LANE ALERT 2X BIDIRECTIONAL PAVEMENT MARKINGS PILOT PROJECTS

The California Department of Transportation's (Caltrans) will begin pilot projects in the San Diego and Sacramento areas to test a new and innovative pavement marking visible only to wrong-way drivers. LaneAlert 2x™ is an innovative countermeasure to wrong-way driving. This technologically advanced bidirectional pavement marking provides a single directional, clear, concise message to motorists in conditions most prone to wrong way driving.

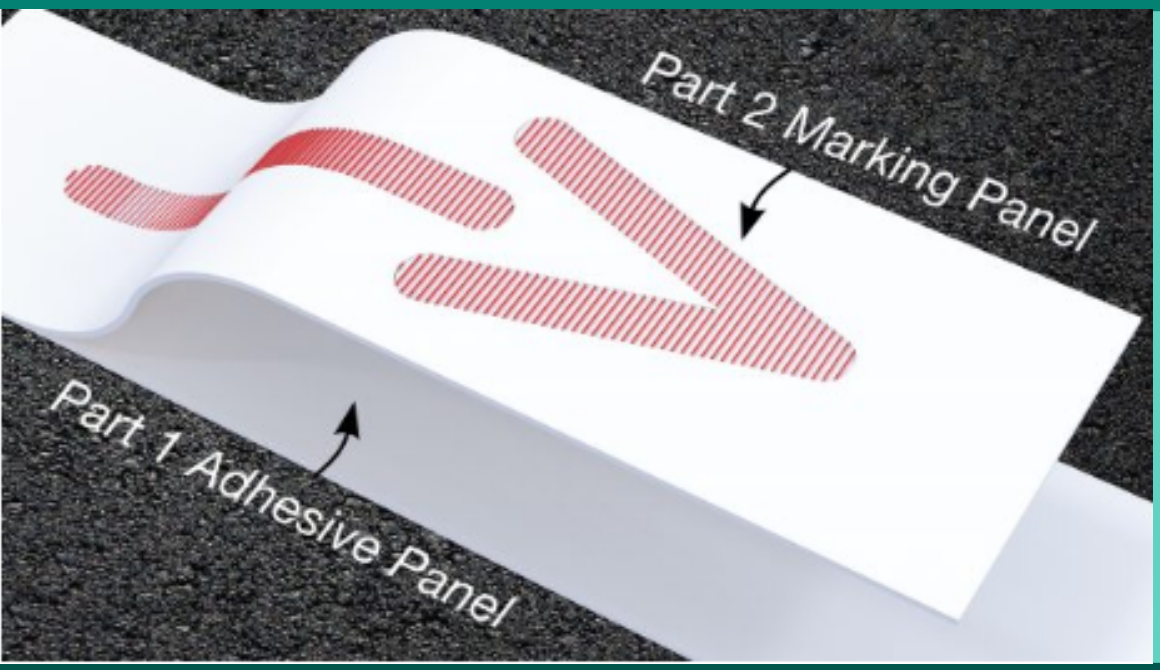
The pilot projects will be initiated in fiscal year 2020 with implementation starting in the early summer. In all, 30 exit ramps in San Diego and 10 exit ramps in Sacramento will receive a package of bi-directional pavement markings that have been approved by the California Traffic Control Devices Committee and the Federal Highway Administration.

PILOT PROJECT GOALS

- Install a new innovative pavement marking at 30 ramps in San Diego and 10 ramps in Sacramento
- Research and test new and emerging technologies
- Data driven evaluation of new technologies
- Reduce wrong-way driver collisions
- Save lives

DID YOU KNOW?

Caltrans will be the first public transportation agency officially approved by FHWA to conduct a Pilot Project for LaneAlert2X™.



- 250 feet on lane line and edge lines with embedded red arrows
- Type V Arrows with embedded red arrows
- Red "DO NOT ENTER" embedded in 24" limit line

Stay Informed:
California Department of Transportation
Division of Traffic Operations
1120 N Street, MS 36 | Sacramento, CA 95814

Traffic@dot.ca.gov
http://dot.ca.gov/contact-us

DRAFT February 10, 2020

DEPARTMENT OF TRANSPORTATION
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Serious drought.
Help save water!

