



Traffic Control Device Application Guidelines

Office of Traffic & Safety

Application Guideline No.

11 – X10

Provisions Regarding the Installation of Red Light Cameras on State Highways or at Maryland Department of Transportation State Highway Administration Signals

July 30, 2018

The Maryland Department of Transportation State Highway Administration (MDOT SHA) and the Local Jurisdiction(s) find it mutually desirable to improve safety at MDOT SHA owned signalized intersections where red light running may be a significant traffic safety problem. The ideal approach to solving these problems is the 3 E Process – Education, Engineering, and Enforcement. The operation of automated traffic signal violation detection equipment of red light cameras (RLC) can be a component of this process where conventional enforcement techniques are not feasible or have been ineffective. However, so as to avoid the aura of over-regulation, the overuse of these systems should be avoided – RLC should be installed only after other means have failed to reduce the number of red light violations that contribute to related crashes. Enhanced traffic safety, not revenue generation, must be the principle aim.

When a Local Jurisdiction has justified the installation of a RLC based on a safety study as described in the attached study outline and checklist, certain design procedures need to be followed. The implementation of the RLC Program must be augmented with a continuous ongoing evaluation program to monitor and determine its effectiveness, and to maintain the credibility of the program. Results of these evaluations should identify the successes and limitations of the program and thus aid in future decision making. Except as otherwise specified, these procedures and responsibilities apply to locations where RLC's are to be installed, entirely or in-part, on MDOT SHA rights-of-way and/or to be connected to or operated in conjunction with MDOT SHA owned traffic signals.

Subject to MDOT SHA's written approval and in compliance with these provisions, MDOT SHA will allow the Local Jurisdictions to install, maintain, revise, repair and operate RLC's on MDOT SHA rights-of-way at approved locations. MDOT SHA will seek cost recovery for each approved location for related expenses at new and substantially revised camera locations. MDOT SHA reserves the right to terminate any approved permits/design requests (DRs) for existing RLC locations after the first-year anniversary period of the site being activated unless justification from the Local Jurisdiction is provided for requesting an extension. MDOT SHA

may require a safety study from the Local Jurisdiction if an extension is requested. MDOT SHA reserves the right to revise these provisions including remuneration. If a permit/DR is terminated and any of these provisions or the remuneration is modified, MDOT SHA will notify the local Jurisdiction of such changes.

These procedures and the respective responsibilities of MDOT SHA and the Local Jurisdiction (including contractors) are set forth in the following:

1. The request for MDOT SHA approval of new or revised camera locations or for in-kind repair is to be submitted by the Local Jurisdiction to the Assistant District Engineer – Traffic (ADE-T) for the District in which the work would be conducted. The Local Jurisdiction shall complete a DR and supply all supporting data providing the need for and/or modification to the RLC to the ADE-T. The District contact information along with the Counties covered by that District is listed in the table below.
 - a. The supporting data for new RLC locations shall include:
 - i. Specific location (intersection and approach(es)/movement(s) to be monitored) of each RLC (monitoring of right-turn only movements will not be permitted).
 - ii. Documented evidence that red light running creates a significant traffic safety problem.
 - iii. The most recent three-year police-reported crash data.
 - iv. Violation data including lapsed time from beginning of red and violation (0.5 seconds or greater).
 - v. Statement of agreement from local county/city government, if possible.
 - vi. Traffic Signal Timing Charts for traffic signals not maintained by MDOT SHA. If this information is not available to the Local Jurisdiction, a statement of this should be included with the request to MDOT SHA, and MDOT SHA will inform the Local Jurisdiction of the responsible agency. Under these circumstances, the Local Jurisdiction can provide the Charts as an addendum to the request, but MDOT SHA review will not begin until this information is provided.
 - b. The supporting data for upgrades to existing RLC locations shall include:
 - i. The most recent three-year police-reported crash data.
 - ii. Violation data including lapsed time from beginning of red and violation (0.5 seconds or greater).
 - iii. Traffic Signal Timing Charts for traffic signals not maintained by MDOT SHA.



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iv. Annual Report (See item number 22 of this document)

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| District 1 | Dorchester, Somerset, Wicomico, and Worcester Counties | Attn: ADE-T 660 West Road Post Office Box 2679 Salisbury MD 21802 | 410-677-4040 |
| District 2 | Caroline, Cecil, Kent, Queen Anne's, and Talbot Counties | Attn: ADE-T 615 Morgnec Road Post Office Box 299 Chestertown MD 21620 | 410-810-3240 |
| District 3 | Montgomery and Prince George's Counties | Attn: ADE-T 9300 Kenilworth Avenue Greenbelt MD 20770 | 301-513-7358 |
| District 4 | Baltimore and Harford Counties | Attn: ADE-T 320 Warren Road Hunt Valley MD 21030 | 410-321-2780 |
| District 5 | Anne Arundel, Calvert, Charles, and St. Mary's Counties | Attn: ADE-T 138 Defense Highway Annapolis MD 21401 | 410-841-1003 |
| District 6 | Allegany, Garrett, and Washington Counties | Attn: ADE-T 1251 Vocke Road LaVale MD 21502 | 301-729-8444 |
| District 7 | Carroll, Frederick, and Howard Counties | Attn: ADE-T 5111 Buckeystown Pike Frederick MD 21701 | 301-624-8141 |

