	TRAFFIC CONTROL DEVICE APPLICATION GUIDELINES OFFICE OF TRAFFIC AND SAFETY			
	Issuing Unit TDSO	Application Guideline No. 11-X10	Originally Issued: 4/20/2008	Revision Date: 8/15/2024

GUIDELINES FOR THE INSTALLATION OF RED LIGHT CAMERAS ON STATE HIGHWAYS OR AT STATE HIGHWAY ADMINISTRATION SIGNALS

BACKGROUND AND PURPOSE

Purpose

The purpose of this guideline is to outline the process and standards for local jurisdictions to submit and the State Highway Administration (SHA) to review requests for the installation, modification, and repair of red-light cameras (RLCs) on State highways and at traffic signals owned or maintained by SHA. RLCs can be an effective strategy to prevent fatal or serious-injury crashes at signalized intersections. This guideline ensures that the installation of RLCs at traffic signals owned or maintained by the SHA is a data-driven process and that the installation is designed to improve safety and prevent fatal or serious-injury crashes.

When a local jurisdiction has justified the installation of a RLC based on a safety study as described in the Engineering Analysis Template provided in Appendix A, design procedures must be followed as specified in Section D of this guideline. The implementation of the RLC must be coupled 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 camera installation and aid in future decision making. To that end approval to install, maintain, revise, repair and operate a RLC is good for one year and subject to the annual reporting requirements in Section E.1. of this guideline. Timely submission of the annual report is required for continued authorization of the RLC.

SHA reserves the right to terminate any approved permits for existing RLC locations if the local jurisdiction does not comply with any provision of this guideline.

SHA reserves the right to revise these provisions, including the associated cost recovery. If a permit is terminated and any of these provisions or the cost recovery is modified, SHA will notify the local jurisdiction of such changes.

These procedures and the respective responsibilities of SHA and the local jurisdiction (including contractors) are set forth in this guideline.

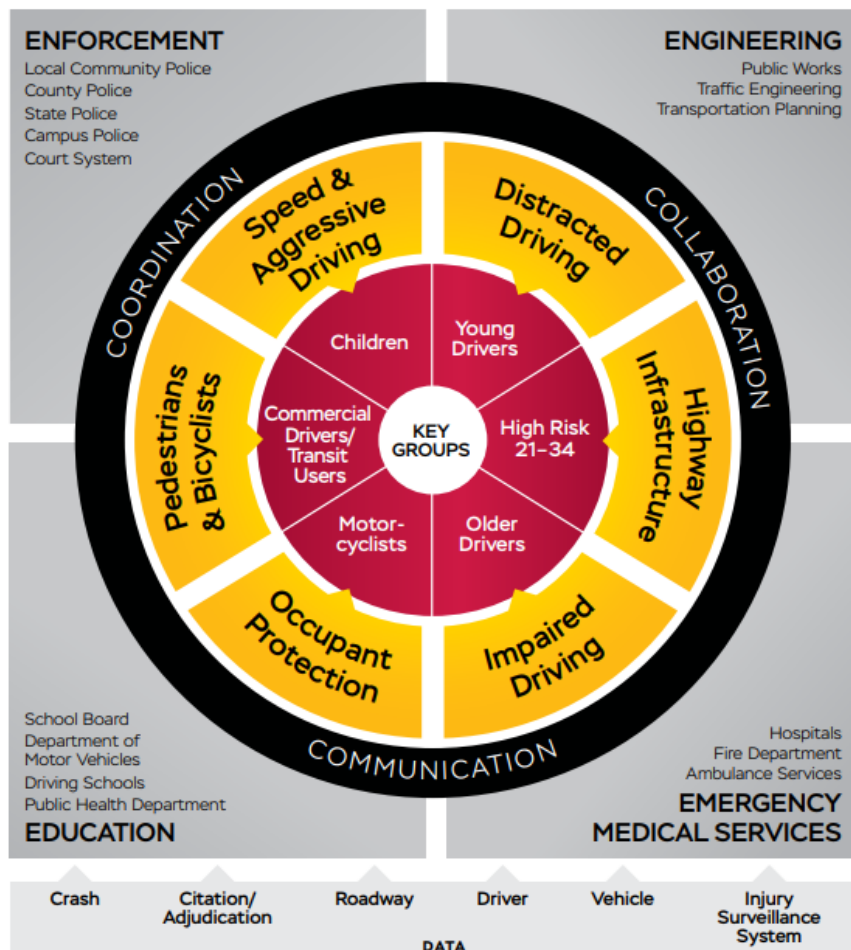
Maryland’s Strategic Highway Safety Plan