October 9, 2019

Office of Transportation Operations
Federal Highway Administration (FHWA)
1200 New Jersey Avenue, SE
Washington, DC 20590
Attention: MUTCD Team
MUTCDofficialrequest@dot.gov

Subject: REQUEST TO EXPERIMENT

- NON-STANDARD BI-DIRECTIONAL PAVEMENT MARKING
- LaneAlert2X Wrong Way Pavement Markings– San Diego County, CA and Sacramento, CA

Dear MUTCD Team:

The California Department of Transportation (Caltrans) would like to request to experiment and research a bi-directional pavement marking called LaneAlert 2X Bi-Directional Pavement Marking from PPP Inc. The bidirectional pavement treatment is as a non-standard/new traffic control device and the research will determine its effectiveness in improving safety, primarily at reducing or preventing wrong way entry at select freeway offramps. The comprehensive work plan discussed below has been put together to accomplish this task. A request to experiment was submitted to the California Traffic Control Devices Committee at their January 31, 2019 meeting in Sacramento, CA, see attachment 1. The Committee voted unanimously to approve the request to experiment and the request to the Federal MUTCD committee for experimentation.

BACKGROUND

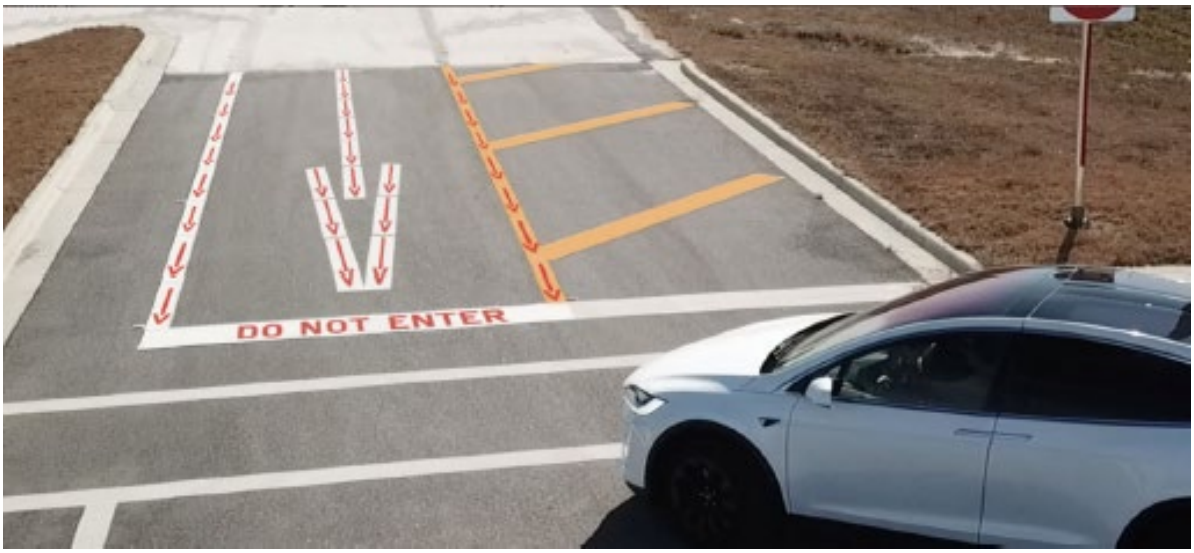
On January 31, 2019 the California Traffic Control Devices Committee (CTCDC) approved the Caltrans District 11 request for permission to experiment with LaneAlert 2X Bi-Directional Pavement Marking from PPP Inc.

Previous enhancements Caltrans has experimented with, red on backside pavement markings and LED bordered flashing WRONG WAY package signs have been successful in reducing reported wrong way incidents on Route 15, and the CTCDC approved use of red-on-backside retroreflective pavement markers a little over a year after the initial study started. These treatments are now part of Caltrans Standard Plans for pavement delineation on ramps and freeways.

