

**FINAL REPORT: MOBILE SURVEILLANCE AND  
WIRELESS COMMUNICATION SYSTEMS FIELD  
OPERATIONAL TEST VOLUME 3: APPENDICES  
A-J CONTAINING EVALUATION DATA  
GATHERED DURING THE ANAHEIM SPECIAL  
EVENT AND I-5 TEST**

**NOTE TO READER:**

**THIS IS A LARGE DOCUMENT**

Due to its large size, this document has been segmented into multiple files. All files separate from this main document file are accessible from links ([blue type](#)) in the [table of contents](#) or the body of the document.

**Final Report: Mobile Surveillance and  
Wireless Communication Systems Field  
Operational Test  
Volume 3: Appendices A-J Containing  
Evaluation Data Gathered During the Anaheim  
Special Event and I-5 Tests  
Lawrence A. Klein**

California PATH Research Report  
UCB-ITS-PRR-99-8



CALIFORNIA PATH PROGRAM  
INSTITUTE OF TRANSPORTATION STUDIES  
UNIVERSITY OF CALIFORNIA, BERKELEY

**Final Report: Mobile Surveillance and  
Wireless Communication Systems Field  
Operational Test  
Volume 3: Appendices A-J Containing  
Evaluation Data Gathered During the Anaheim  
Special Event and I-5 Tests  
Lawrence A. Klein**

**California PATH Research Report  
UCB-ITS-PRR-99-8**

This work was performed as part of the California PATH Program of the University of California, in cooperation with the State of California Business, Transportation, and Housing Agency, Department of Transportation; and the United States Department of Transportation, Federal Highway Administration.

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California. This report does not constitute a standard, specification, or regulation.

Report for RTA 65W404

March 1999

ISSN 10551425

**Final Report: Mobile Surveillance and Wireless  
Communication Systems Field Operational Test**

**Volume 3: Appendices A – J Containing Evaluation  
Data Gathered During the Anaheim  
Special Event and I-5 Tests**

**Prepared by:  
Lawrence A. Klein, Ph.D.**

**Prepared for:  
University of California at Irvine**

**January 1999**

## Preface

The Mobile Surveillance and Wireless Communication Systems Field Operational Test (FOT) contained two evaluation tests, the Anaheim Special Event Test and the Interstate-5 (I-5) Test. The Anaheim Special Event Test assessed the ability of the surveillance trailers to transmit video imagery to a traffic management center in support of arterial traffic signal control. This test occurred during the Spring of 1997 in conjunction with heavy traffic experienced during hockey playoff games at the Arrowhead Pond in Anaheim, CA. The I-5 Test evaluated the ability of the mobile surveillance and ramp meter trailers to transmit video imagery and data in support of freeway ramp metering. It occurred a year later in Spring 1998 along I-5 in Orange County, CA. The results of these tests and other conclusions from the FOT are presented in three volumes. The first volume serves as the Executive Summary of the FOT. It describes the project objectives, results, conclusions, and recommendations in condensed fashion. The second volume discusses the overall goals and objectives of the FOT and the design of the mobile surveillance and wireless communication system in more detail. Technical and institutional issues that surfaced before either of the two FOT tests was conducted are described. The specific objectives of the Anaheim Special Event and the I-5 Tests, lessons learned, test results, and recommendations are expanded upon in this volume. Photographs and drawings are used liberally to illustrate the types of equipment and test configurations that were tested. Volume 2 also incorporates revisions to the evaluation plans that were originally prepared by Pacific Polytechnic Institute (PPI). The evaluation plans and preliminary results from the planning and design phases of the FOT and the Anaheim Special Event Test were originally published by California Partners for Advanced Transit and Highways (PATH) under Report 97-C34. The third volume consists of ten appendices that contain data and other information gathered during the tests.

The test planning and execution were a cooperative effort among the partner agencies and companies. These were the Federal Highway Administration, California Department of Transportation divisions in Sacramento and Orange County, California Partners for Advanced Transit and Highways, University of California at Irvine Institute of Transportation Studies, California Highway Patrol, City of Anaheim Department of Public Works, Hughes Aircraft Company (now Raytheon Systems Company), Pacific Polytechnic Institute, and Lawrence A. Klein, Consultant.

This report was prepared in cooperation with the State of California, Business Transportation and Housing Agency, Department of Transportation. The material is based on work supported by the Federal Highway Administration, the State of California, Department of Transportation under prime contract number RTA-65A0012, and the Regents of the University of California.

The contents of the report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California, the Federal Highway Administration, or the Regents of the University of California. This report does not constitute a standard, specification, or regulation.

## Table of Contents

<b>PREFACE</b>	.....	<b>iii</b>
<b>APPENDIX A: WRITTEN STATEMENTS FROM MEMBERS OF PROJECT MANAGEMENT TEAM</b>	.....	<b>A-I</b>
<b>APPENDIX B: TRAILER SETUP AND MAINTENANCE PROCEDURES</b>	.....	<b>B-I</b>
<b>APPENDIX C: TRAILER TRANSPORT DATA SHEETS FOR ANAHEIM SPECIAL EVENT TEST</b>	.....	<b>C-I</b>
<b>APPENDIX D: CAMERA OPERABILITY DATA SHEETS FOR ANAHEIM SPECIAL EVENT TEST</b>	.....	<b>D-I</b>
<b>APPENDIX E: TRAILER TRANSPORT DATA SHEETS FOR I-5 TEST</b>	.....	<b>E-I</b>
<b>APPENDIX F: CAMERA OPERABILITY DATA SHEETS FOR I-5 TEST</b>	.....	<b>F-I</b>
<b>APPENDIX G: VIP BELIEVABILITY DATA SHEETS FOR I-5 TEST</b>	.....	<b>G-I</b>
<b>APPENDIX H: RAMP METER OPERABILITY DATA SHEETS FOR I-5 TEST</b>	.....	<b>H-I</b>
<b>APPENDIX I: SURVEILLANCE TRAILER LOGS</b>	.....	<b>I-I</b>
<b>APPENDIX J: QUANTITATIVE DATA USED TO EVALUATE SURVEILLANCE AND RAMP METER TRAILER PERFORMANCE ON THE I-5 FREEWAY</b>	.....	<b>J-1</b>

**Appendix A:**  
**Written Statements from Members of Project Management Team**

## **Mobile Surveillance and Wireless Communication Systems Field Operational Test Individual Evaluation**

**Nathaniel Behura  
City of Anaheim**

This report is being provided to assist PPI in examining the test data and procedure that will determine the viability of the Mobile Surveillance and Communication Filed Operational Test (FOT). I was involved as Project Manager for the City of Anaheim, one of the partners in the test, and was responsible for all liaison between the other test partners and Anaheim. I was ultimately responsible for all activities and support provided by Anaheim for this FOT.

My involvement began fairly late on the overall project schedule, at the stage when field tests were about to begin in Anaheim. I attended my first meeting regarding this project on February 20, 1997, at the Caitrans District 12 TMC. I had not had the benefit of knowing the details of the project or its goals as had my predecessors (Jim Paral, Chris Dahi, Yo Baba), and my role was concentrated on the implementation aspect of the project. Hence, my statements in this report are a combination of my first hand experience and any information I could gather from speaking to other participants or reviewing project files. My comments follow the format recommended in the report "Individual Evaluation Plan for Test #2 - City of Anaheim" prepared by PPI, and dated March 25, 1997.

### **Test Objective I- Examine Portability**

#### **Statement 1.1 - Site Selection**

Initial site selection was based on the usefulness of the Mobile Surveillance Trailers (MST's) in providing visual data to the TMC Event Operators in Anaheim. Though there are several large event generators in the City (Anaheim Stadium, Arrowhead Pond, Disneyland, Anaheim Convention Center) only the Stadium and the Pond had distinct evening events that could be distinguished from commuter traffic and required evening TMC traffic management. Of the two locations, only the Pond had various events regularly throughout the year. Hence, the Pond was our first choice for an event generator.

Ingress and egress traffic flow vary in various aspects, the most important of these being that egress traffic has a more pronounced peak and shorter duration. These aspects make it easier to measure any impacts of mitigation actions on event traffic. Of the various routes that egress traffic takes, Anaheim recommended three locations which are important intersections where it currently does not have cameras, and visual confirmation of field conditions at these locations would benefit the operators. These intersections, in order of their importance from a traffic management perspective are:

- 1.) Ball Road and Phoenix Club Drive
- 2.) Cerritos Avenue and Sunkist Stre
- 3.) State College Boulevard and Cerritos Avenue

To ensure that these sites are viable for traffic management, the City had to check for the following criteria.

- a.) The sites were actually available for tests, since these were on private property.
- b.) The sites had adequate space for parking the MST's
- c.) The sites allowed for proper vantage points or views to monitor the necessary traffic flowing in a specific direction.
- d.) The sites had adequate signal strength or line of sight to the relay station to receive the necessary signals and send video back.

Since the teams that carried out the above mentioned checks were not the same ones, the sites were not always selected with all these aspects in mind (8.g. when Signal strength checks were done, it was not checked to see whether the spot with the best strength had good camera perspectives).

The MST could not be located at Phoenix and Ball because there was not any space for parking. The MST was moved west, to the Ball Road and SR-57 on-ramp.

I had managed tasks a), b), and c), of this project after signal strength checks were completed already. initially, from an aerial map and from sit8 visits, we eliminated the corners of each intersection which would not meet criteria b) and c). I had identified and met with the property owners to ensure the sites were available for Upcoming event dates. Once the event dates were identified, I had prepared written agreements for property owners to sign and make their sites available for the FOT. It was imperative to convey both the importance of the tests to local traffic flow, and the appreciation of the test partners, to elicit cooperation. However it was most important to ensure the we created the least amount of intrusion in the owners' regular operation of these sites. It was also critical to inform the owners of the exact length of time the MST's would be on-site and of the precise locations.

