



**COLORADO**

**Department of Transportation**

Division of Maintenance & Operations

## Red Light Running Cameras Implementation Guidelines

Colorado Revised Statutes C.R.S. 42-4-110.5 identifies the use of automated vehicle identification systems as a statewide concern and an area in which uniform state standards are necessary. This document serves as the Colorado Department of Transportation's (CDOT's) guidance for the implementation of red light running (RLR) cameras on highway facilities owned by CDOT. The purpose of this document is to provide uniform and consistent guidance for CDOT Regions and local agencies (operating traffic signals under SB 8 maintenance contracts) for the implementation of RLR cameras at signalized intersections. It also provides information on RLR camera installation permit application procedure and required documentation.

The initial step in determining whether a RLR camera system, or any candidate countermeasure, needs to be deployed is to identify whether red light running and resulting crash problems exist at the intersection. Red light running and associated crashes may occur from a number of contributing factors and may be addressed by a variety of countermeasures such as engineering improvements, enhanced driver and public education, and increased enforcement. A red light running issue at any intersection should be investigated, and the feasibility of all alternative countermeasures, including RLR camera systems, should be evaluated. A properly applied red light running camera system is one of the countermeasures that can be effective to mitigate red light safety problems at signalized intersections. When considering RLR cameras, it is critical to ensure that there are no other contributing factors, such as improperly timed traffic signals or limited sight distance, since these factors may suggest countermeasures other than RLR camera enforcement. Therefore, RLR cameras should not be installed until the problem location has been studied and other countermeasures have been implemented that did not correct the problem as described in the FHWA/ITE publication "*Making Intersections Safer: A Toolbox of Engineering Countermeasures to Reduce Red Light Running*" (FHWA/ITE 2003).

It is important to perform the study to identify potential factors that may be contributing to red light violations and potential countermeasures that may be implemented. If one or more countermeasures are deemed feasible, the local agency should work with CDOT Region Traffic Operations Engineer to implement them and evaluate their progress. Engineering improvements/countermeasures should be the responsibility of local agency for all SB 8 contracts. The countermeasures should be used for 6-18 months before any evaluation is made to quantify their effect on red light running. If the countermeasures have succeeded in reducing or resolving the red light running problem, then there is no need to consider RLR cameras. However, if all countermeasures have failed to solve the red light running problem or if no countermeasures are found feasible based on engineering study and analysis, then RLR cameras may be considered and the necessary application and approval process should be followed. Refer to **Appendix A** for a decision tree for applying RLR camera system.

Agencies interested in implementing RLR camera installation should provide CDOT Region Traffic Engineer the following documents at a minimum:

- A statement explaining why RLR cameras are proposed at a specific intersection
- A completed Intersection Field Inspection Form (**Appendix B**)



- A minimum of (2) years of recent intersection related crash data
  - Red light running related crash data/rate (if available)
  - Assurance that individual reports were reviewed
  - Assurance that all crashes have been properly characterized
  - Independent review of crash data by CDOT Staff Traffic Branch
- A list of countermeasures attempted at the intersection, if any, and documentation of how these previously implemented countermeasures affected red light running violations
- If countermeasures have not yet been attempted or no countermeasures are found feasible, the study should document why countermeasures have not been considered
- Documentation of the current clearance intervals (yellow and all-red), whether the signal is coordinated with other signals along the corridor, and the current condition of other safety features (i.e. lane markings, median control, speed limits, signing, lighting, etc.)
- A calculation of proposed clearance times, and a description of the lanes to be RLR camera enforced
- Optional supplemental information
  - Red light running violations/rate
  - Any additional information in support of the RLR camera implementation

The agency requesting the RLR camera installation shall be responsible for obtaining any required electrical power service to the RLR camera equipment. The electrical supply shall be separately metered from CDOT electric supply. A separate service meter and disconnect is required for the power to RLC camera installation that can be accessed and operated by CDOT personnel. The electrical service meter shall not be mounted on CDOT poles and structures. The method of providing electric service shall be approved by CDOT. The requesting agency is required to obtain all necessary permits.

If the application is approved by CDOT Region Traffic Engineer, the local agency must apply for and complete a no-cost **Special Use Permit** through the Region Permit office. The installation and administration of RLR camera shall be the responsibility of the local agency including, but not limited to, citations, adjudications, mailings, etc. The requesting agency shall also be responsible for any ongoing maintenance costs, repairs and eventual replacement of the RLC camera installations.

