

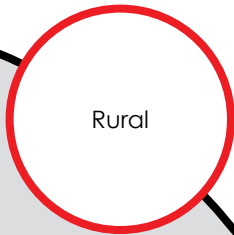


Caltrans Division of Research,  
Innovation and System Information

# Research



# Results



Rural

## AUGUST 2019

**Project Title:**

Advanced Camera Lowering Device  
for ITS Field Maintenance

**Task Number:** 3213

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## Maintaining Caltrans' CCTV Intelligent Transportation System Assets

Documenting the installation, training, and performance of camera lowering devices in association with Caltrans' Maintenance and Transportation Management Center personnel.

### WHAT IS THE NEED?

To satisfy California Department of Transportation (Caltrans) 2020 Intelligent Transportation System (ITS) field equipment performance goals and be consistent with Moving Ahead Progress 21 performance management targets, Caltrans is deploying an increasing number of Closed-Circuit TV (CCTV) cameras to monitor traffic and conditions on California's roadways.

These CCTV cameras are typically mounted along the highway on top of high poles which need to be accessed periodically for maintenance to keep these sophisticated systems operational. Many sites where Caltrans operates camera systems are difficult to access due to traffic hazards, roadside obstacles, and pole heights out of the reach of standard Caltrans man-lift trucks.

These challenging sites require additional time, cost, and exposure to unsafe conditions, which consequently contributes to delayed or deferred camera maintenance and repairs. To facilitate access to these problematic camera sites, Caltrans is expanding their application of pole-mounted camera lowering device (CLD) systems.

### WHAT WAS OUR GOAL?

To procure, install, and evaluate the performance aspects of both the internal and external type CLD systems. The researchers did not evaluate the structural integrity or structural acceptability of the CCTV lowering device, pole foundation bolt hole pattern, or external mount device for Caltrans' use



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integrated and efficient transportation  
system to enhance California's  
economy and livability.

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## WHAT DID WE DO?

The research team specifically aimed to evaluate both an integrated pole system, including internal lowering device, and an external mount lowering device for retrofit attachment to an existing pole. The focus of the evaluation determined if one or both systems provided a viable, cost-effective, and maintainable solution for Caltrans' CCTV lowering needs.

Some of the key activities include:

- Documented the installation of both the internal-type integrated pole and external-type add-on CLD systems.
- Documented the installation of a Caltrans standard Halo-style CLD system.
- Investigated how the MG2 CLD devices performed under various conditions.
- Observed and assessed the necessary maintenance demands of the CLD devices, including lubrication and cleaning practices; and determined if there were any significant maintenance differences between the two device designs.
- Documented the Caltrans Maintenance crews' field use of both the internal and external CLDs.
- Investigated the disconnect design performance characteristics.
- Determined whether any of the CLD designs require specific pole accommodations for the device to operate normally.

## WHAT WAS THE OUTCOME?

The field trials of the both types of CLD systems were successful and no negative issues were observed or experienced. The systems operated as required, simple to operate, and trouble-free over the duration of this research study.

The camera pendant can be lowered to the ground or raised up to latch in less than two minutes by hand with minimal effort. An internal

electric winch or the drive socket attachment included with the detachable winch may be necessary for high-mast applications, but the poles in this study were 50 feet or less, which made winching by hand very appropriate.

It may be useful to investigate CLD devices in the field over a longer period and potentially determine a value for an average service life. It would also be beneficial to examine CLD systems that have seen many years of service and/or are in service in harsh climates, such as saltwater environments, to better understand how these CLD systems perform as the mechanisms degrade and which parts are most prone to failure.

A detailed cost-benefit study could be developed which examines the characteristics of CCTV site locations; and determines the type of sites that justify the additional expense for CLD systems. Some expected factors would include access, traffic, pole height, space, infrastructure, and legacy equipment. This study could ultimately serve as a guide for Caltrans to refer to when determining and justifying which site locations would benefit from CLD system deployment.

## WHAT IS THE BENEFIT?

The expected benefit of this research is to provide Caltrans with an expanded selection of pole-mounted CLD product options to choose from when specifying projects. These additional devices may prove to be more cost-effective, provide additional performance benefits, and/or require less effort to maintain in the field.

The supplemental devices will be studied and evaluated with respect to consideration for addition to Caltrans Standard Plans and Specifications. Successful systems could significantly ease the maintenance burden for high pole-mounted CCTV cameras while avoiding the known issues of the existing Halo-style CLD systems currently used by Caltrans.

## LEARN MORE

The final report can be found at:  
<https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/final-reports/ca19-3213-final-report-a11y.pdf>

## IMAGES



Picture 1: External-Type CLD System, US-50 at El Dorado Hills Boulevard



Picture 2: Internal-Type CLD System, US-50 at Meyers



Picture 3: Lowering the Camera Action Shot

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