Some of the problems in the field that were encountered were:

- I) Identifying and contacting the owners within a short time
- II) Getting permission to park the MSTs; concerns about hindering parking operation, duration of tests, and liability issues.
- III) Problem with swapping MST's - created more uncertainty about specifics that property owners like to know, and with availability of MST transportation personnel.
- IV) Blocked or poor camera view; since permission for space was acquired based on perceived camera views and signal strength. Set-ups had to be adjusted to improve camera view within the existing space confinements.
- V) Liability and theft problems. Though this was not a primary concern, it Was an issue With the owners for accidets and thefts that could occur on their property.

### **Test Objective 2-Trailers work for Traffic Management**

Though my statement in this category is not required, I would like to indicate that the forms required to be completed for this assessment are cumbersome to some extent in their current form, and that the operator found it difficult and somewhat unnecessary to check the camera every 15 minutes.

### **Test Objective 3 - Assess Additional Surveillance**

I provided the Data 3.1.1 on event duration, Please note that there is a significant variability in the “egress duration” based on the expertise of the individual operators, the actual field conditions (e.g. number of police on street, traffic signals under repair, TMC equipment or camera under repair, Caltrans Freeway CMS Status, etc.), and the accuracy Of the recorded times. Operators often take preemptive action to accommodate for traffic at these blind intersections in absence of cameras. Given this variability, the actual improvement with camera may be difficult measure.

For Data 3.1.2, the only known problem was that Trailer 11 at Ball and SR-57 ramps was not working.

Please contact me to record the attendance data for March events.

### **Test Objective 4- Resource Sharing Institutional Issues**

#### **Data 4.1.1 - Advantages of Resource Sharing**

The following are a list of advantages that I perceive from such resource sharing:

1. Ability to monitor currently blind intersections.
2. Creates a framework for interagency cooperation.
3. Ability to us8 MST in future for intersections under construction (upcoming i-6).
4. Better understanding of the usefulness of camera at certain location for events (i.e. do we really need cameras here?)
5. Provides ideas for future projects.
6. Provides insight Into viability of new technology.

#### **Data 4.2.1 - Disadvantages of Resource Sharing**

The following are a list of disadvantages that I perceive from such resource sharing:

1. Interagency coordination is not smooth; various opinions and perspective of partners.
2. City cannot assume more liability to test new equipment.
3. There is some training involved for City Personnel.
4. The City has to arrange with the Police to monitor security at MST locations,

5. Permission required from private property owners.
6. Significant time and resource commitments are necessary from Anaheim which has limited manpower availability. The benefits may not be commensurate. Availability issues made it necessary to work in narrow windows of time, which was not always responded to by other participants.
7. Long time frame of project necessitated changes in Project Managers, which was detrimental to smooth and timely completion of project.

#### **Data 4.2.1 - Cost of Resource Sharing**

The following are a list of costs that may have been incurred from this resource sharing, by the City:

1. Participation Costs: This is our major item since our manpower is so limited. Such costs include direct manpower costs (by hours) for project managers, operators (training and meetings), field technicians, maintenance personnel, etc.
2. Indirect costs include the opportunity costs for all other projects and tasks that were postponed or cancelled to attend to this project with a short deadline.
3. Equipment costs for TMC installation.
4. Exposure to liability.

#### **Test Objective 6 - Information Sharing: Institutional Issues**

##### **Data 6.1.1 - Advantages of Video Sharing**

The following are a list of advantages that I perceive from such resource sharing:

1. Allows Caltrans to manage ramp operation in the vicinity of Arrowhead Pond (relevant to one location only.)
2. Creates a framework for interagency information sharing and cooperation.
3. Provides better understanding of each others operation.

##### **Data 6.2.1 - Disadvantages of Video Sharing**

The following are a list of disadvantages that 1 perceive from such resource sharing:

1. Video sharing requires prioritizing control, hence limits primary control for one agency.
2. Technical problems sometimes have precluded one agency from sharing controls.

### Other Considerations:

There are a few other issues that need to be addressed that affect the success of this FOT. These issues may fall into one or more categories discussed before, I leave it to PPI to make such classifications, or determine if these issues are important enough to be discussed.

1. PMT Partners Buy-in and Support Currently projects such as this are based on initial agreements and discussions between some representatives of the participating agencies. However, some essential participants may not have been properly informed about the benefits of the project. It is necessary to get a thorough buy-in of the project from the participating agencies as this commitment may wear thin as time passes and the schedule is stretched. To correct this situation, management or senior level personnel should be fully committed at the beginning of the project and should have a full understanding of what resources and time commitments are necessary, and if and how the project is beneficial to the agency or to the community in general.
2. Paperwork Requirements from Participants: Many of the key people helping with the project are not used to writing statements or doing paperwork. This may seem trivial for a research organization, however, can pose difficult situations for some technical personnel. One suggestion would be to create a form with specific questions that may be helpful in getting the same information. The paperwork responsibility should be assumed by entities who are better equipped to handle it.
3. Time Coordination: It is important to understand that key agencies who are small will have a shortage of resources, including personnel and time. Hence, when a time window is given by such an agency for another participant to be present or perform a task, it needs to be formed to. If a time window is missed, it is difficult for the small agency to reschedule such a task.
4. Fuel Issues: Fuel depletion was an unforeseen circumstance, and affected proper equipment checking as the MST's had to be put on "manual" mode. It was also an issue of manpower availability to refuel the MST's. This aspect needs to be preplanned.

Please contact me at (714) 254-5183 to discuss any of these and other related issues. An appointment is recommended.

4-15-97

TO: NATHAN BETHUNA

RE: MOBILE SURVEILLANCE COMMENTS

THE THREE DAYS THAT I WAS INVOLVED, I FOUND THE UNITS VERY USEFUL. THOUGH THE COMPLETE VERSION OF USE WAS NOT AVAILABLE NOR WAS IT TO BE TESTED AT THIS TIME, THEY WERE STILL VERY USEFUL FOR VISION PURPOSES ONLY.

THE ONLY PROBLEM ENCOUNTERED WAS THE ABILITY TO MOVE THESE TRAILERS AROUND FLUIDLY. I'M SURE WE LEARNED A GREAT DEAL AND AS WE USE THESE IN THE FUTURE, THE SYSTEM WILL IMPROVE.

Larry Fitzgerald  
(714) 254-6914

**Statement about FOT #2, Event 1 on Tuesday, April 1, 1997**  
**Tadeo Lau, District 12**

Notice of deployment was given to Maintenance approximately ten days prior to the deployment (Mar 26) of the trailers. Ed Hepko was briefed by Tadeo Lau about the sequence and dates of events and deployment to take place. His supervisor in turn compiled a list to present to his superintendent. Tadeo Lau met with the superintendent on Mar. 21 and went over the plan Maintenance was going to undertake to accommodate the test.

New database records and icons in the ATMS system for the trailers in Anaheim were created but not activated at Caltrans TMC prior to the deployment.

On Mar. 25, one day before the first trailer deployment, all three trailers were refilled with propane. I field checked all the three sites in Anaheim for the last time for space and building/tree blockage and identify the exact spots to park the trailers. I requested Lany Hazuka of Anaheim to place cones around two to three parking spaces at Sunkist/Cerritos either on the evening before or on the morning of deployment. Larry indicated that it was not necessary to cone off the area as plenty of parking space should be available at time of deployment. Ed Hepko confirmed that besides two maintenance persons to participate in the deployment on the first day of deployment, other personnel from his crew would also be available to assist in the ramp closure that was necessary at Ball/57. No provision of concrete blocks or sand bags was required for this test.

Prior to the deployment on Mar. 26, the new ATMS icons for the trailers were activated and the old ones were deactivated. When picking up trailer 111, the antenna and cameras were oriented to ensure safe mast-retraction. Trailer 111 was transported from I-S/Culver to Rte. 57/Ball. Once the trailer arrived near the site, I talked to Ed Hepko to coordinate how trailer would be backed up into the designated area. Brian Tankersley participated in the setup on the first day of deployment. Maintenance had two additional trucks and three additional crew members to facilitate the ramp closure. The closure started at around 9AM at the freeway on ramp. Once the trailer was backed up into the pull-out area, the ramp was re-open and the crew that assisted in the ramp closure left the site. Signal was checked and cameras were oriented while trailer was still hitched. However, the remote operability was not verified at this point because Maintenance crew wanted to finish hauling the second trailer. One of the four stabilizers could not be lowered.

Trailer 113 was transported from I-5/1st Street to Sunkist/Cerritos. After radio link was established, Anaheim TMC was asked to remotely activate the trailer. Larry Hazuka participated as observer for the setup only. Although Anaheim could control the cameras, it did not receive video. This was later fixed by Brian at Anaheim TMC. Caltrans TMC was asked to test the same but the trailer did not start up at all. Additional steps had to be performed by Caltrans in setting up the camera control processes.

I briefed two Caltrans shift leaders in the morning during the deployment as to the situation regarding the deployment of the three trailers. It was then followed by a memo in the afternoon describing the operation protocol between the two TMC's, and reporting of any urgent alarm to the Anaheim PD.. A trailer location map was also attached for their reference.

Two maintenance electricians participated in the transportation of trailer 115 from I-5/Main Place to State College/Cerritos on Mar. 27. No cones were used to mark off area for trailer and it turned out that it was not necessary. The exact spot was selected to avoid tree blockage of radio link and to obtain the best field of view for cameras. L-any Hazuka assisted in the setup of the trailer today as part of hands-on training. The mast was raised and oriented to establish the radio link. I turned on Trailer 113 and Anaheim TMC was asked to test control of both trailers and switch cameras back and forth between trailers. All operations were confirmed Caltrans still did not have control of any trailers.

I visited Trailer 111 at Ball Road and requested Anaheim TMC to remotely turn on the trailer and tested for video. Operability and receive of video were confirmed. All trailers were then put in manual mode to conserve fuel as no agency would likely use any of the trailers over the weekend. Brian turned all trailers to auto mode in the afternoon of the event and had Anaheim checked their operability before the event started. In the morning after the event, I went to all three trailers and shut them down and put them in manual mode again.