2. The ADE-T along with representatives from the Office of Traffic and Safety (OTS) Traffic Development and Support Division (TDSD) will review each submitted location to ascertain if any engineering improvements likely would alleviate the red light running problem or if any planned improvements would affect the installation. The review will cover signal conspicuity (line of sight, etc.), phasing, system needs, timing (including change and clearance intervals), signing, pavement markings and confirm that the vehicle detectors are operating. Should the District and OTS find any signal malfunctions during their review of the signal, including vehicle detectors that are not functioning properly, the District shall prepare and submit a DR to OTS TDSD. The noted malfunctions must be repaired and the number of red light violations must be re-evaluated before a DR is submitted for a red light camera installation. Should the signal be operating properly and there are no other engineering improvements that would reduce

the red light running problem, the ADE-T will submit a DR for the requested locations. For each location, the completed “District Checklist for the Installation of RLC on State Highways or at MDOT SHA Signals,” the name, address and phone number of the Local Jurisdiction contact and their contractor, and any recommendations/comments are to be attached to the DR.

3. OOTS TDSD will process the DR, and upon its approval by the Director of the OOTS, or his representative, will forward the DR to the OOTS Traffic Engineering Design Division (TEDD) along with the name, address and phone number of the Local Jurisdiction contact and their contractor. OOTS TEDD will then distribute the approved DR, and at that time, the Local Jurisdiction will submit ten paper copies of the formal plans for review. All questions related to the design of RLC Systems shall be handled by the OOTS TEDD Division Chief at 410-787-4027.
 - a. All plans shall be designed by a consultant with experience in traffic engineering principles and design.
 - b. All plans submitted shall follow current MDOT SHA CADD Standards.
 - c. When required by the RLC installation, a plan which includes existing field measured lighting levels shall be submitted with the review package.
 - d. If modifications are necessary to the existing intersection lighting, a set of plans which include the proposed modifications to the lighting and point by point lighting calculations shall be submitted.
 - e. Application for utility installation shall be the responsibility of the RLC design consultant or Local Jurisdiction.
4. OOTS TEDD will follow the MDOT SHA final review process in reviewing the proposed design. The review process will be completed within 15 business days. After reviewing the plans, OOTS TEDD will contact the RLC design consultant and provide them with any comments. The RLC design consultant will make changes and resubmit the plans back to OOTS TEDD for approval. This submittal shall include one set of mylars and electronic files in MDOT SHA format.
5. The OOTS Contracts and Finance Division (CFD) will send a letter to the Local Jurisdiction advising them that their plans were approved and will request payment from the Local Jurisdiction. The Local Jurisdiction will be required to submit payment to the OOTS CFD prior to the release of the approved plans. Should the Local Jurisdiction have any questions regarding the remuneration, please contact the OOTS CFD Capital Programs Coordinator at 410-787-7635. Once the payment is received, OOTS CFD will release the plans to the Local Jurisdiction and make the final distribution of the plans.



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6. The Local Jurisdictions shall design, install, and remove each RLC in order to meet or exceed standards established by the following:
 - a. The latest edition of the Maryland Manual on Uniform Traffic Control Devices (Md MUTCD).
 - b. The latest revision of the Standard Specifications for Construction and Materials.
 - c. The latest revision of the Book of Standards for Highways and Incidental Structures.
 - d. The MDOT SHA Traffic Control Devices Design Manual.
 - e. AASHTO's A Policy on Geometric Design of Highways and Streets.
 - f. The AASHTO Roadside Design Guide.
 - g. The High Voltage Line Act (Articles 89, Section 58 to 63, inclusive, of the *Annotated Code of Maryland*)
 - h. The National Electrical Code and the National Electrical Safety Code.
 - i. The Illuminating Engineering Society of North America's American National Standard Practice for Roadway Lighting ANSI/IESNA RP-8-00; and
 - j. All other applicable codes.
7. The design and installation of the RLC system may utilize MDOT SHA facilities, if all the wires associated with the RLC system are placed in a red protective sleeve. The protective sleeve shall separate RLC wires from existing MDOT SHA signal wires at all times, including but not limited to hand holes, conduit, signal structures and span wire.
8. If the existing conduits or hand holes are over capacity, the design consultant will be required to install additional conduits or hand holes as necessary.
9. The Local Jurisdiction shall be required to follow current MDOT SHA lighting standards if the RLC system will be dependent on existing intersection lighting. All requests for modifying existing intersection lighting shall be reviewed and approved by MDOT SHA.
10. If the RLC system will be dependent on existing intersection lighting, photometric data for roadway luminaires shall be submitted. Point by point lighting calculations shall be provided. The printouts shall show predicted horizontal foot-candles and veiling luminance ratios for the roadway. All calculated lighting levels for roadway lighting shall be not less than the levels specified in I.E.S.N.A. RP-8-00 American National Standard Practice for Roadway Lighting.
11. Upon receipt of the approved plans from the MDOT SHA and commencement of construction, the Local Jurisdiction shall notify the following agencies at least 72 hours prior to beginning the camera installation/modification process:

| Agency | Phone Number | Reason for Contacting |
|--|-----------------------------------|--|
| Traffic Control Device Inspection Section (TCDIS) | 410-787-7630 Fax: 410-582-5610 | Construction Stakeout/Inspection |
| * The RLC Contractor shall notify TCDIS by 3:00 pm on the day prior to installation of locations where work will be conducted. | | |
| Miss Utility | 1-800-257-7777 | Marking of Underground Utilities |
| Traffic Operations Division (TOD) – Signal Shop | 410-787-7650 | Marking of MDOT SHA-Owned Signal Equipment |
| Resident Maintenance Engineer | See Table on Page Two | Marking of MDOT SHA-Owned Lighting Equipment |
| CHART | 410-582-5605 | Marking of MDOT SHA-Owned ITS Equipment |
| Appropriate SHA District Office | See Table on Page Two | Lane Closure Permits |

12. Upon receipt of the approved plans and following advance notice to the above agencies, the MDOT SHA will allow the Local Jurisdiction to install/modify equipment pertaining to their RLC system on MDOT SHA right-of-way at no cost to MDOT SHA.
13. The contractor shall conform to the following requirements for obtaining power, communication and signal outputs from the controllers at no cost to MDOT SHA:
 - a. Power Feed
 - i. The Local Jurisdiction shall install a metered service pedestal (if one does not exist) for the existing traffic signal cabinet and obtain power from this location for its RLC system. The engineering and inspection fee will not be waived if a new metered service pedestal is installed.
 - ii. The Local Jurisdiction is responsible for coordination of the new power feed to the proposed metered service pedestal with the appropriate power company.
 - iii. The installation and all costs associated with the installation of the proposed power feed will be the responsibility of the Local Jurisdiction.
 - iv. The Local Jurisdiction is responsible for providing conduit and electrical cables (per MDOT SHA Standards) from the metered service pedestal to the signal cabinet.



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For intersections where an existing RLC is being reconstructed, MDOT SHA may provide temporary power for the camera from the existing electrical service until a permanent connection is provided by the utility company. The Local Jurisdiction shall submit a request for temporary power to OOTS Traffic Control Device Inspection Section (TCDIS) and MDOT SHA will review if the current utility service is adequate to support the additional loads. The Local Jurisdiction shall be responsible for all costs associated with the installation of the temporary power feed. At new RLC locations, MDOT SHA will not provide temporary power to the RLC's.

- b. Signal Outputs
 - i. The Local Jurisdiction shall install in-line fuses on all the appropriate signal outputs (red and yellow) from the camera to the signal controller to protect the signal equipment if the RLC is damaged. The fuses must be housed in the breakaway base where the RLC equipment is located.
- c. Grounding
 - i. The Local Jurisdiction shall use a No. 6 A.W.G. Stranded Bare Copper Ground Wire to connect all of its structures to the ground rod located at the metered service pedestal.
- 14. A final inspection will be required for the installation of each RLC location. The Local Jurisdiction shall notify OOTS TCDIS at 410-787-7643 to request a final inspection. OOTS TCDIS requires at least 72 hours before scheduling the final inspection.
- 15. After OOTS TCDIS approves the installation, OOTS TCDIS will contact the appropriate divisions throughout MDOT SHA to activate the RLC. If it is necessary to turn off the signal to make any wiring connections, the Local Jurisdiction will be responsible for providing police for flagging during the signal downtime. The Local Jurisdiction will be responsible for all costs associated with the provided police presence.
- 16. The Local Jurisdiction shall be responsible for the removal of the old electrical service and all old meters and disconnects. The cost of the removal shall be the responsibility of the Local Jurisdiction.