A recently developed product called LaneAlert 2x™, that was not available when the original pilot project was initiated, claims the ability to embed wrong way alert messages in pavement striping that are visible only to motorists travelling in the wrong direction. The vendor for this new innovative technology has approached Caltrans to be the first State to test the product.

The product itself is not patented only the process used for this specific application. So any manufacturer or inventor could establish a process to embed a red message or symbol visible to only a wrong way driver.

An installation on a North Carolina Toll Road is shown below.



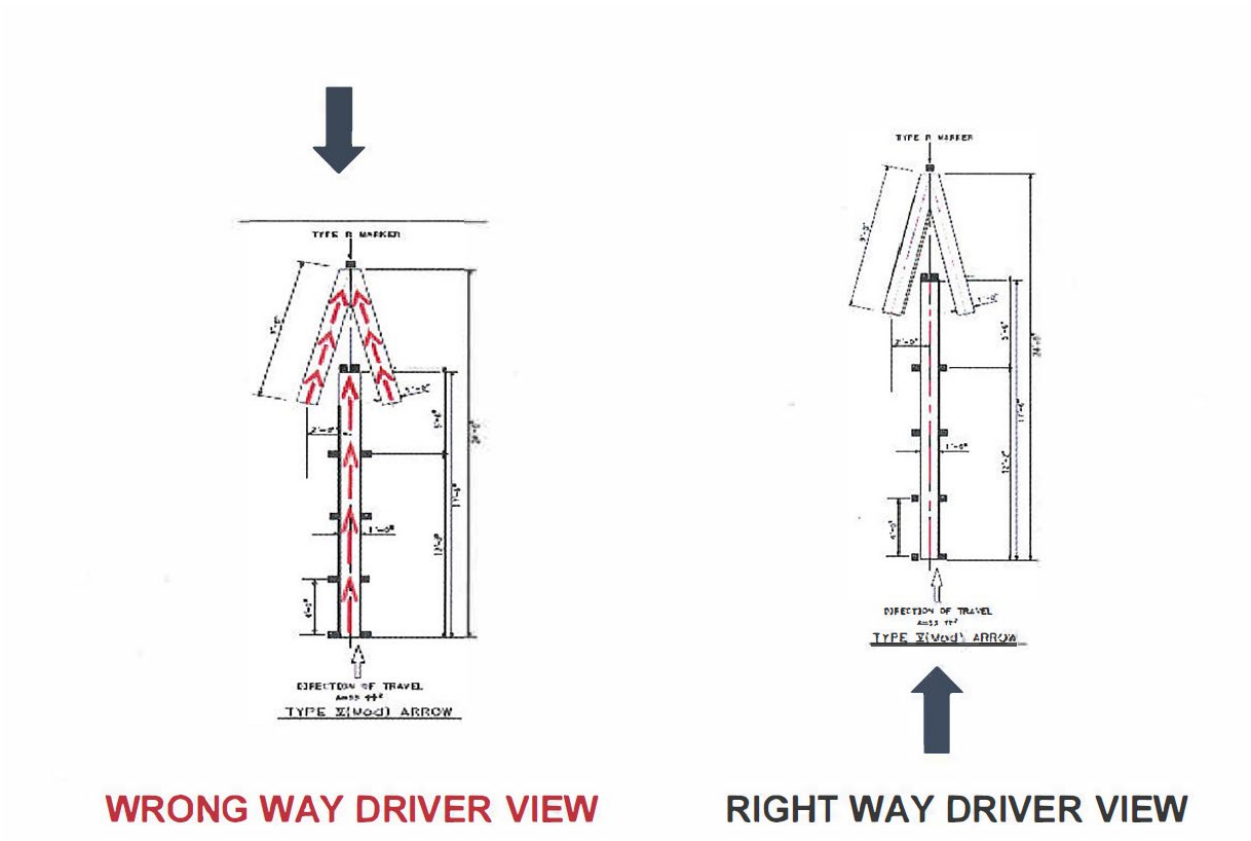
Caltrans would like to evaluate this product to quantify, the potential of this product to reduce the number of instances of wrong way driving on state highways as well as durability and visibility. In addition; the economic and operational feasibility of statewide application would be evaluated. This opportunity would continue Caltrans efforts to further reduce wrong way incidents, using thermoplastic material we already use on our roadways and imprinting a bidirectional message or symbol within the thermoplastic marking that may only be viewed by a wrong way driver.