**Statement about FOT#2, Event 2, on Friday April 4, 1997**  
**Tadeo Lau, District 12**

The day after Event 1, April 2, Trailers 113 and 115 locations were switched. Trailer 115 was first moved to the S/W corner across from Trailer 113. This turned out to have a better field of view for Anaheim. The mast was raised, signal was checked out, and Anaheim TMC was asked to test the trailer. After operation of 115 is confirmed Trailer 113 was moved from Sunkist/Cerritos to where Trailer 115 was once at. Although a user manual was not readily available at this time, Larry Hazuka assisted in the setup of the mast and requested Anaheim TMC to test the trailer and cameras.

The trailers were put into manual mode because there was concern about the reliability of the auto-gen-start circuit. The day after the event Brian and Tadeo visited the sites at different time to ensure the trailers generators were power down and put to manual mode.

The problem with using the ATMS icons to control the trailers during event 1 was solved. Again, the ATMS icons had to be moved on the map to reflect the changes in locations. TMC operators were notified of the trailer relocation,

Maintenance utilized two persons and a truck to swap the two trailers.

Hughes performed oil-change and checked water in batteries of all three trailer.

**Statement about FOT #3, Event 3 on Wednesday April 9, 1997**  
**Tadeo Lau, District 12**

Trailer 111 and 115 were scheduled to exchange locations on April 7. However it was Saturday April 5 when Brian realized the two parking lots were being 'e-paved. Without full knowledge of the availability of the parking lots on the morning of April 7, while the ramp closure team and all participants assembled at the on-ramp, the swapping operation was called off as Maintenance crew did not want to be held up for too long. I visited the property management and received a confirmation from them that the re-paving would be halted for two weeks and Anaheim could continue using the parking lots as agreed.

Icons for Trailer 111 and 115 were adjusted on the map.

The relocation of trailers 111 and 115 was scheduled again for April 8. Trailer 111 was towed to Sunkist/Cerritos and was dropped off temporarily at the S-E corner, while the crew went to pick up 115 from the S-W corner and transported it to Rte-57/Ball. The radio link was checked and Anaheim was called to confirm that. Trailer 111 was then moved from the S-E corner to the S-W corner. Again, the antenna was oriented, radio was checked and confirmed. All three trailers were put to manual mode to conserve fuel until the afternoon of the event.

Maintenance had a truck and two persons assisted in this swap

All three trailers were refueled on April 9.

Anaheim should have more resources in training its personnel to setup and move trailers in the future.

On April 9 afternoon while I went through the trailers to put them in auto mode, I noticed the antenna and all camera positions were shifted. Checking the radio signal confirmed that, and it appeared that the high wind that day might have changed the direction of the mast. Rick Anderson re-visited the three trailers and adjusted all antenna positions before Anaheim could receive video during the event.

On April 10, all three trailers were transported back to their original sites on the I-5. One Maintenance person was assigned this time because of difficulties in scheduling. Database information was modified to reflect the move back on to the I-5. All Anaheim icons were deactivated and the trailer icons are re-activated on the freeway.

Maintenance suggested that Caltrans should consider hiring contractors to transport trailers if possible. This may help to avoid difficulty in scheduling and affect their other responsibilities.

April 16, 1997

**Written Statement**  
for  
Mobile Surveillance and Wireless Communication FOT  
Anaheim Special Event Test No. 2  
(by Lawrence Emerson, Caltrans New Technology and Research)

My comments will follow the Order of the six objectives and the measures listed in the Evaluation Plan.

Objective 1 - Ease of Movement and Setup

**Pre-transport Preparations**

- **Site Selection** - The intersections pick by Anaheim were to help with the “dark spots” around the pond. Nathan Behura can comment on coordination and getting permission from property owners. Caltrans provided a letter indicating that Anaheim would not have any major liability for possible damage to trailer as long as reasonable care was taken. It was probably easier for Anaheim to then get permission from property owners.
- **Site Survey** - Consideration of exact location of the trailers to optimize viewing of traffic and avoid trees was not done until actual deployment. This was done mainly by Caltrans initially. I believe some input on better location was made by Anaheim TMC staff after using trailers and becoming more familiar with them. Earlier in 1996, Caltrans and Hughes staff took a bucket truck to Anaheim’s proposed three locations to check line-of-sight and radio signal strength. On proposed location at Phoenix and Ball Road did not have enough space to locate the trailer easily. Caltrans staff decided to test signal strength to the east near 57 within Caltrans tight-of- way. This location was found satisfactory for signal strength and could still look back to Phoenix Road.
- **Site Readiness** - The mainly involved having Anaheim staff cone of tape off the spots in the privately owned parking lots early in the morning or the night before to insure no cars were parked in the way. For the location at Ball Road in the Caltrans right-of-way, additional Caltrans vehicles were needed to provide temporary ramp closure while backing the trailer on to the spot from the freeway on ramp.
- **Trailer Readiness** - Caltrans staff pretty much knew what was needed to prepare and tow the trailers. The times I observed, however, they were using a truck that was much larger than necessary because a smaller one was not readily available.
- **ATMS Icon and Database Set Up at Caltrans TMC** - This was actually the first time that Caltrans staff (Tadeo Lau) need to set up the icons and database at the TMC for the trailers. The first time this was done by NET staff. So, there was a bit of a learning curve and the icons and database were not ready for the first event. Also, the ATMS had to be reset once the new locations were in place. This is something that were not aware of until it happened.

**Time to hitch, transport, set, make operational** Major difficulty was in positioning trailer in parking lots with the oversized truck. Use of a smaller truck in the future will allow greater ease of positioning trailers in tight spots. Training of Anaheim staff for field set up was a challenge because Hughes had not yet prepared a check off list of actions to perform, however, Anaheim staff did seem to pick up what was needed to be done when given the opportunity.

## Objective 2 - Suitability for viewing event traffic

Comments on this should mainly come from Anaheim, however, from the video tape that Anaheim made during the events it was easy to discern between cars and trucks and the general number of vehicles. There was a little glare from some headlights which were pointed in the direction of the cameras, however, this did not really cause a problem to see the flow of traffic.

## Objective 3 - Impact of Additional Video Surveillance

Comments on this should mainly come from Anaheim, however, the video tape of the traffic on Ball Road and the 57 Northbound Off Ramp made it fairly clear that the Caltrans signals at the off ramp and the City signals at Phoenix and Ball Road generally work well together and did not cause any significant back up of the outbound traffic from the pond. Anaheim staff (Curt) should be interviewed to determine if he made any adjustments to the signal to minimize any problem or if he just set it to maximize outbound traffic from the pond while at the same time allowing west bound flow on Bal Road to flow without backing up too long.

## Objective 4 - Institutional Issues, Benefits, and Cost associated with Resource Sharing (Pros/Cons)

### Advantages

- ✓ **Provides Surveillance to otherwise “dark” locations in Anaheim** - Yes
- ✓ **Facilitates inter-agency cooperation** - Yes, gave Caltrans TMS night shift chance to interact with local city and become more familiar with each other. Could view outbound activity from event going onto freeway. Allowed Caltrans TMS staff to become more aware of arterial roads which they do not normally view.
- ✓ **Opens the door and makes it easier for future cooperative efforts.**

### Disadvantages

- ✓ **Requires Complex Interagency coordination** - Yes, but with good staff and cooperation this was made easier. Could have been more difficult or impossible. Good Partnering for mutual benefits, hopefully.
- ✓ **Required State to Limit City Liability** - This is done with a write a letter from Caltrans Project Manager to Anaheim Traffic Manager and due care on both sides.
- ✓ **Required City to acquire new expertise** - Caltrans had to write a letter to Anaheim Traffic Manager indicating appreciation of efforts after the first trailer setups and the importance of future assistance to ensure that Anaheim’s field staff for the trailer moves would be available to learn.
- ✓ **Requires special security arrangements** - Anaheim coordinated involvement of Anaheim police. Caltrans provided photos of trailers for memo sent to Anaheim Police. Caltrans TMC staff were given map of trailer locations and phone number to Anaheim Police Dispatch if any alarms go off while in Anaheim.

### Cost

- ✓ **State Delivery of Trailers** - Get comments from Tadeo Lau and Ed Hepco on Manhours/Vehicles/Coordination required.
- ✓ **City participation in Trailer Setup** - Get comments from Anaheim
- ✓ **Anaheim TMC equipment installation** - Get comments from Hughes
- ✓ **City Personnel Training (TMC & Field Setup)** - Some of the training was done by Hughes and included in the general cost of the FOT, however, I made three visits (total 6 hours) and several phone calls to coordinate and make sure Anaheim staff at TMC would be better prepared/trained. While setting up trailers in the field, training time was spent with Anaheim staff, Larry Hazuka. This extended time for setting up, but not significantly. Additional time is probably required for fuller confidence that Anaheim could set these up on their own.

Objective - Institutional Issues, Benefits, and Costs associated with Information Sharing  
(Pros/Cons)

**Advantages of Event Traffic Video Sharing**

- Ÿ **Allows Caltrans to better manage freeway operation in vicinity of the Arrow Pond on 57** - Not during these first events, however, if an accident had happened as traffic merged onto 57 from the on ramp, the back up would have been noticed at the ramp and one of the cameras could have been turned to view the situation on the freeway. Anaheim would probably have called Caltrans TMC to let them know and the problem could have been cleared up faster.
- Ÿ **Facilitates Interagency Cooperation** - Yes, gave Caltrans TMC night shift chance to interact with local city and become more familiar with each other. Could view outbound activity from which they do not normally view.

**Disadvantage of Event Traffic Video Sharing**

- Ÿ **Share Common controls at different facilities** - No Conflict occurred for these events.