In 2019, the Maryland legislature passed Vision Zero legislation, which set a goal of zero motor-vehicle-related fatalities or serious injuries by 2030. The Vision Zero law provides for an MDOT-designated coordinator to oversee the implementation of the plan, collaborate with other State agencies and local authorities, provide yearly reporting, and develop strategies to achieve the established goals. Maryland’s Strategic Highway Safety Plan (SHSP) identifies six emphasis areas and six key groups of motor vehicle users, as shown in Figure 1, to guide its approach to achieving zero deaths. Similarly, the

U.S. Department of Transportation’s Safe System Approach seeks to reach the goal of zero roadway fatalities by emphasizing a safety culture which acknowledges six principles that include: deaths and serious injuries are unacceptable, humans make mistakes, humans are vulnerable, responsibility is shared, safety is proactive, and redundancy is crucial.

Within the context of the SHSP and the Safe System Approach, the use of automated traffic control signal monitoring system, such as RLCs, is an important strategy to improve compliance and reduce crashes that result in fatality and serious injury where conventional enforcement techniques are not feasible or have been ineffective. To ensure that the use of RLCs is commensurate with the safety needs and in accordance with authorization in §21-202.1 in the Annotated Code of Maryland, they should be installed only after it is determined that other mitigation techniques do not or would not reduce the number of red-light violations that contribute to angle crashes. Enhanced traffic safety, not revenue generation, must be the principal aim.

Figure 1: Maryland's Strategic Highway Safety Approach



GUIDELINES

A. Process for Approval of a New RLC Location

1. Engineering Analysis Template Submitted with Request for RLC

The Local jurisdiction shall submit the completed Engineering Analysis Template requesting the RLC to the appropriate District as specified in Table 1. Upon receipt of the request, the District should forward the request to the Office of Traffic Safety Traffic Development & Support Division (OOTSD) within five (5) business days. An Engineering Analysis Template is provided in Appendix A

Table 1: District Contacts

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 West Warren Road Hunt Valley MD 21030	410-229-2380
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

- a) The supporting documentation 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 (i.e., number of angle crash, number of citations for red-light running vehicles, number of crashes involving vulnerable road users).

- iii. The most recent three-year police-reported crash data. If crash history includes pedestrian-involved crashes, five years of police-reported crash data must be submitted.
- iv. Violation data including lapsed time from beginning of red and violation. A violation should be counted in 0.1 second increments beginning 0.5 seconds after the start of the all-red phase, providing vehicles a buffer period to cross the stop line and clear the intersection. The term violation in this guideline means that vehicles cross the stop line after 0.5 second of red indication and pass through the intersection during the all-red phase or other approaches green phases.
- v. Statement of agreement from the local county/city government.
- vi. Traffic Signal Timing Charts for traffic signals not maintained by SHA. If this information is not available to the Local jurisdiction, documentation stating this should be included with the request to SHA, and 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 SHA review will not begin until this information is provided. Specification of technology to be deployed.

2. Review by SHA

SHA (OOTS TDSD) and the District Traffic Office will jointly review each submitted location to ascertain if any engineering improvements or maintenance items would likely alleviate the red-light running problem or if any planned improvements would affect the installation. The review will cover various engineering elements, including but not limited to signal conspicuity (line of sight, etc.), phasing, system needs, timing (including change and clearance intervals), signing, pavement markings, and confirmation that the traffic signal vehicle detectors are operating.