DESCRIPTION AND PROPOSAL

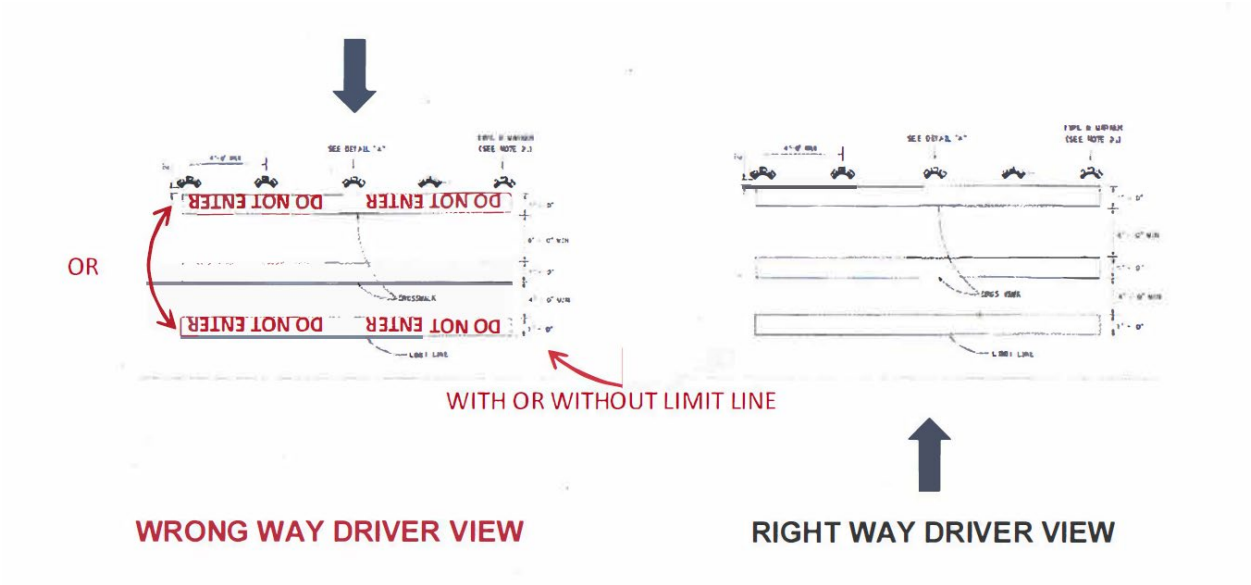
Caltrans proposes to install LaneAlert 2x™ displaying a warning message or symbol to a driver approaching the reflective pavement marking or striping from the wrong direction. The number of ramps where this treatment would be installed is approximately 40 between two Caltrans districts.

The message or symbol will be very similar to standard wrong-way marking dimensions. Below is a sample of the type of markings that will be used for this product evaluation:

1. Type V Arrow made up of 12in wide panels. (12panels W12in x D36in)
   a. Wrong way direction will include a white retroreflective background and 2 miniaturized scaled Red Type V Arrows per panel.
   b. Right way direction will include a white retroreflective with no additional markings.



2. One or more of the following in various combinations may be applied:
   a. W144in x D12in Limit Line made up of 24in or 36in wide panels with
      i. Wrong way direction will include a white retroreflective background, the RED words "DO NOT ENTER", with or without two Red International Do Not Enter symbols. One on each side of the text.
      ii. Right way direction will include a white retroreflective with no additional markings.
   b. One W24in x 0120in Continental Crosswalk Bar (ladder) with Type V arrows, made up of W24in x D24in or D36in panels with
      i. Wrong way direction will include a white retroreflective background and 1 fitted scaled Red Type V Arrow per panel.
      ii. Right way direction will include a white retroreflective with no additional markings.
   c. One standard crosswalk marking with a limit line.
      i. Wrong way direction will include a white retroreflective background and a Red International Do Not Enter symbol imprinted on the limit line
      ii. Right way direction will include a white retroreflective limit line with no additional markings.