**Cost of Event Traffic Video Sharing**

- Ÿ **Utility Consumption at State and City** - Electricity cost were minimal. LPG used was around 120 gallons or more (need to check with Tadeo) at a cost of \$1.85/gal including tax.

**Appendix B:**  
**Trailer Setup and Maintenance Procedures**

## Post Emplacement Checklist

### A. Surveillance Trailer

1. Set all DC and AC circuit breakers in the trailer distribution units (gray boxes located on opposite ends of front inside of trailer) to ON except for the following:  
At DC circuit breaker box:
  - Levelers OFF
  - Light OFFAt AC circuit breaker box:
  - Air Conditioner OFF
  - Outside Outlets OFF
  - Light OFF
2. Set all circuit breakers at DC and AC distribution panels on electronic cabinet 1 to ON.
3. Set Pullizi Intelligent Power Controller in electronic cabinet 1 to ON.
4. Set power strips at both electronic cabinets to ON.
5. Set Local/Remote switch at side of cabinet 2 in REMOTE position.
6. Set Auto Generator Start/Stop panel AUTO/MANUAL switch to AUTO.
7. Set Aries Processor (located behind Generator Start/Stop panel) to ON.
8. Unplug RS-232 connector (J3) of each camera control receiver/driver, except for surveillance camera (to prevent accidental movement of antenna and VIP cameras).
9. Set security system cell telephone module to ON (red push button located inside right security system box). Push-button light should be ON.
10. Open floor and roof fan vents (close and secure main roof hatch). Lock all trailer doors and set security system. If a Ramp Trailer is part of emplacement, set security system after completing Ramp Trailer check list below.

### B. Ramp Trailer

1. Set all circuit breakers located in electronic cabinet to ON, with exception of the ALARM circuit breaker located on the Power Distribution Box.  
Note: The ALARM circuit breaker no longer activates the trailer security system. The Ramp Trailer security is activated by having all other DC circuit breakers set to ON.
2. Set Auto Generator Start/Stop panel AUTO/MANUAL switch to AUTO.
3. Set Aries Processor (located behind Generator Start/Stop panel) to ON.
4. Set cabled Signal Head ON/OFF switch to ON and METER ON indicator switches to ON and AUTO TRAK.
5. If a remote signal head is used, then set its ON/OFF switch to ON and its radio to ON.

### Surveillance Trailer Power Up Quick Reference

1. Ensure all circuit breakers and switches on the 120 VAC and +12 VDC panels located at electronic cabinet 1 are set to the OFF (down) position.
2. Ensure the AUTO/MANUAL switch on the Generator Auto Start/Stop Panel located at electronic cabinet 2 is set to MANUAL and the ARIES processor (located behind the panel) ON/OFF switch is set to OFF (down).
3. At trailer +12 VDC distribution box (gray box at side opposite to entry door), set the following circuit breakers to the ON (towards label) position in the order listed:  
  
MAIN 12V, VENT FAN, ELECTRONIC DIST, LIGHTING, AUTO MAST  
  
At the same +12 VDC distribution box, ensure the following are set to the OFF position:  
  
STAB CONT
4. At trailer 120 VAC distribution box (gray box just to right of entry door), set the following circuit breakers to the ON (towards label) position in the order listed:  
  
MAIN, GENERATOR, BAT CHARGER, AIR COMPRESSOR, 2 GFI DUPLEX (inside outlets), ELECTRONICS DIST, LIGHTING  
  
At the same 120 VAC distribution box, ensure the following are set to the OFF position:  
  
COMMERCIAL, AIR CONDITIONER, GFI RECEPTICAL (outside outlets)
5. Turn ON all circuit breakers and switches at both the +12 VDC and 120 VAC distribution panels located at electronic cabinet 1. Wait for the Wide Area Communications Controller (WACC) to boot up (approximately one minute). The single edge-mounted status indicator on each WACC circuit card will flash with a duty of cycle of approximately one second or less.
6. Ensure each power strip ON/OFF switch is set to the ON (up) position.
7. Set the Generator Auto Start/Stop Panel Aries Processor (located behind charge panel) ON/OFF switch to the 12 VDC ON (up) position. When the processor completes its boot up (less than five seconds), it will activate the generator off relay (relay closest to the processor) for 15 seconds. Observe light in relay when activated.
8. When the generator off relay is deactivated, set the Generator Auto Start/Stop Panel AUTO/MANUAL switch to the AUTO position.

## Local Camera And Main Antenna Control Procedure

This procedure starts with the assumption that the surveillance trailer power up sequence is complete, the Generator Automatic Start/Stop Panel AUTO/MAN switch is set to AUTO, and the computer keyboard is connected to its wide area communications controller node.

1. At electronic cabinet 2, ensure that the REMOTE/LOCAL switch (located on the side of the cabinet and behind telephone jack) is set to the REMOTE position.
2. At the computer keyboard, set caps lock and type 8:A0 followed by return. This powers up the camera video and control systems and antenna movement control.
3. At the +12 VDC Distribution Panel located at electronic cabinet 1, set the RELAY BOARD switch to the OFF (down) position (allows local switching of cameras).
4. At electronic cabinet 2, set the REMOTE/LOCAL switch to the LOCAL position.
5. At electronic cabinet 2, ensure that the RS-232 cables are plugged into their respective camera control receiver/drivers.

At this point, the three mast mounted cameras and antenna can be controlled from the camera control keyboard.

6. Toggle the MON keyswitch until a 1 is displayed.
7. Select the unit to be controlled by entering its ID as shown in the table below. Then press the CAM keyswitch.

Unit ID	Description
xx	Surveillance Camera
1xx	VIP camera 1
2xx	VIP camera 2
3xx	Security Camera (This camera is fixed in position and, therefore, does not have a receiver/driver.)
4xx	Antenna

xx is the last two digits of the surveillance trailer license number.

8. To view a particular camera's video on the NTSC monitor, ensure the monitor is ON and select the video via switches 1 (surveillance), 2 (VIP 1), and 3 (VIP 2) on the video switcher located in electronic cabinet 2 (on the right). Switch 4 selects the security camera.
9. When finished, set REMOTE/LOCAL switch to REMOTE, RELAY BOARD switch at electronic cabinet 1 to ON, disconnect RS-232 cables from the antenna and VIP camera receiver/drivers (to prevent inadvertent remote movement), and type 8:K followed by return at the computer keyboard.

### Surveillance Trailer Camera Selection Procedure

Each of the surveillance trailers has four cameras that can be selected via the single camera control keyboards located at the City of Anaheim TMC and the Caltrans District 12 TMC. The control keyboard at Caltrans is in the room that contains the Front End Processor (FEP). The cameras that can be controlled are: one color surveillance camera containing a zoom lens on a pan and tilt mechanism, two black and white cameras with fixed field of view (without a zoom lens) on pan and tilt heads, one black and white security camera with a fixed field of view directed towards the trailer access door (not on a pan and tilt mechanism). The single NTSC output of the video decoder installed at the Anaheim TMC is interfaced to Channel 22 of the video matrix switch. Only one video can be viewed at any one time at the Anaheim TMC.

To select a video image from a camera, perform the following at the camera control keyboard:

1. Ensure that a 1 is displayed on the LED display. If not displayed, depress and release the MON keyswitch until a 1 is displayed.
2. Select a camera at a particular trailer by entering the camera identification number (ID) followed by pressing the CAM keyswitch. The ID for each color surveillance camera is the last two digits of the license plate of the trailer on which the camera is located. Thus, the surveillance camera ID numbers are 09, 10, 11, 13, 14, and 15. IDs for the remaining cameras consist of the trailer ID preceded by a 1 (for VIP camera 1), 2 (for VIP camera 2), or 3 (for security camera). The number 4 allows control of the antenna. The table below lists the camera IDs for trailers 09 and 11 as examples.

Camera ID	Controlled Camera
09	Trailer 09 color surveillance camera
109	Trailer 09 VIP camera 1
209	Trailer 09 VIP camera 2
309	Trailer 09 security camera
11	Trailer 11 color surveillance camera
111	Trailer 11 VIP camera 1
211	Trailer 11 VIP camera 2
311	Trailer 11 security camera

As an example of actual keyswitch procedure, Trailer 11's black and white VIP camera 1 is selected by pressing the 1 keyswitch three times, and then pressing the CAM keyswitch. It may take several seconds for the video to appear on the monitor at the TMC due to the trailer powerup sequence and the time required for acquisition of the video data by the video decoder.

3. **IMPORTANT:** When finished viewing the desired surveillance trailer CCTV, turn off the trailer by entering surveillance camera ID (09, 10, 11, 13, 14, or 15). Then press OFF on the keyboard. When trailer operations are completed for the day, perform this OFF procedure for all six surveillance trailers to ensure that no trailers are accidentally left on due to a remote command. This will prevent waist of trailer generator fuel.

## Maintenance Check List

### 1. GENERATOR

Place the trailer in manual mode when performing the following procedures on the generator. The keys for the security system cabinet are located in the long shelf above work bench.

- Check generator oil level every 150 hours of generator run time. Place AUTO/MANUAL switch located at charge panel to MANUAL before working on generator.
- Check generator air filter bimonthly and after strong wind conditions.
- Change oil and oil filter per Onan Owner's Manual instructions.
- Change fuel filter per Onan Owner's Manual instructions.

### 2. COMPRESSOR

- Compressor is self lubricated. No lubrication maintenance required.
- Check and clean air filter pad.

### 3. BATTERIES

- Check main battery fluid level at least twice a month.
- Check secondary battery fluid level at least twice a month.
- Check specific gravity of all batteries at least twice a month.
- Check and clean battery terminals and battery compartment as required.

### 4. MAST

Clean and oil mast whenever retracted. Clean with alcohol applied with cloth. Lubricate with TMD Mast Lubricant, Will Burt P/N 600. A can was supplied for each mast.

### 5. MISCELLANEOUS

- Check LPG tank fuel level.
- Ensure tires have adequate pressure (especially just prior to trailer movement).
- Ensure axles are adequately lubed (especially prior to trailer movement).
- Clean inside of trailer after heavy winds.