17. If the RLC is to be connected to a traffic signal owned by MDOT SHA and maintained by the Local Jurisdiction in accordance with a separate agreement between MDOT SHA and the Local Jurisdiction, MDOT SHA will allow the Local Jurisdiction to make the wiring connections at no cost to MDOT SHA. The installation needs to have been approved by the OOTS Signal Shop. After the installation is approved, the OOTS Signal Shop will allow the Local Jurisdiction to make the wiring connections. The Local Jurisdiction shall contact the OOTS Signal Shop 72 hours prior to making the wiring connections.
18. MDOT SHA will notify the Local Jurisdiction if any of the camera equipment (including loops) will be impacted by an MDOT SHA construction project. The Local Jurisdiction will be responsible for removing and reinstalling the camera equipment that will be impacted by the construction. If the loops are removed/damaged by the construction project, MDOT SHA will notify the Local Jurisdiction and coordinate with the Local Jurisdiction as to when the loops may be reinstalled. The Local Jurisdiction will be responsible for reinstalling the loops. All costs associated with removing and/or reinstalling all camera equipment (including loops) will be the responsibility of the Local Jurisdiction. Prior to re-installing any equipment (not including loops), the Local Jurisdiction must re-submit their request to the appropriate District office and obtain approval from MDOT SHA to re-install their equipment. For revised camera locations, a DR with supporting documentation must be submitted to MDOT SHA.
19. For malfunctioning of, vandalism to, or crashes into the RLC system or damage by construction, maintenance, lightning storm, or other “acts of nature” to the traffic signal the responsibilities are as follows:
 - a. The Local Jurisdiction shall repair any item associated with RLC system in an expedient manner and if the damage and/or malfunction cannot be expediently repaired the Local Jurisdiction shall immediately notify MDOT SHA. MDOT SHA will then disconnect the camera system from the signal cabinet until the repairs can be made.
 - b. Any damaged traffic signal equipment owned by MDOT SHA, but maintained by the Local Jurisdiction, that is connected to, or associated with, a RLC shall be repaired by the Local Jurisdiction immediately. If the damage and/or malfunction of the MDOT SHA signal equipment is caused by the construction, maintenance, or operation of the red light camera, it shall be repaired by the Local Jurisdiction at the expense of the Local Jurisdiction. If the damage and/or malfunction cannot be expediently repaired, the Local Jurisdiction shall immediately notify MDOT SHA. All repairs to any traffic signal equipment will be at no cost to MDOT SHA.
 - c. Any damaged traffic signal equipment owned and maintained by MDOT SHA that is connected to or associated with a RLC shall be reported immediately to MDOT SHA. If the damage and/or malfunction of the MDOT SHA signal



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equipment is caused by the construction, maintenance, or operation of the RLC, it shall be repaired by the Local Jurisdiction at its expense.

- d. If at any time MDOT SHA Maintenance Forces must respond to a traffic signal where the RLC is damaged or caused damage/malfunction to the traffic signal, MDOT SHA will bill the Local Jurisdiction for the cost of the necessary repairs to the traffic signal. MDOT SHA shall not be obligated to repair the RLC, but may disconnect the signal outputs to the red light camera, if necessary.

20. The Local Jurisdiction shall contact the OOTS Signal Shop whenever they are taking a camera temporarily out of service. The Signal Shop will then disconnect the signal outputs from the signal controller. When the Local Jurisdiction would like to re-activate the camera location, they must contact the OOTS Signal Shop and the wires will be reconnected. If at any time MDOT SHA finds a signal where the signal outputs are still hooked up but the camera is not at the location or active, MDOT SHA will contact the Local Jurisdiction and will disconnect the wires. All costs associated with disconnecting/reconnecting the wires will be billed to the Local Jurisdiction.

21. Should the Local Jurisdiction remove a camera from the intersection, the Local Jurisdiction shall remove all equipment pertaining to that camera system including wiring, poles, foundations, cabinets, etc. at no cost to the MDOT SHA. Should the Local Jurisdiction modify the camera equipment being used, all unused camera equipment including wiring, poles, foundations, cabinets, etc. shall be removed at no cost to the MDOT SHA. All removals shall be done to MDOT SHA Standards. The Local Jurisdiction shall notify OOTS TCDIS prior to removing any equipment.

22. The Local Jurisdiction will collect red light violation data after a camera is installed, on an annual basis, and compare this data with the pre-installation data. These annual reports shall be sent to MDOT SHA. The annual report shall include:
 - a. Location, direction or travel and lanes being monitored.
 - b. Date of RLC activation.
 - c. Three year before and a minimum of one year after crash data.
 - d. The total number of citations recorded for each location.
 - e. Maintenance records including the date last calibrated.
 - f. Citizen's feedback/comments concerning the RLC site.
 - g. Local Jurisdiction contact info (name, phone number, email address, mailing address and fax number).

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23. Questions and comments regarding the RLC Provision Document shall be submitted in writing to the Director, OOTS at the following address:

Maryland State Highway Administration
Office of Traffic and Safety
7491 Connelley Drive
Hanover, MD 21076
Attn: Director's Office