3. One W6in x D360in White Lane Line made up of W6in x D36in panels. (10 panels)
   a. Wrong way direction will include a white retroreflective background and 2 miniaturized scaled Red Type V Arrows per panel.
   b. Right way direction will include a white retroreflective stripe with no additional markings.

4. One W6in x D360in Yellow Lane Line made up of W6in x D36in panels. (10panels)
   a. Wrong way direction will include a Yellow retroreflective background and 2 miniaturized scaled Red Type V Arrows per panel.
   b. Right way direction will include a Yellow retroreflective with no additional markings.

Figure 1, shows a typical marking scenario with the LaneAlert 2x™ product for an exit ramp, such as the DAR shown.

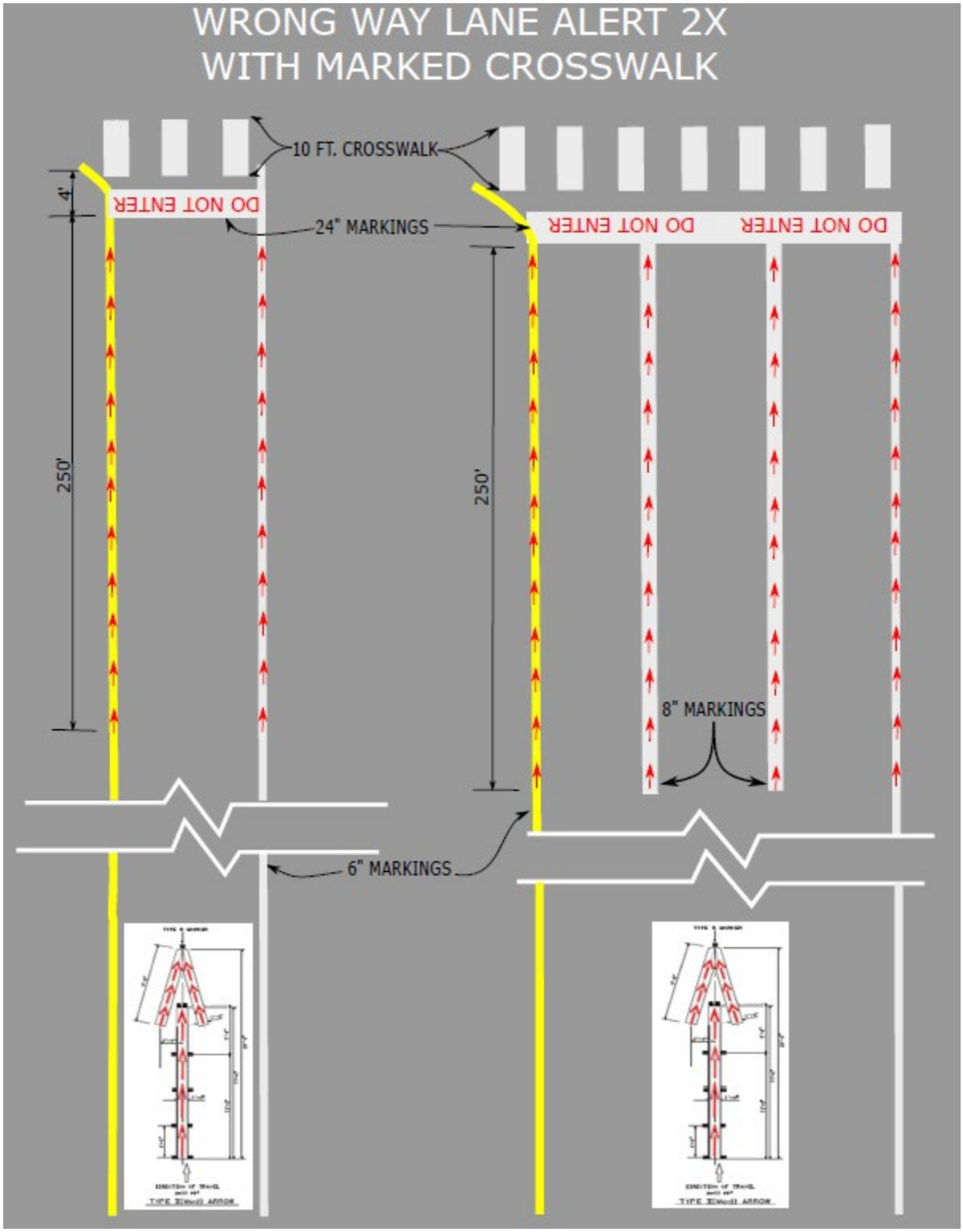


Figure 1 - Typical LaneAlert2X Enhancements to ramps and DAR's

Caltrans District 11 has obtained a contract with Caltrans Office of Safety Innovation and Cooperative Research to assist in the evaluation of these treatments for exit ramps and the production of a report at the end of the study period to document the success or failure of the proposed treatments.

The study will likely be a minimum of one year up to three years, and the number of ramps that will receive the various new enhancements will be approximately 40 between the two Districts. Locations were selected based on data received from the California Highway Patrol's Computer Aided Dispatch system which contained locations of multiple Wrong Way driver entries in 2018. Many of the selected ramps had 5 or more reported wrong way entries within the 2018 period alone.

After the one to three-year period, Caltrans District 3 and 11 will provide a report to the CTCDC to determine if an adequate assessment has been made of the product, or if more time is needed to evaluate the product.

As part of the initial evaluation of the product, the vendor installed two sets of their product markings at two Caltrans locations. One was at the San Diego District Office, the other was at the Crash Testing Facility in West Sacramento.

A sample of those installations is shown in the Wrong Way LaneAlert2X Pilot photos below.

OBJECTIVE

The objective of the experiment is to determine the effectiveness of the experimental bi-directional pavement markings on preventing wrong way entry onto freeways with markings that provide a new way to convey the WRONG WAY DO NOT ENTER message placed clearly in the drivers line of sight along with the red arrows along the lane line and edge lines of the ramps that may be more apparent to a wrong way driver as well.