**Appendix C:**  
**Trailer Transport Data Sheets for Anaheim Special Event Test**

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date:	3/26/97	Trailer Number:	111	Original Location: I-5 Northbound at Culver Drive	
Destination: Ball Road and SR-57 NB onramp			Towed By: Caltrans		
			Observed by: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
7:48am					Tow vehicle arrived. Waited for Tadeo Lau to arrive before hooking up to trailer.
					Mast on trailer was extended when removal operations began.
8:00am					Oriented cameras and antenna for safe mast retraction
					- above task complete at 8:07am
					Manual mast retraction used as automatic mode not operational.
					Tadeo explaining to tow truck drivers how to park trailer at the destination.
	8:34am				
		8:59am			Phoenix Club Dr. and Ball Rd. Stopped to coordinate ramp closing with Ed Hepco so that trailer could be safely placed on the onramp pullout at SR-57 NB.
		9:06am			At ramp pullout location. Ramp closure to allow trailer to backup onto pullout area required 2 extra people.
		9:20am			Trailer at "preliminary" destination on pullout. Brian checking signal strength.
			9:24am		Trailer still hooked to tow vehicle. Mast raised. Checked camera FOV.
				9:45am	Stopped setup to go to the 2nd trailer (Trailer #113) so that Ed's tow crew could be released. Chock trailer tires, set outriggers. Right outrigger not working.
				9:48am	Tow vehicle detached. Tadeo and Brian will return either this afternoon or tomorrow to complete setup and test of video relay link.
				9:56am	Trailer door closed.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					
Institutional Issue for future trailer use: Anaheim may not have vehicles nor funds to move trailers when the FOT ends.					
Perhaps funding will materialize if FOT demonstrates the benefits of the trailers for traffic management at special events.					
Anaheim must provide funding for training hours so that their personnel can learn how to setup and operate trailers.					

Data Sheet in Support of Test Objective 1 (Examine Portability) of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date:	3/26/97	Trailer Number:	113	Original Location: I-5 Southbound at First Street	
Destination: Sunkist St. and Cerritos Ave. (SE corner)			Towed By: Caltrans Observed by: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
10:13am					Antenna rotated horizontally so it protrudes the least amount above the top railing during transport.
	10:35am				
		11:05am			
			11:20am		Trailer reoriented so that door faces Sunkist St. Setup ends with call to Anaheim TMC to see if they are receiving video. Could not turn on trailer from District 12 TMC because of an error in the programming of the new icons for the Anaheim FOT. Will be corrected this afternoon by Tadeo. Did turn on the trailer power and cameras from the Anaheim TMC at 12:10pm, but could not see video from Trailer #113 at the Anaheim TMC. Brian later fixed this problem at the Anaheim TMC.
				12:30pm	
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data\_115

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date:	3/27/97	Trailer Number:	115	Original Location: I-5 NB in Main Place Caltrans Pullout near CA-22 West offramp	
Destination: Cerritos Ave. and State College Blvd. (NE corner)			Towed By: Caltrans		
			Observed by: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
7:59am					Tadeo arrives.
8:01am					Tow vehicle arrives.
8:03am					Drop mast procedure begins.
8:24am					Raise hitch on trailer to better level trailer in tow.
8:30am					Safety chain clamps missing. Tadeo leaves to retrieve some clamps from a trailer moved yesterday.
8:50am					Tadeo returns with clamps.
	8:51am				
		9:12am			
			9:25am		Raise mast.
				9:52am	Anaheim TMC turned on the trailer remotely. Also verified that Anaheim TMC could turn on Trailers 111 and 113. Test complete.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
<b>Date:</b>	4/2/97	<b>Trailer Number:</b>	115	<b>Original Location: State College and Cerritos (NE corner)</b>	
<b>Destination: Cerritos and Sunkist (SW corner)</b>			<b>Towed By: Caltrans</b>		
			<b>Observed By: L. Klein</b>		
<b>Began</b>	<b>Hitched</b>	<b>Arrived</b>	<b>Set</b>	<b>Departed</b>	<b>Comments</b>
8:10am					Open trailer door, stop generator, record generator on time in log, lower mast, rotate and stow cameras and antenna, secure hatch, raise outriggers.
	8:27am				
		8:31am			
			8:45am		
				9:03am	Verified control by Anaheim TMC
				9:07am	Departed
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

<b>Data Sheet in Support of Test Objective 1 (Examine Portability)</b>					
<b>of Individual Evaluation Plan for Test #2 - City of Anaheim</b>					
<b>Date:</b>	4/2/97	<b>Trailer Number:</b>	113	<b>Original Location: Cerritos Ave. and Sunkist St. (SE corner)</b>	
<b>Destination: State College &amp; Cerritos (NE corner)</b>				<b>Towed By: Caltrans</b>	
				<b>Observed By: L. Klein</b>	
<b>Began</b>	<b>Hitched</b>	<b>Arrived</b>	<b>Set</b>	<b>Departed</b>	<b>Comments</b>
9:15am					Open trailer door, turn off generator, record generator on time (this generator was on manual), lower mast, rotate and stow cameras and antenna, secure hatch, raise outriggers.
9:25am					Began to back tow vehicle into position - tight space available in parking lot because of where other passenger cars were parked.
	9:34am				
		9:40am			Gardening crew temporarily parked in trailer site parking spaces.
			9:50am		Trailer in place.
				10:03am	Verified control by Anaheim TMC.
				10:10am	Depart
<b>NOTES FOR KEYBOARD CONTROLS:</b>					
8:A0 (ENTER) to turn on power controller in the trailer					
8:K (ENTER) to turn off (kill) power controller					
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date: 4/8/97	Trailer Number: 111	Original Location: SR-57 and Ball Rd (NB on-ramp pullout area)			
Destination: Cerritos Av. & Sunkist Rd. (SW corner)		Towed By: Caltrans (smaller tow vehicle used)			
Observed By: L. Klein					
Began	Hitched	Arrived	Set	Departed	Comments
9:00 a.m.					
9:12 a.m.					Prehitch preparations complete.
					Lower trailer hitch donut to better mate with tow vehicle.
	9:23 a.m.				Hitched.
	9:32 a.m.				Trailer lights checked. Electrical connector had to be pushed more securely into tow vehicle receptacle.
		9:44 a.m.			Temporarily stow trailer in SE corner parking lot. Plan is to move Trailer 115 to SR-57 and Ball Rd. Then move Trailer 111 into SW corner parking lot (in place vacated by 115) because the camera image is better from this location for viewing Pond egress traffic (less blockage by trees).
	10:56 a.m.				Tow vehicle at SE corner parking lot to hitch up to Trailer 111 for the second time.
	10:58 a.m.				Hitched to Trailer 111 in SE corner parking lot.
		11:01 a.m.			At SW corner parking lot.
			11:06 a.m.		Rotate antenna and cameras.
			11:16 a.m.		Trailer turned on by Anaheim TMC. Receiving a "good" image. Turned off by TMC.
				11:20 a.m.	Depart.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					



Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date:	5/6/97	Trailer Number:	115	Original Location: I-5 at Main Place Mall nr CA 22 west exit	
Destination: Cerritos Av & Sunkist St (SW corner)				Towed By: Caltrans large tow truck	
				Observed By: L. Klein	
Began	Hitched	Arrived	Set	Departed	Comments
7:35am					Battery dead. Tried to jump start, but trailer still did not start.
					Problem turned out to be a defective starter in the generator.
					The defective generator was replaced by Hughes in the afternoon with one from a trailer still on the Hughes lot.
8:35am					Finished stowing mast and other tasks in preparation for move to Cerritos & Sunkist.
	8:45am				
		9:02am			Arrived at Cerritos and Sunkist.
			9:15am		Outriggers deployed. Mast not deployed and signal transmission not checked because trailer could not be turned on.
					Comment by Larry Hazuka: The person driving the large tow truck appeared to be more skilled in backing the trailer into position than the previous crew.
					Therefore, the issue is one of tow-truck operator skill and not large vs. small tow truck that affects the time it takes to position the surveillance trailer.
				9:16am	
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	4/10/97	Trailer Number:	113	Original Location: Cerritos Ave & State College Blvd	
Destination: I-5 and First Street Caltrans Yard				Towed By: Caltrans using small boom truck as tow vehicle	
				Observed By: L. Klein	
Began	Hitched	Arrived	Set	Departed	Comments
9:42 a.m.					
	9:50 a.m.				Going to Caltrans Orange Yard to add air to trailer tires.
		10:27 a.m.			At First Street Yard alongside I-5 SB.
			10:32 a.m.		
			10:36 a.m.		Checking voltage at antenna for signal strength. Measured 7.9 to 8 volts, indicating a strong signal. Signal very sensitive to antenna position.
				10:49 a.m.	Depart.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #2 - City of Anaheim					
Date:	5/6/97	Trailer Number:	113	Original Location: I-5 Southbound at First Street	
Destination: Ball Rd at SR-57 NB onramp			Towed By: Caltrans		
			Observed By: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
9:32am					Arrived at I-5 and First Street.
9:42am					Finished stowing mast and other predeparture tasks.
	9:48am				Hitched.
	9:50am				Leave I-5 and First Street site.
		10:10am			Arrived at Ball Rd at SR-57 NB onramp.
			10:42am		Trailer turned on by Anaheim TMC. Picture at TMC was "changing color."
			10:45am		Tadeo and Hughes will try to improve the signal transmission link.
				10:55am	Left for Anaheim TMC to instruct the TMC operator for tonight's data collection and to observe the video reception.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

**Appendix D:**  
**Camera Operability Data Sheets for Anaheim Special Event Test**

DATASH\_2XLS

Camera Image and Control Operability Check Data Sheet Support of Test Objective 2 (Trailers Work for Traffic Management) Individual Evaluation Plan for Test #2 - City of Anaheim												
Date: 4/1/97 Event: HOCKEY Data taken by: CWT		Trailer Number: 111		Trailer Location: BALL 157 Weather/Visibility: CLEAR - WINDY								
PART 1												
Operability Check	Image	Camera 1 Pan	Tilt	Zoom	Image	Camera 2 Pan	Tilt	Image	Camera 3 Pan	Tilt	Camera 4 Image	
6:00	X	X	X	X	X	X	X	X	X	X	X	
6:30	X	X	X	X	X	X	X	X	X	X	X	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												

Camera 1 = Surveillance camera (color)  
 Camera 2 = VIP camera #1 (black and white)  
 Camera 3 = VIP camera #2 (black and white)  
 Camera 4 = Security camera (black and white)

• positive response (camera image available or control available)  
 • negative response (camera image not available or control not available)

Brian & Scott went to trailer to check out the reason for the weak video.  
 Turn off trailer <sup>from TMC</sup> at 6:35pm per request from Brian when he reached trailer.  
 If cameras are useful for traffic mgmt at this event, then a different preprogrammed timing plan will be implemented for the affected signal.





