

MEMORANDUM OF UNDERSTANDING between State of California and City Hesperia for Installation, Operation, and Maintenance of Adaptive Traffic Management System

I. INTRODUCTION:

This is a "Memorandum of Understanding" between the State of California, Department of Transportation (CALTRANS) and the City of Hesperia (CITY) covering installation, operation and maintenance responsibilities for the adaptive traffic system covering the northbound and southbound ramp at the intersection of Main Street with Interstate-15 in Hesperia. This document shall constitute solely a guide to the intentions and policies of the parties involved. It is not intended to authorize funding or project effort nor is it a legally binding contract.

II. PURPOSE AND BACKGROUND:

CITY desires to synchronize CITY traffic signals with adjacent CALTRANS traffic signals on Main Street. CITY received a Mobile Source Emission Reduction grant from the Mojave Desert Air Quality Management District. The CITY developed Capital Improvement Project No. 7133 Main Street Traffic Signal Synchronization – Phase II project to satisfy the requirements of the grant funding.

III. CITY OWNED EQUIPMENT INSTALLED IN STATE RIGHT OF WAY:

- I. In Sync Optimizer Unit: (In controller cabinet)
2. Ethernet-over-copper Extender (In controller cabinet)
3. Equipment panel with power supply, network switch, lightning suppressors, DIN relay (In controller cabinet)
4. Equipment cabling and pullboxes needed exclusively for CITY cabling
5. Type 15 poles, footings
6. Axis Video Cameras: (On pole(s) positioned for view of intersection approaches, as close as possible to controller cabinet.)
 - a. Cat5e Cable connecting cameras to processor
 - b. Keyboard (In controller cabinet)
 - c. LCD monitor (In controller cabinet)

7. CITY shall retain in perpetuity ownership over adaptive traffic management system which include the following components:

- Video cameras, mounting equipment, and video cable.
- Keyboard and LCD monitor.
- Equipment panel with power supply, network switch, lightning suppressors, DIN relay.
- Adaptive controller module.
- Communications equipment including Ethernet extender.

State owns right of way and all equipment, including all other items not enumerated above.

IV. TERMS OF MAINTENANCE:

1. CALTRANS will continue to maintain State-owned standard equipment located in the State's right of way which include but not limited to the following items: controller, controller cabinet assembly, signal and lighting poles, signal and lighting conductors and conduit, and pull boxes.
2. CALTRANS will disconnect or disable adaptive equipment and return the signal operation to pre-project connections and settings in the event of CITY's equipment malfunctions.
3. CALTRANS will make a reasonable effort to notify CITY within 48 hours regarding any changes to CITY system. City understands that workload and staffing factors may affect the actual amount of time prior to notification.
4. CITY will maintain adaptive and video system, and all associated cables and equipment.
5. CITY will only access with the State's controller cabinet with a CALTRANS' representative from either the Electrical Maintenance or Signal Operations group present. Contact information will be provided. CITY shall provide at least 48 hours' notice in advance of need to access cabinet.
6. CITY shall provide all replacement equipment, components, cables or parts for the adaptive or video system necessary for the proper operation of the adaptive system.
7. CITY shall maintain equipment on a regular and timely basis at in accordance with manufacturer's recommendations.
8. CITY shall clearly mark, label, and identify all equipment and cables associated with the adaptive and camera systems belonging to CITY.

9. CITY shall provide and maintain a laminated printed list in cabinet of steps for CALTRANS Maintenance personnel to take in event of incident or problems with CITY equipment, including how to disconnect/disable CITY equipment and CITY emergency maintenance contact information.

V. OPERATIONAL OVERVIEW

1. The system collects queue length data from the video detection and uses an optimization algorithm to prioritize vehicular and pedestrian service, while insuring minimum green bandwidth for the designated main street movements. The optimizer module then outputs a prioritized pair of phase calls to the controller. Other calls are withheld, and the controller services the only two calls it detects. All existing timing parameters remain unchanged except that the system cannot accept red and yellow call locks.
2. An Ethernet-over-copper extender mounted inside the cabinet connected to existing interconnect cable will provide communications to authorized users.
3. Because CITY's adaptive system operates using detection only, it can be easily disabled or disconnected and returned to free operation.

VI. TERMS OF INTERSECTION OPERATION:

1. MAINTAIN adaptive parameters and constraints as approved by CALTRANS District 8 traffic operations staff. CITY shall maintain adaptive system such that ramp queues and overpass queues are minimized. Priority settings shall be subject to review and approval by CALTRANS. Changes to settings, once approved by CALTRANS, shall not be made without CALTRANS' consent. In the event that the adaptive and/or camera systems exacerbate congestion and queuing conditions, CALTRANS will disconnect or disable the system and return the signal operation to pre-project connections and settings.
2. The adaptive system will be operational during a mutually agreed time of day schedule that best serves the interest of the public. Any modifications to the schedule will require CALTRANS' approval prior to implementation.
3. CITY equipment shall be installed and operated under observation of CALTRANS on a trial basis for a period of one year, referred to hereafter as TRIAL PERIOD.
4. Source of electricity for adaptive equipment shall be Caltrans controller power supply.
5. TRIAL PERIOD shall include field monitoring one month after the installation of the system during the peak and off peak periods when school is in or out of session. A subsequent review shall be performed for the session not covered during the initial review. A final review will occur one month prior to the conclusion of the TRIAL PERIOD. If system

performs to the satisfaction of both parties during TRIAL PERIOD, the terms of this Memorandum of Understanding shall be extended for a period of one year from the date of execution of this document. Unless formally terminated or revised by either party, this MEMORANDUM OF UNDERSTANDING shall be considered to be automatically renewed by a period of ONE YEAR at the end of each year following the date of execution.