Should the SHA identify any signal issues or malfunctions during the review of the signal, including signal timing adjustment and vehicle detector set up, these issues will be addressed. If vehicle detectors are not functioning properly, the District Office shall report this to the SHA Signal Shop or respective maintainer of the traffic signal who will repair or replace the detector. The noted issues must be repaired, and the number of red-light violations must be re-evaluated before an electronic Design Request (eDR) is submitted for a RLC installation. If additional information is required from the local jurisdiction, SHA (District) will notify the local jurisdiction.

If the signal is operating properly and there is no other engineering improvement that would reduce the red-light running problem, OOTS TDSD will notify the District to submit an eDR for the requested locations. For each location, the SHA District Office shall complete "District Checklist for the Installation of RLC on State Highways or at SHA Signals" form found in Appendix B, the name, address, and phone number of the local jurisdiction contact and contractor, and any other recommendations/comments and should be attached to the eDR.

If the submission from the local jurisdiction is determined to be complete and no other engineering improvements are identified to reduce the red-light running problem, OOTS TDSO and District Office will complete its review within thirteen (13) business days per location. If there is a missing supporting document or missing information in the Engineering Analysis Template, the District Office will contact the local jurisdiction to request the missing information. Once the local jurisdiction submits the missing information, the review period will restart. If the review determines that the RLC installation is not justified, the District will send a letter to the local jurisdiction informing them of the denial.

3. Submission and Review of eDR

Once OOTS TDSO and the District Office have completed the joint review and determined that a RLC is justified, the District will submit the eDR within five (5) business days. Once submitted, OOTS will review the eDR to ensure modification or concerns are addressed. If all comments have been addressed and there are no further concerns, OOTS will approve the eDR in five (5) business days. The District will notify the local jurisdiction of approval within two (2) business days.

4. Local jurisdiction to Submit Plans

Once OOTS has approved the eDR, the local jurisdiction will submit the formal electronic plans for review to OOTS Traffic Engineering and Design Division (TEDD). All questions related to the design of RLC Systems shall be handled by the OOTS TEDD's Division Chief, reachable at 410-787-4027. OOTS TEDD will review the submission and either submit the plan for approval or decline the plan pending revisions within fifteen (15) business days. The plan approval process will take up to 20 business days for all approvers to sign off the plan.

- a) All plans shall be designed by a consultant with experience in traffic engineering principles and design.
- b) All plans submitted shall follow current 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) Catalog cuts of all materials/items to be used shall be submitted to the District.
- e) If modifications are necessary to the existing intersection lighting, a set of plans which include the proposed modifications to the lighting and photometric analysis shall be submitted. The local jurisdiction shall be responsible for the cost of the upgrade.

5. Cost Recovery

After approving the plans, OOTS TEDD will forward the approved plans to the OOTS Contracts and Finance Division (CFD). OOTS CFD will issue a letter for cost recovery within seven (7) business days and will distribute the approved plan within ten (10) business days following the receipt of a check from the local jurisdiction. The cost recovery fee is based on the number of approaches where a RLC will be installed.

6. Construction and Inspection

After the local jurisdiction receives the approved plans, they will obtain a permit from the District for

work within the right-of-way. The local jurisdiction will initiate construction coordination with OOTS TOD (Traffic Operation Division) in accordance with the guidance in Section D, beginning with D.5, within twenty (20) business days of receiving the permit.

B. Process for Approval to Update an Existing RLC

1. DR Submitted for RLC Update

The local jurisdiction shall complete a DR and submit it along with the supporting documentation, to the District as specified in Table 1. The District should forward the request to OOTS TDSD within three (3) business days.

- a. The supporting documentation for *updating* an existing RLC shall include:
 - i. The most recent three-year police-reported crash data.
 - ii. Violation data including lapsed time from beginning of red and violation. A violation should be counted in 0.1 second increments beginning 0.5 seconds after the start of the all-red phase, providing vehicles a buffer period to cross the stop line and clear the intersection. The term violation in this guideline means that vehicles cross the stop line after 0.5 second of red indication and pass through the intersection during the all-red phase or other approaches green phases.
 - iii. Traffic Signal Timing Charts for traffic signals not maintained by SHA.
 - iv. The most recent Annual Report, as required in Section E of this guideline, must be submitted with the request.
 - v. Specification of the new technology to be deployed.