Camera Image and Control Operability Check Data Sheet in Support of Test Objective 2 (Trailers Work for Traffic Management) of Individual Evaluation Plan for Test #2 - City of Anaheim						
Date:	Trailer Number:	Trailer Location:	Weather/Visibility:			
Event:						
Date taken by:				PART 2		
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem.						
Problem Number	Description					
1	IRIS OPENING TO BRIGHT					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

D12 TMC: 724-2951  
-2400

DATASH\_2XLS

Camera Image and Control Operability Check Data Sheet  
in Support of Test Objective 2 (Trailers Work for Traffic Management)  
of Individual Evaluation Plan for Test #2 - City of Anaheim

Date: 4/1/97 Trailer Number: 2115 Trailer Location: CERRITOS/ST COLLEGE  
Event: HOCKEY Weather/Visibility: CLEAR - WINDY at start of event.  
Data taken by: Curt

PART 1

Operability Check	Image	Camera 1	Tilt	Zoom	Image	Camera 2	Tilt	Image	Camera 3	Tilt	Camera 4
		Pan				Pan			Pan		Image
6:00 PM	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6:44	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7:05	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7:35	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8:05	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8:35	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9:08	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10											
11											
12											
13											
14											
15											
16											

Camera 1 = Surveillance camera (color)  
Camera 2 = VIP camera #1 (black and white)  
Camera 3 = VIP camera #2 (black and white)  
Camera 4 = Security camera (black and white)

/ = positive response (camera image available or control available)  
x = negative response (camera image not available or control not available)

Camera 1: WB approach of Cerritos @ State College Blvd.  
Camera 2: " " " " " " " "  
Camera 3: View EB ~~approach~~ traffic on ~~State~~ Cerritos Ave.

Three blocks more effective use of  
1 Camera 215 (Camera 3) from observing EB traffic on Cerritos Ave.

Camera Image and Control Operability Check Data Sheet in Support of Test Objective 2 (Trailers Work for Traffic Management) of Individual Evaluation Plan for Test #2 - City of Anaheim						
Date:	Trailer Number:	Trailer Location:				
Event:		Weather/Visibility:				
Data taken by:		PART 2				
For each x entered in Part 1 of the data sheet enter an explanation below to characterize the problem.						
Problem Number	Description					
1	IMAGE GRAINY CAMERA #15					
2	<del>IMAGE TO BRIGHT CAMERA 315</del> Grainy on 115					
3	Image too bright on camera 315					
4	Image Grainy (dark) on 115.					
5	Cannot tell if camera is PIT/2 because image is too dark.					
7:356	IMAGE GRAINY ON 15.					
8:057	"					
8:358	"					
9:059	"					
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date:	9/4/97	Trailer Number:	111	Trailer Location:	BALL RD / SR 57 FWY							
Event:	HOCKEY	Weather/Visibility:	CLEAR									
Data taken by:	CSR											
PART 1												
Operability	Camera 1				Camera 2			Camera 3			Camera 4	
Check	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
1710	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1740	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1800	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1900	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2010	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2125	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
Camera 1 = Surveillance camera (color)					W APPROACH AT BALL / SR 57 FWY							
Camera 2 = VIP camera #1 (black and white)					N/B OFF RAMP BALL / SR 57 FWY							
Camera 3 = VIP camera #2 (black and white)					QB BALL / SR 57 FWY							
Camera 4 = Security camera (black and white)												
✓ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

THIS IS A BETTER POSITION FOR CAMERAS  
THAT PREVIOUS SITE.

Outbound finished @ 10:55 pm  
from Pond Traffic. Baseball  
on a football game.



**Camera Image and Control Operability Check Data Sheet**  
**In Support of Test Objective 2 (Trailers Work for Traffic Management)**  
**of Individual Evaluation Plan for Test #2 - City of Anaheim**

Date: 4/4/92 Trailer Number: 113 Trailer Location: ST. COLLEGE / CERRITOS  
 Event: HOCKEY Weather/Visibility: CLEAR  
 Data taken by: CSB

PART 1

Operability Check	Camera 1				Camera 2			Camera 3			Camera 4
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image
1710 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1740 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1800 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1915 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1920 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2025 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2125 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8											
9											
10											
11											
12											
13											
14											
15											
16											

Camera 1 = Surveillance camera (color)      W/B ~~CERRITOS~~ CERRITOS AT ST. COLLEGE  
 Camera 2 = VIP camera #1 (black and white)      W/B APPROACH CERRITOS AT ST. COLLEGE  
 Camera 3 = VIP camera #2 (black and white)      E/B TRAFFIC IN INTERSECTION CERRITOS / ST. COLLEGE  
 Camera 4 = Security camera (black and white)

/ = positive response (camera image available or control available)  
 x = negative response (camera image not available or control not available)

Camera Image and Control Operability Check Data Sheet	
in Support of Test Objective 2 (Trailers Work for Traffic Management)	
of Individual Evaluation Plan for Test #2 - City of Anaheim	
Date:	Trailer Number:
Event:	Trailer Location:
Data taken by:	Weather/Visibility:
	PART 2
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .	
Problem Number	Description
1920 1	IMAGE TOO DARK - IRIS NEED ADJUSTING
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date: 4/4/97		Trailer Number: 115			Trailer Location: CERRETOS / SUNKIST							
Event: HOCHBY		Weather/Visibility: CLR										
Data taken by: CSB												
PART 1												
Operability Check	Camera 1				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
1710 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1740 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1800 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1925 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2015 5	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2230 6	X	✓	✓	✓	X	✓	✓	X	✓	✓	X	
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Camera 1 = Surveillance camera (color)		W/B APPROACH CERRETOS AT SUNKIST										
Camera 2 = VIP camera #1 (black and white)		E/B LANES CERRETOS AT SUNKIST										
Camera 3 = VIP camera #2 (black and white)		S/B APPROACH CERRETOS AT SUNKIST										
Camera 4 = Security camera (black and white)												
/ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

← REACCESSSED TRAILER DOWN NO PROBLEM W/ IMAGE

SUNKIST

Camera Image and Control Operability Check Data Sheet	
In Support of Test Objective 2 (Trailers Work for Traffic Management)	
of Individual Evaluation Plan for Test #2 - City of Anaheim	
Date:	Trailer Number:
Event:	Trailer Location:
Data taken by:	Weather/Visibility:
PART 2	
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .	
Problem Number	Description
2015 1	IMAGE TOO DARK - IRI'S NEEDS ADJUSTING
22302	COLOR BARS MISSING SIGNAL CAMERAS 15/1157 215/215
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date: 4/9/97		Trailer Number: 111			Trailer Location: CERRITOS / SUNKIST							
Event: HOCKEY		Weather/Visibility: CLEAR - WINDY										
Data taken by: CSB												
PART 1												
Operability Check	Camera 1				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
1730 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1830 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
<del>1830</del> 3												
1930 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2035 5	X	✓	✓	✓	X	✓	✓	X	✓	✓	X	
2124 6	X	✓	✓	✓	X	✓	✓	X	✓	✓	✓	
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
S/B APPROACH SUNKIST & CERRITOS												
Camera 1 = Surveillance camera (color) ← (S/B LANES CERRITOS W/O SUNKIST)												
Camera 2 = VIP camera #1 (black and white)												
Camera 3 = VIP camera #2 (black and white) W/S APPROACH SUNKIST & CERRITOS												
Camera 4 = Security camera (black and white)												
/ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

Double event: Baseball @ Anaheim Stadium + Hockey at the Pond. Hockey game ended before the baseball game.

Camera Image and Control Operability Check Data Sheet									
in Support of Test Objective 2 (Trailers Work for Traffic Management)									
of Individual Evaluation Plan for Test #2 - City of Anaheim									
Date:	Trailer Number:	Trailer Location:							
Event:	Weather/Visibility:								
Data taken by:	PART 2								
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .									
Problem Number	Description								
2035-1	FLAKY IMAGE (COLORBARS) ALL CAMERAS "								
2124-2	"								
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date:	4/9/97	Trailer Number:	113	Trailer Location:	CERRITOS / ST. COLLEGE							
Event:	HOCKEY	Weather/Visibility:	CLEAR - WINDY									
Data taken by:	CSB											
PART 1												
Operability Check	Camera 1				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
1745 1	X	X	X	X	X	X	X	X	X	X	X	
1855 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1935 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2040 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2127 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Camera 1 = Surveillance camera (color) E/B LAJES CERRITOS <del>W/B</del> E/O ST. COLLEGE												
Camera 2 = VIP camera #1 (black and white) E/B APPROACH CERRITOS AT ST. COLLEGE												
Camera 3 = VIP camera #2 (black and white) W/B TRAFFIC MID-INTERSECTION												
Camera 4 = Security camera (black and white)												
/ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

Camera Image and Control Operability Check Data Sheet											
In Support of Test Objective 2 (Trailers Work for Traffic Management)											
of Individual Evaluation Plan for Test #2 - City of Anaheim											
Date:	Trailer Number:	Trailer Location:									
Event:		Weather/Visibility:									
Data taken by:		PART 2									
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .											
Problem Number	Description										
* 1745 1	TRAILER NON-RESPONSIVE										
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											

\* RICK Anderson was already working the problem of the trailer. Realigned the antenna to increase signal strength.