The implementation of RLR camera system should be in accordance with FHWA publication entitled "Red Light Camera Systems Operational Guidelines" (FHWA/NHTSA 2005). After the RLR camera system installation is complete, the local agency should be responsible for providing crash data/analysis to the region traffic section on an annual basis. Should operational or safety issues arise resulting from the installation of a RLR camera system, the CDOT Region Traffic Engineer reserves the right to remove all equipment at the expense of the local agency. Please address any questions regarding these guidelines to the CDOT Region Traffic Engineer.



## CDOT Utility Permit Program Office Contacts:

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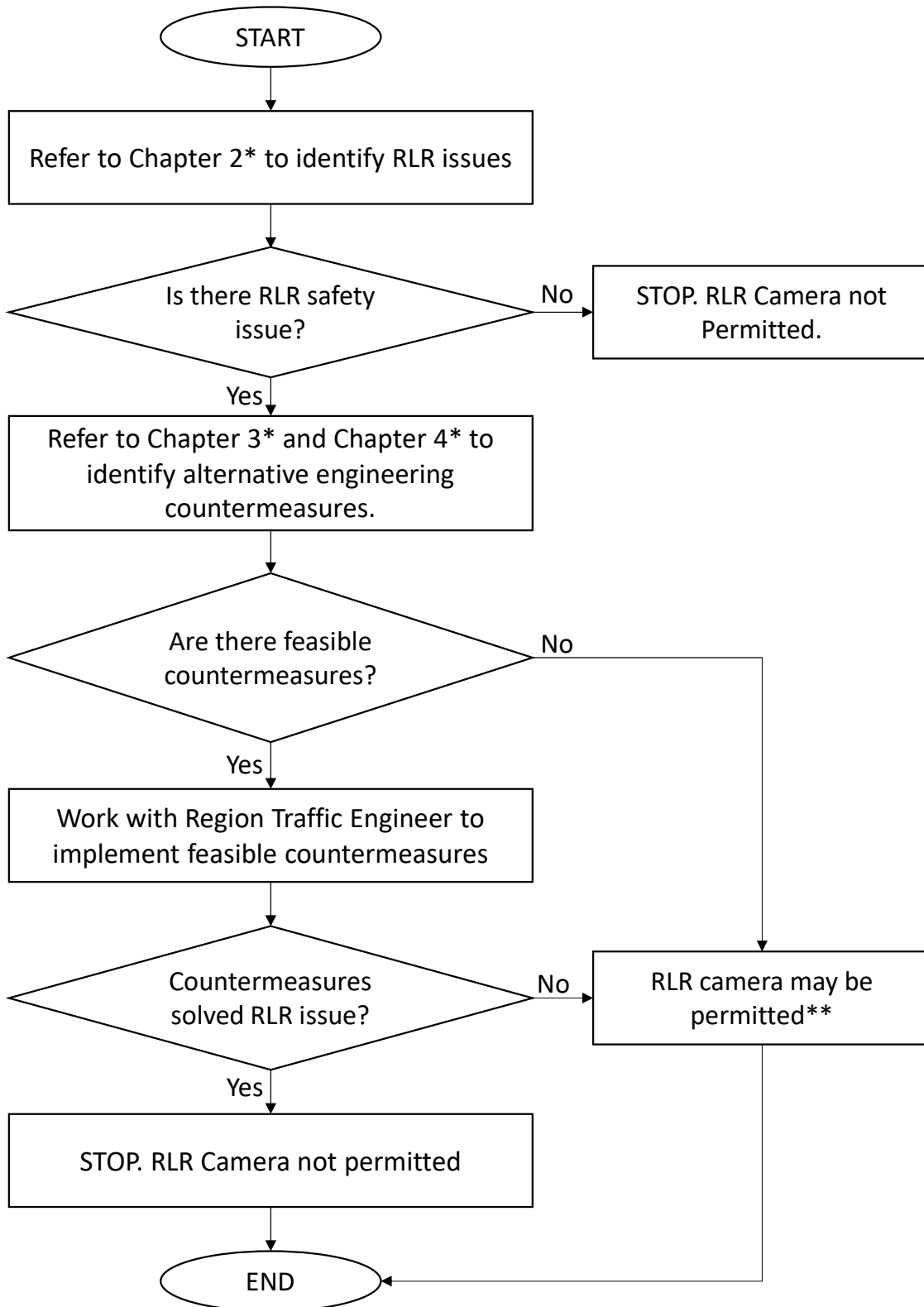
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# APPENDIX A