2. Review by SHA

SHA (OOTS TDSD) will review the request and supporting materials. If additional information is required from the local jurisdiction, the District Office will notify the local jurisdiction.

If the submission from the local jurisdiction is determined to be complete and no other engineering improvement is identified to reduce the red-light running problem, OOTS TDSD will complete its review within ten (10) business days per location. If there is a missing supporting document or missing information in the Engineering Analysis Template, the District Office will contact the local jurisdiction to request the missing information. Once the local jurisdiction submits the missing information, the review period will restart. The District will notify the local jurisdiction within two (2) business days.

3. Local jurisdiction to Submit Plans

Once OOTS has approved the eDR, the local jurisdiction will submit the formal electronic plans for review to OOTS Traffic Engineering and Design Division (TEDD). All questions related to the design of RLC Systems shall be handled by the OOTS TEDD's Division Chief, reachable at 410-787-4027. OOTS TEDD will review the submission and either approve or decline the request within fifteen (15) business days.

- a. All plans shall be designed by a consultant with experience in traffic engineering principles and design.
- b. All plans submitted shall follow current 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 photometric analysis shall be submitted. The local jurisdiction shall be responsible for the cost of the upgrade.
- e. Catalog cuts of all materials/items to be used shall be submitted to the District.
- f. Application for utility power service shall be the responsibility of the RLC design consultant or local jurisdiction.

4. Cost Recovery

After approving the plans, OOTS TEDD will forward the approved plans to the OOTS Contracts and Finance Division (CFD). OOTS CFD will issue a letter for cost recovery within seven (7) business days and will award the project within ten (10) business days following the receipt of a check from the local jurisdiction.

5. Construction and Inspection

After the local jurisdiction receives the approved plans, they will obtain a permit from the District for work within the right-of-way. The local jurisdiction will initiate construction coordination with OOTS TOD (Traffic Operation Division) in accordance with the guidance in Section D, beginning with D.5 within twenty (20) business days of receiving the permit.

C. Process for Approval of an In-Kind Repair to a RLC

1. Request Submitted to SHA

The local jurisdiction will forward a memo and catalog cuts of all materials/items to be used for each site to the District. The District will forward the request to OOTS TOD, who will process the request and advise the local jurisdiction of approval within ten (10) business days.

2. Construction

The local jurisdiction will submit a Lane Closure Permit application to the respective District and coordinate repairs with OOTS TOD.

3. Inspection and In-Kind Repairs Reviewed with Contractor

Following issuance of the permit, the contractor shall initiate work within twenty (20) business days. OOTS TOD is required to discuss the inspection and in-kind repairs with the contractor.

D. RLC Design & Construction Guidelines

1. The local jurisdictions shall install, upgrade, 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 (MdMUTCD).
 - 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 SHA Traffic Control Devices Design Manual.
 - i. AASHTO’s A Policy on Geometric Design of Highways and Streets.
 - ii. The AASHTO Roadside Design Guide.
 - iii. The High Voltage Line Act (Articles 89, Section 58 to 63, inclusive, of the *Annotated Code of Maryland*)
 - e. The National Electrical Code and the National Electrical Safety Code.
 - f. The Illuminating Engineering Society of North America’s American National Standard Practice for Roadway Lighting ANSI/IESNA RP-8-00; and
 - g. All other applicable codes.
2. The RLC should be attached to a separate pole installed by the local jurisdiction. If this is not feasible, the RLC may be attached to a SHA signal structure, subject to a device attachment agreement signed by SHA and the local jurisdiction.

If the RLC utilizes SHA equipment, all the wires associated with the RLC system shall be placed in a red protective sleeve. The protective sleeve shall separate RLC wires from existing SHA signal wires at all times, including but not limited to hand holes, conduit, signal structures and span wire.