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date:	4/7/97	Trailer Number:	115	Trailer Location:	BALL RD. / SR-57 FREEWAY							
Event:	HOCKEY	Weather/Visibility:	CLEAR - WINDY									
Data taken by:	CSB											
PART 1												
Operability Check	Camera 1 *				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
1753 1	X	✓	✓	✓	X	✓	✓	X	✓	✓	✓	
1850 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1940 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2043 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2130 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Camera 1 = Surveillance camera (color)		W/B APPROACH BALL RD / SR-57 FREEWAY										
Camera 2 = VIP camera #1 (black and white)		N/B OFF RAMP SR-57 FWY / BALL										
Camera 3 = VIP camera #2 (black and white)		E/B LANES BALL W/D N/B OFF RAMP										
Camera 4 = Security camera (black and white)												
/ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												
* = IMAGE GRAINY & DARK AFTER DUSK												

Camera Image and Control Operability Check Data Sheet									
In Support of Test Objective 2 (Trailers Work for Traffic Management)									
of Individual Evaluation Plan for Test #2 - City of Anaheim									
Date:	Trailer Number:	Trailer Location:							
Event:		Weather/Visibility:							
Data taken by:		PART 2							
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .									
Problem Number	Description								
1753 1	FLAKY IMAGE (COLOR-BARS) CAMERA 15, 115, 1213								
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date: 5/6/97		Trailer Number: 113			Trailer Location: Ball + SR-57 (NB on ramp)							
Event: Ducks Playoff Game		Weather/Visibility:										
Data taken by: Toan Tran		Caltrans Number: 724-2607										
PART 1												
Operability Check	Camera 1 (Color)				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
5:30 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6:30 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7:30 3	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	
8:30 4	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	
9:30 5	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	
10:30 6	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Camera 1 = Surveillance camera (color)												
Camera 2 = VIP camera #1 (black and white)												
Camera 3 = VIP camera #2 (black and white)												
Camera 4 = Security camera (black and white)												
/ = positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

Interview of Toan by L. Klein on 5/7/97 @ 3 PM:  
 Imagery from the trailer <sup>(on Cerritos and Sunkist)</sup> was <sup>Page 1</sup> useful in setting timing plan for traffic exiting the Pond & turning left on Sunkist, heading towards Katella. When buildings be modified the timing plan to allow for maximum left signal timing.

Camera Image and Control Operability Check Data Sheet									
in Support of Test Objective 2 (Trailers Work for Traffic Management)									
of Individual Evaluation Plan for Test #2 - City of Anaheim									
Date:	5/6/97	Trailer Number:	113	Trailer Location:					
Event:		Weather/Visibility:							
Data taken by:									
									PART 2
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .									
Problem Number									Description
X	1								good image, but <del>fast</del> picture flash too much about 1/sec
	2								
	3								
	4								
	5								
X	6								good image, flashing too much.
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

Interview of Toan by L. Klein on 5/7/97 @ 3 PM:

Flashing means video was changing color.

Larry Nieuw  
 (714) 996-9066

Camera Image and Control Operability Check Data Sheet												
in Support of Test Objective 2 (Trailers Work for Traffic Management)												
of Individual Evaluation Plan for Test #2 - City of Anaheim												
Date: 5/6/97		Trailer Number: 115			Trailer Location: Cerritos + SunKist							
Event: Ducks Playoff Game		Data taken by: Toan Tran			Weather/Visibility:							
PART 1												
Operability Check	Camera 1 (Color)				Camera 2			Camera 3			Camera 4	
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image	
5:35 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6:35 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7:35 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
8:35 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
9:35 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
10:35 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Camera 1 = Surveillance camera (color)												
Camera 2 = VIP camera #1 (black and white)												
Camera 3 = VIP camera #2 (black and white)												
Camera 4 = Security camera (black and white)												
/= positive response (camera image available or control available)												
x = negative response (camera image not available or control not available)												

Camera Image and Control Operability Check Data Sheet									
in Support of Test Objective 2 (Trailers Work for Traffic Management)									
of Individual Evaluation Plan for Test #2 - City of Anaheim									
Date: 5/6/07	Trailer Number: 115	Trailer Location:							
Event:		Weather/Visibility:							
Data taken by:		PART 2							
For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem .									
Problem Number	Description								
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Camera Image and Control Operability Check Data Sheet  
 in Support of Test Objective 2 (Trailers Work for Traffic Management)  
 of Individual Evaluation Plan for Test #2 - City of Anaheim

Date 5-8-97 Trailer Number 113 Trailer Location Ball & Phoenix  
 Event HOCKEY GAME Weather/Visibility \_\_\_\_\_  
 Data taken by NIVINE GEORGES

PART 1

Operability Check	Camera 1				Camera 2			Camera 3			Camera 4
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image
6:00 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7:00 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8:00 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9:00 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10:00 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11:00 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Camera 1 = Surveillance camera (color)  
 Camera 2 = VIP camera #1 (black and white)  
 Camera 3 = VIP camera #2 (black and white)  
 Camera 4 = Security camera (black and white)

/ = positive response (camera image available or control available)  
 x = negative response (camera image not available or control not available)

Camera Image and Control Operability Check Data She	
in Support of Test Objective 2 (Trailers Work for Traffic Management)	
of Individual Evaluation Plan for Test #2 - City of Anaheim	
Date:	Trailer Number:
Event	Trailer Location:
Data taken by:	Weather/Visibility:
PART 2	
For each x entered in Part 1 of the data sheet enter an explanation below to characterize the problem.	
Problem Number	Description
1	
2	
3	
4	camera 1: picture not clear (snowy)
5	"
6	"
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Comments:

- Picture of camera 1: not very clear, little bit fuzzy (when it is dark outside)
- The camera was not used for inbound because most cars come in ... on Ball Rd. + Katella.

The camera would have been used for outbound, except that outbound didn't start until 12:30 and camera was turned off after 11pm check.

inursuay, may 00, 10:00

Camera Image and Control Operability Check Data Sheet in Support of Test Objective 2 (Trailers Work for Traffic Management) of Individual Evaluation Plan for Test #2 - City of Anaheim											
Date 5-8-97 Trailer Number: 115				Trailer Location: Carrizos & Sunlight							
Event HOCKEY GAME				Weather/Visibility:							
Data taken by: NIVINE GEORGES											
PART 1											
Operability Check	Camera 1				Camera 2			Camera 3			Camera 4
	Image	Pan	Tilt	Zoom	Image	Pan	Tilt	Image	Pan	Tilt	Image
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Camera 1 = Surveillance camera (color)  
 Camera 2 = VIP camera #1 (black and white)  
 Camera 3 = VIP camera #2 (black and white)  
 Camera 4 = Security camera (black and white)

/ = positive response (camera image available or control available)  
 x = negative response (camera image not available or control not available)

D-28

Datash\_2.xls

Camera Image and Control Operability Check Data Sheet  
 in Support of Test Objective 2 (Trailers Work for Traffic Management)  
 of Individual Evaluation Plan for Test #2 - City of Anaheim

Date: \_\_\_\_\_ Trailer Number: \_\_\_\_\_ Trailer Location: \_\_\_\_\_  
 Event: \_\_\_\_\_ Weather/Visibility: \_\_\_\_\_  
 Data taken by: \_\_\_\_\_ PART 2

For each x entered in Part 1 of the data sheet, enter an explanation below to characterize the problem

Problem Number	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

**Appendix E:**  
**Trailer Transport Data Sheets for I-5 Test**

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #1 - Interstate 5					
<b>Date:</b>	4/10/97	<b>Trailer Number:</b>	111	<b>Original Location: Cerritos Ave &amp; Ball Rd</b>	
<b>Destination: I-5 NB at Culver Drive on-ramp</b>				<b>Towed By: Caltrans using small boom truck as tow vehicle</b>	
				<b>Observed By: L. Klein</b>	
<b>Began</b>	<b>Hitched</b>	<b>Arrived</b>	<b>Set</b>	<b>Departed</b>	<b>Comments</b>
8:09 a.m.					
	8:24 a.m.				Going to Orange Caltrans Yard to inflate trailer tires.
		8:45 a.m.			At Caltrans Yard.
		8:55 a.m.			Leave Caltrans Yard.
		9:12 a.m.			At I-5 and Culver Drive site.
			9:17 a.m.		Begin to raise mast and turn on equipment.
					To save time, antenna not aligned with Union Bank relay site. Tadeo will return next week to complete setup. Setup time is an issue this day because of scheduled 2 p.m. meeting at D12. Need to assure that all trailers are deployed along I-5 before 2 p.m.
				9:27 a.m.	Depart.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #1 - Interstate 5					
<b>Date: 4/10/97</b>		<b>Trailer Number: 115</b>		<b>Original Location: SR-57 NB on-ramp at Ball Road</b>	
<b>Destination: I-5 at Main Place</b>			<b>Towed By: Caltrans using small boom truck as tow vehicle</b>		
(near SR-22 Westbound exit)			<b>Observed By: L. Klein</b>		
Began	Hitched	Arrived	Set	Departed	Comments
11:05 a.m.					
	11:14 a.m.				
		11:40 a.m.			Did not add air to this trailer's tires. Tow vehicle made wrong turn on fwy, adding time to the move.
			11:45 a.m.		Color bar noise at Anaheim TMC when they turned on the trailer. Moved trailer location several times in the parking area in an attempt to improve the signal strength.
				12:40 a.m.	Depart.
					Suggestion by tow vehicle operator: Replace the hooks on the brake safety chain with a hook that has a spring latch to close the opening when it is attached to the tow vehicle.
Number of minutes to Hitch = "Began" - "Hitched":					
Number of minutes to Transport = "Hitched" - "Arrived":					
Number of minutes to Setup = "Arrived" - "Set":					
Number of minutes to Make Operational = "Set" - "Departed":					