## DECISION TREE FOR APPLYING RED LIGHT RUNNING CAMERA SYSTEM



\*Making Intersections Safer: A Toolbox of Engineering Countermeasures to Reduce Red-light Running  
- An Informational Report (FHWA/NHTSA 2005)

\*\*Refer to CDOT guidelines for application and approval process

# INTERSECTION FIELD INSPECTION FORM

## LOCATION INFORMATION

Intersection Identification: \_\_\_\_\_ with \_\_\_\_\_

Approach Name: \_\_\_\_\_ Direction Heading: \_\_\_\_\_

### PART 1. CHECK SIGNAL VISIBILITY

Type of Signal Mounting: **Span Wire Mast Arm Pole Structure** Sight Distance to the Signal: \_\_\_\_\_ feet

Requires Advance Warning Sign? **Y N** Advance Signal Warning Sign Present: **Y N**

Is anything blocking the view of the signals? **Y N** If yes, describe \_\_\_\_\_

Can signal faces on other approaches be seen? **Y N** If yes, do these signals have visors, shields, or programmable lenses? **Y N**

### PART 2. CHECK SIGNAL CONSPICUITY

Could visual clutter detract from the signal? **Y N**

Are the signal indications confusing? **Y N**

If yes, explain: \_\_\_\_\_

Are backplates present? **Y N**

Are backplates necessary? **Y N**

Are other glare-reducing steps needed? **Y N**

Signal lens type: **Incandescent LEDs**

Signal Lens Size Adequate?:

Red signal lens size: **8 inch 12 inch**

Distance from stop line to signal: \_\_\_\_\_ feet

Near side signal? **Y N**

Is existing size adequate? **Y N**

Number of Signal Heads Adequate? **Y N**

Total number of signal heads for major movement: \_\_\_\_\_

Total number of lanes for major movement: \_\_\_\_\_

Is existing number adequate? **Y N**

Signal Heads Placement Adequate? **Y N**

### PART 3. CHECK SIGNAL CONTROL PARAMETERS

Grade (as decimal)  $g =$  \_\_\_\_\_ (uphill is positive)

Approach speed  $V =$  \_\_\_\_\_ mph

Cross street width  $W =$  \_\_\_\_\_ feet

Calculate the needed change period ( $CP$ ) for this approach using agency practice or the following equation:

$$CP = 1.0 + \frac{\overbrace{1.47 * V}^{\text{Yellow}}}{(20 + 64.4g)} + \frac{\overbrace{W + 20}^{\text{All-red}}}{1.47 * V}$$

	Actual Value	Calculated Value	Is Existing Adequate?	
Yellow Interval	_____	_____	<b>Y</b>	<b>N</b>
All Red Interval	_____	_____	<b>Y</b>	<b>N</b>

### PART 4. CHECK OTHER FACTORS

Is horizontal location adequate? **Y N** Pavement condition on approach: **Adequate Polished Severely Rutted**

Should signal warranting study be conducted? **Y N** Other concerns: \_\_\_\_\_

### PART 5. IDENTIFY PROMISING COUNTERMEASURES

#### Visibility Deficiency

#### Conspicuity Deficiency

#### Signal Timing Operation Deficiency

- \_\_\_\_\_ Install additional signals on near side
- \_\_\_\_\_ Change signal mounting
- \_\_\_\_\_ Install SIGNAL AHEAD sign
- \_\_\_\_\_ Install Advance Warning Flashers
- \_\_\_\_\_ Remove/relocate sight obstruction
- \_\_\_\_\_ Install programmable lenses
- \_\_\_\_\_ Install shields and visors
- \_\_\_\_\_ Other \_\_\_\_\_

- \_\_\_\_\_ Add signals to achieve one per lane
- \_\_\_\_\_ Replace with LED lens type
- \_\_\_\_\_ Replace with 12" signal head
- \_\_\_\_\_ Install double red signal
- \_\_\_\_\_ Install/enhance backplates
- \_\_\_\_\_ Install rumble strips on approach
- \_\_\_\_\_ Install near side signal

- \_\_\_\_\_ Change yellow interval
- \_\_\_\_\_ Add/change all-red interval

#### Other Measures

- \_\_\_\_\_ Determine if signal is warranted
- \_\_\_\_\_ Consider roundabout or innovative design
- \_\_\_\_\_ Improve pavement condition

Inspection By: \_\_\_\_\_

Date: \_\_\_\_\_