EXPERIMENT SCHEDULE

- Installation of short demo sections – October 2018
- The installation of the bi-directional pavement markings on 40 ramps in San Diego and Sacramento Counties based on the attached configurations approved by the CTCDC between December 2019 and July 2020
- Experimental Period Evaluation – Evaluation will begin for a period of one year from the date the product is installed on a particular ramp. The last ramps would have the material applied by July 2020. The evaluation period would be until around July 2021 minimum through July 2023.
- Evaluation of Results – September 2021 or September 2023.

EVALUATION PROCEDURES

Caltrans District 11 requests that the FHWA approve the preliminary evaluation plan outlined below.

1) Installation Documentation - to be prepared by Caltrans personnel.
2) Maintenance Recording - to be performed throughout the life of the experimentation period. A separate maintenance log sheet will be created for each site. Periodic inspections will be performed and logged by Caltrans Maintenance personnel.
3) Field observations will be performed to determine the effectiveness of the operation. Video and photographs will be used to help document the success or failure of the treatment using cameras mounted at some ramps and reported wrong way drivers from data received through the California Highway Patrol Computer Aided Dispatch system for up to a 3 year before and after period. Measures of effectiveness and acceptance before, during, and after the testing period may include, but are not limited to, the following actions:

    - Evaluate vehicular self-corrections
    - Evaluate increase or decrease in reported wrong way drivers at selected ramps
    - Evaluate the product durability at set periods throughout the evaluation process.
4) Data driven – comparing before and after reported wrong way driver activity at ramps were Treatment. The before and after data will be similar to the study period, so that if the experiment lasts three years, equivalent before and after data will be used.

If you have any questions or comments, please feel free to contact me at 916-654-5975.

Sincerely,

TROY BUCKO
Lead Project Engineer
Division of Traffic Operations
Caltrans HQ