: Training	Training. Completion of Deliverables Specified in Exhibit A-1, Section Error! Reference source not found.	November 10, 2021	5,332
Task 5: System Documentation	System Documentation. Completion of Deliverables Specified in Exhibit A-1, Section Error! Reference source not found.	June 7, 2021	5,332
Task 6: Warranty	ATSPM System-related Software License(s)/Subscription(s) & Support & Maintenance (Years 1-3). Exhibit A-1, Section Error! Reference source not found.	June 7, 2024	71,177
Change Order #1	Add intersection of Monterey and Curtner to the ATSPM System	February 28, 2022	1,550
Change Order #2	Add bicycle metrics to the Mobility Signal Performance Measures (SPM) service	June 30, 2023	14,000
MAXIMUM COMPENSATION (INITIAL TERM)			\$252,317

Table B2: Price List

One-Time Implementation Costs	Initial Term (Years 1-3)	Option 1 (Year 4)	Option 2 (Year 5)	Option 3 (Year 6)	Option 4 (Year 7)	Option 5 (Year 8)	Option 6 (Year 9)	Option 7 (Year 10)	Total Not to Exceed
1. Project Management	\$29,602								
2. System Deployment	115,202								
3. System Testing	10,122								
4. Training	5,332								
5. System Documentation	5,332								
6. Warranty	71,177								
7. Change Order #1	1,550								
8. Change Order #2	14,000								
Subtotal Implementation	\$252,317								\$252,317
Ongoing Costs	Initial Term (Years 1-3)	Option 1 (Year 4)	Option 2 (Year 5)	Option 3 (Year 6)	Option 4 (Year 7)	Option 5 (Year 8)	Option 6 (Year 9)	Option 7 (Year 10)	Total Not to Exceed

9. Software License(s)/Subscription (s) - ATSPM Software, Including Integration With Controllers and Vehicle Detection Systems, APIs, FTP		\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$166,075
Subtotal - Ongoing Costs		\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$23,725	\$166,075
MAXIMUM COMPENSATION NOT TO EXCEED									\$418,392

All amounts stated above are in United States Currency.

*The signed Final Solution Acceptance Certificate (Exhibit A-3) triggers payment of the 20% retainer.

3 RENEWAL PERIOD COMPENSATION

- 3.1 After the Initial Term, the City reserves the right to extend the term of this Agreement pursuant to Section **Error! Reference source not found.** (“Options to Extend”) at the same rates as the Initial Term unless otherwise requested and agreed to in writing by the Parties.
- 3.2 Price Renegotiation. Contractor may request adjustments to compensation rates sixty (60) days prior to an option term. Contractor shall provide information justifying reasons for any increase, and City shall not unreasonably withhold approval of any increase provided the renewal quote for ongoing services does not increase by more than the Producer Price Index (PPI) final demand - WPUFD4 (<https://data.bls.gov/cgi-bin/surveymost?wp>) and does not exceed 3% over the previous year’s fees.
- 3.3 City shall provide Contractor prior written notice in the form of Exhibit E of its intention to exercise its option for the next term prior to the end of the then current term. The City’s Director of Finance or designee is authorized to exercise options on behalf of the City.

4 ADDITIONAL SERVICES

- 4.1 In the event the City requires additional services, Contractor shall provide a written quotation, at no cost to the City, of the type of Additional Service requested and the time required to complete the requested work.
- 4.2 Supplemental professional service rates shall not exceed the following:

Additional Services	Hourly Rate
Senior Advisor	\$185
Technical Lead	\$306
Senior ITS Engineer	\$245
ITS Engineer	\$153
Junior ITS Engineer	\$130

- 4.3 The City reserves the right to request a fixed priced quote in lieu of time and materials. Any fixed price quotes shall be consistent with or less than the agreed-upon additional service rates in Section 4.2 above and must be good for at least ninety (90) days.
- 4.4 Quotes must be approved by the City through an executed Change Order prior to any work being performed.