6. CITY shall furnish supplemental system hardware and/or software upgrades, including custom programming as needed in order to substantially duplicate dilemma zone protection parameters as currently configured in the existing induction loop detector system.
7. Adaptive system shall be flexible to allow for phase sequence modifications, phase additions and phase deletions.

The following responsibilities have been identified and agreed upon by both parties:

VII. MUTUALLY AGREED:

1. CITY equipment and devices shall be reviewed and approved by CALTRANS prior to installation.
2. CITY will maintain a remote web-based access via virtual private network for CALTRANS District 8 traffic operations staff to remotely and locally turn off system in the event of malfunctions. This functionality will be provided without requiring any installation of any special software, and may be accessed through any web browser. There is no central server for this system. Each intersection has its own IP address with username and password protection. Any security features required by CALTRANS configurable under TCP/IP protocol shall be incorporated by CITY.
3. All network/computer security precautions/procedures shall be approved by CALTRANS. CITY shall not have access to modify CALTRANS signal timing AND CALTRANS shall not have access to modify CITY's signal timing.
4. CALTRANS shall not alter, adjust, modify, remove or replace CITY equipment without authorization from CITY.
5. CITY will maintain an inventory of at least ONE replacement unit for each adaptive system component for the four intersections to expedite repairs.
6. CITY shall not alter, adjust, modify, remove, replace, disconnect, activate or deactivate CALTRANS equipment without authorization from CALTRANS. CITY is not authorized to access the State's controller cabinet without a CALTRANS representative present.

7. CITY shall provide initial training for adaptive system with repeat training on an annual basis (if needed).
8. CITY shall provide up to 10 reference and training documentation manuals for CALTRANS maintenance and operations staff.
9. CALTRANS shall maintain the following controller timing setting restrictions (if available in Caltrans firmware) that are required for proper operation of the CITY adaptive system:
 - 1) All coordination plans shall be disabled.
 - 2) Controllers shall be set to operate in "free/uncoordinated" mode.
 - 3) Max Recall Inhibit (**MRI**) shall be enabled or turned on.
 - 4) Detector Diagnostic Failure Mode shall be set as follows:
 - a. Set On failure to 250 minutes
 - b. Set Off failure to 5 minutes
 - 5) All min green times should be set to 5 seconds. CITY will make provisions to accommodate longer min green times if requested by **CALTRANS**.
 - 6) All gap/passage times should be set to 1 second. CITY will make provisions to match operation of current detector settings if requested by **CALTRANS**.
 - 7) Yellow and red detector locking shall be disabled.
 - 8) All detector delays shall be removed. CITY will either maintain current delay settings, or modify as requested by **CALTRANS**. Delays can be applied through the adaptive system.
 - 9) All max and min recalls shall be disabled.
 - 10) All extensions shall be removed.
 - 11) Maximum green times should remain unchanged.
10. CALTRANS shall respond to all incidents. CALTRANS may, without prior notice, deactivate or disconnect CITY equipment remotely or locally at any time if problems appear that are suspected to be caused or exacerbated by CITY equipment. CALTRANS will make a reasonable effort to notify CITY within 48 hours regarding any changes to CITY system. City understands that workload and staffing factors may affect the actual amount of time prior to notification.
11. **CABINET DAMAGE:** CALTRANS shall provide emergency response and replace/restore all CALTRANS equipment to proper operation. CALTRANS will deactivate and disconnect and remove any damaged CITY equipment, if necessary. CALTRANS will make a reasonable effort to notify CITY within 48 hours regarding any damage to CITY system or failure of City system components. City understands that workload and staffing factors may

affect the actual amount of time prior to notification. CITY maintenance crews will provide service after CALTRANS maintenance/restoration operations and restore CITY equipment to proper working order.

12. EMERGENCY RESPONSES RESULTING FROM MALFUNCTIONING CITY

EQUIPMENT: An estimate of the percentage of responses attributable exclusively from CITY equipment will be derived from CALTRANS maintenance experience during the TRIAL PERIOD. CALTRANS shall document all expenses exclusively associated with maintaining signal system equipped with CITY equipment. From this, an estimate of the incremental maintenance cost increase associated with CITY equipment will be developed. CITY will make arrangements for payment with required CALTRANS departments. CITY will prepare and arrange for execution of agreement and fund transfer. Based on the maintenance cost information, CALTRANS and CITY may agree to any of the following options:

- a. CALTRANS and CITY agree on a lump sum fee for each emergency maintenance request that results exclusively from malfunction of CITY equipment.
- b. CALTRANS and CITY agree on a cost-based or hourly fee for each emergency maintenance request that results exclusively from malfunction of CITY equipment. CITY will make arrangements for payment with required CALTRANS departments.
- c. CALTRANS and CITY agree that CITY will respond to any emergency calls suspected of being associated with CITY equipment. CITY shall furnish CALTRANS with emergency response contact information.

13. CITY shall remove and relocate equipment upon request by CALTRANS request if necessary to accommodate construction or equipment replacement /upgrade.

14. If CALTRANS upgrades controllers or central system, CALTRANS will permit CITY opportunity to demonstrate compatibility between CITY adaptive system and new CALTRANS system. If compatibility can be demonstrated to CALTRANS' satisfaction, this Memorandum of Understanding may be considered to include any new CALTRANS equipment or replacement system deemed compatible.

IN WITNESS WHEREOF the parties have executed this Agreement on the dates indicated below, the latest of which shall be deemed the effective date of this Agreement.

State of California Department of Transportation

City of Hesperia

("CALTRANS")

("CITY")

, Branch Chief Date
Traffic Signal System Support
District 8

Nils Bentsen, City Manager, Date

APPROVED AS TO FORM:

Eric Dunn Date
City Attorney

Attested By:

Melinda Sayre Date
City Clerk