Data Sheet in Support of Test Objective 1 (Examine Portability) of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	6/3/97	Trailer Number:	110 (Surv. Trailer)	Original Location: Hughes Fullerton lot	
Destination:	I-5 NB on-ramp at Jamboree Rd.			Towed By: Caltrans large boom truck	
				Observed By: L. Klein	
Began	Hitched	Arrived	Set	Departed	Comments
9:27am					Lower hitch on trailer to better align with hitch on tow truck
	9:52am				Brake lights on trailer not working. Isolated problem to wiring on trailer. Brake lights work if flashers are on. Will travel with flashers on.
	10:05am				Wash trailer at Hughes
	10:15am				Leave Hughes lot
		10:55am			Arrive at I-5 location
			11:13am		Mast raised
			11:57am		Good signal from relay site: measured about 8.0 volts
			12:12pm		Lower mast to adjust stops on color surv camera to allow viewing of NB & SB traffic
			12:25pm		Cameras and antenna operational again
			12:35pm		Trailer turned on from Anaheim TMC (icons not installed at D12 TMC). Good video at Anaheim TMC.
			1:10pm		Start verifying sequence of ramp meter signals in response to commands from 170 controller. Once this task is complete, plan is to set up AutoScope detection zones on the ramp and see if the ramp meter signal responds properly to vehicles crossing the detection zone.
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					

<b>Data Sheet in Support of Test Objective 1 (Examine Portability)</b>					
<b>of Individual Evaluation Plan for Test #1 - Interstate 5</b>					
<b>Date:</b>	<b>6/3/97</b>	<b>Trailer Number:</b>	<b>19280 (Ramp Trailer)</b>	<b>Original Location: Hughes Fullerton lot</b>	
<b>Destination: I-5 NB on-ramp at Jamboree Rd.</b>				<b>Towed By: Caltrans large sign truck</b>	
				<b>Observed By: L. Klein</b>	
<b>Began</b>	<b>Hitched</b>	<b>Arrived</b>	<b>Set</b>	<b>Departed</b>	<b>Comments</b>
9:09am					Start backup of tow truck to trailer
	9:15am*				Wash trailer at Hughes before towing to I-5
	10:15am				Leave Hughes lot
		10:55am			Arrive at I-5 on-ramp, which was already closed in anticipation of trailer arrival
		11:17am			Ramp meter trailer located at side of ramp. Begin setup of signal head.
			11:34am		Level signal head base & place sand bags under & on signal head base
			11:46am		Boom in place to lift upper part of signal head onto base
			11:49am		Upper signal head bolted onto base section
			11:53am		Reposition base so that car at stop line can see lower set of signals
			12:12pm		Place plastic bag covers over the permanent signal heads to indicate they are not in use. Align upper signal head of temp. signal with the ramp lane geom.
					Tape over "Two cars per green" sign on upper signal head.
			12:35pm		Finished with above tasks.
			12:41pm		Bring "Meter On" sign and solar panel to their location at ramp entrance
			1:05pm		Meter On sign installed at entrance to on-ramp
			1:10pm		Start verifying sequence of ramp meter signals in response to 170 commands
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					
* Need to add hooks to tow truck for properly attaching the trailer's safety brake cable.					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	6/14/97	Trailer Number: 109 (Surv. Trailer)		Original Location: Hughes Fullerton lot	
Destination: I-5 NB at Grand Avenue			Towed By: Caltrans large boom truck (Driver + assistant)		
			Observed By: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
5:48a.m.					Trailer equipment (mast, cameras) were stowed before boom truck arrived.
5:50a.m.					Raise hitch on trailer to mate with tow truck.
					Discussion of low air pressure in trailer tires.
6:09a.m.					Hitched (except for safety chain). Brake lights work with flashers on.
	6:25a.m.				Search for "D-clamps" for safety chain connection to tow truck - chain attached.
	6:29a.m.				Wash trailer.
	7:18a.m.				Tires pumped. Depart Hughes.
		7:50a.m.			
		8:11a.m.			Reset trailer so that door faces freeway.
			8:30a.m.		Mast up. Check camera FOV.
			8:47a.m.		Pull trailer forward (farther from ramp) to get better view of ramp traffic and to layout ramp passage, demand, and queue detection zones.
			8:55a.m.		Trailer set again. Adjust electronic limit stops on color and B/W cameras.
			9:55a.m.		Stops adjusted. Mast raised. Align antenna for maximum signal strength.
			10:30a.m.		Update AutoScope operating software with new version supplied by Econolite.
			10:35a.m.		Start to connect ramp meter power supply to signal head on left side of ramp.
			11:00a.m.		Set up AutoScope ramp detection zones.
			11:10a.m.		Check ramp signals as controlled by 170.
			11:15a.m.		Signals work.
			11:20a.m.		Meter-on sign not working.
			11:23a.m.		Brain and Tadeo continue setup until 12:30p.m. Further details on ramp meter trailer log.
				1:00p.m.	Depart
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					

Data Sheet in Support of Test Objective 1 (Examine Portability) of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	6/14/97	Trailer Number: 17368 (Ramp Trailer)		Original Location: Hughes Fullerton lot	
Destination: I-5 NB at Grand Avenue			Towed By: Caltrans large sign truck (Driver only)		
			Observed By: L. Klein		
Began	Hitched	Arrived	Set	Departed	Comments
6:00a.m.					
6:03a.m.					Raise hitch.
	6:15a.m.				Difficult to attach safety chain to tow truck because of small chain clearance on truck.. Move signal light section with solar panel toward rear of ramp trailer so that the tow truck does not hit the panel when making turns.
	7:18a.m.				Trailer washed, tires pumped, depart Hughes.
		7:50a.m.			First stop at bottom of ramp to remove meter-on sign. Ramp already closed when we arrived. Additional 2 pickup trucks and 2 small boom trucks with 5 other Caltrans personnel were at the ramp to effect the closure and assist with assembling the ramp meter signal heads and meter-on sign.
		8:12a.m.			Start to unload meter-on sign and solar panel at bottom of ramp.
			8:35a.m.		Meter-on sign and solar panel set. Rotated solar panel to align with sun.
			8:45a.m.		Begin setup of ramp signals at top of ramp.
			9:20a.m.		Right-side ramp signal set and solar panel aligned with sun.
			9:42a.m.		Left-side ramp signal set. Had to tilt upper signal head downward by adjusting allen set screws at bottom of signal head.
					On Monday, June 16, Brian and Tadeo returned to the site to change the antenna on the ramp trailer that communicates with the meter-on sign. It was changed from the stubby green antenna to a 10-inch whip with more gain. Brian also "tapped" the meter on time delay relay in the meter control box and reconnected the coax cables. These actions resulted in the meter-on sign working.
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					

Data Sheet in Support of Test Objective 1 (Examine Portability)					
of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	6/18/97	Trailer Number: 114 (Surv Trailer)			Original Location: Hughes Fullerton lot
Destination:	I-5 NB at Tustin Ranch Road			Towed By: Caltrans large boom truck	Observed By: L. Klein
Began	Hitched	Arrived	Set	Departed	Comments
7:20 a.m.					Tow trucks arrived.
	7:35a.m.				
	8:05a.m.				Washed trailers and then departed for freeway.
		9:00a.m.			Resurvey site to find best location for surveillance trailer to minimize damage to plants, mulch, and sprinkler heads. Plants and sprinklers were added at site since the last survey. Mulch made ground too soft to drive into area previously selected. Investigated area to right of the onramp as new location for surv. trailer.
					Used small bucket truck to check line of sight to relay in Santa Ana.
			11:10a.m.		Picture and transmission from surv. trailer confirmed by Anaheim TMC. Camera limit stops reset so that private property alongside onramp cannot be viewed.
			11:45a.m.		Reconfirm trailer control and video transmission by Anaheim TMC. Lunch break.
			12:45p.m.		Resumed check out of ramp signal control by 170.
			2:05p.m.		Signal control still intermittent. Possibly from problem with synchronization SSR on ramp trailer with SSR in surv. trailer.
			2:10p.m.		Open ramp. Setup AutoScope detection zones on the ramp. Because placement of surv. trailer at right of onramp locates it further from the mainline (than if it were on the freeway shoulder), AutoScope detection zones could not be setup on the mainline.
			2:30p.m.		AutoScope ramp detection zones operational. Ramp signal working.
				2:40p.m.	
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					

Data Sheet in Support of Test Objective 1 (Examine Portability) of Individual Evaluation Plan for Test #1 - Interstate 5					
Date:	6/18/97	Trailer Number: 17369 (Ramp Trailer)		Original Location: Hughes Fullerton lot	
Destination: I-5 NB at Tustin Ranch Road				Towed By: Caltrans large sign truck	
				Observed By: L. Klein	
Began	Hitched	Arrived	Set	Departed	Comments
7:20a.m.					Tow trucks arrived.
	7:35a.m.				
	8:05a.m.				Washed trailers and then departed for freeway.
		9:00a.m.			Ramp closed when the trailers arrived. 3 extra trucks were there to close the ramp and assist with unloading the signal head from the ramp trailer and assembling it.
					Only one pair of ramp meter signals was needed at this location. Since there was no meter-on sign permanently installed, the meter-on sign from the ramp trailer was not deployed.
			10:45a.m.		Ramp signal setup on right side of ramp.
			11:00a.m.		Ramp trailer in place and connected to signal at side of ramp.
Number of minutes to Hitch = "Hitched" - "Began":					
Number of minutes to Transport = "Arrived" - "Hitched":					
Number of minutes to Setup = "Set" - "Arrived":					
Number of minutes to Make Operational = "Departed" - "Set":					