3. 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.
4. Upon receipt of the approved plans from the SHA, the local jurisdiction shall notify the following agencies at least 72 hours prior to beginning the construction of any component of RLC equipment:

Table 2: Notification Prior to Construction of RLC

Agency	Phone Number	Reason for Contacting
OOTs TOD Traffic Control Device Inspection Section (TCDIS)	410-787-7632 Fax: 410-582-5610	Construction Stakeout/Inspection
* The RLC Contractor shall notify TCDIS by 3:00 pm on the day prior to each day of on-site work.		
Miss Utility	1-800-257-7777	Marking of Underground Utilities
Traffic Operations Division (TOD) – Signal Shop	410-787-7650	Marking of SHA-Owned Signal Equipment
Appropriate SHA District Office	See Table 1	Lane Closure Permits & District Permit for Work

5. Upon receipt of the approved plans and following advance notice to the above agencies, SHA will allow the local jurisdiction to install/modify equipment pertaining to their RLC system on SHA right-of-way at no cost to SHA.
6. The contractor shall conform to the following requirements for obtaining power, communication, and signal outputs from the controllers at no cost to 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. The local jurisdiction must also pay an integration fee for the Signal Shop's work, in addition to any costs for parts and/or equipment.
 - 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 SHA Standards) from the metered service pedestal to the signal cabinet.

For intersections where an existing RLC is being upgraded, 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) (please refer to Table 2) and 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, SHA will not provide temporary power to the RLCs.

- b. Signal Outputs
The local jurisdiction shall install in-line fuses on all signal outputs 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
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.
7. A final inspection will be required for the installation of each RLC location. The local jurisdiction shall notify OOTS at the phone number provided in Table 2 to request a final inspection. OOTS TCDIS requires at least ten (10) business days before scheduling the final inspection (refer Appendix D for example of approval letter).

8. After OOTS TCDIS approves the installation, OOTS TCDIS will require a minimum of two weeks to coordinate with other SHA sections/divisions 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.
9. 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.
10. If the RLC is to be connected to a traffic signal owned by SHA and maintained by the local jurisdiction in accordance with a separate agreement between SHA and the local jurisdiction, SHA will allow the local jurisdiction to make the wiring connections at no cost to 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.
11. SHA will notify the local jurisdiction if any of the camera equipment (including loops) will be impacted by an 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, 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 SHA to re-install their equipment. For revised camera locations, a DR with supporting documentation must be submitted to SHA.
12. Whenever there are impacts to signal structures (e.g., severe weather, vehicle hit) the local jurisdiction shall notify SHA immediately. A formal structural inspection and test shall be performed by SHA prior to the installation of replacement poles and mast arms and following any structural impact regardless of apparent condition. Requests for structural inspections and tests shall be directed to impact@mdot.maryland.gov.
 - a. The local jurisdiction shall repair any item associated with the RLC system within three (3) business days of any damage and/or malfunction. If the damage and/or malfunction cannot be expediently repaired the local jurisdiction shall immediately notify SHA. 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 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 SHA signal equipment is caused by the construction, maintenance, or operation of the RLC, 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 SHA. All repairs to any traffic signal equipment will be at no cost to SHA.

- c. Any damaged traffic signal equipment owned and maintained by SHA that is connected to or associated with a RLC shall be reported immediately to SHA. If the damage and/or malfunction of the SHA signal 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 SHA Maintenance Forces must respond to a traffic signal where the RLC is damaged or caused damage/malfunction to the traffic signal, SHA will bill the local jurisdiction for the cost of the necessary repairs to the traffic signal. SHA shall not be obligated to repair the RLC but may disconnect the signal outputs to the RLC, if necessary.
13. The local jurisdiction shall contact the OOTS Signal Shop (contact information in Table 2) whenever they are taking a camera temporarily out of service. The Signal Shop will then disconnect the signal outputs from the signal controller. If the signal is maintained by other than SHA but owned by SHA, additional coordination between SHA and local is required. 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 SHA finds a signal where the signal outputs are still hooked up, but the camera is not at the location or active, 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.
14. 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 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 SHA. All removals shall be done to SHA Standards. The local jurisdiction shall notify OOTS TCDIS prior to removing any equipment.

E. Post Installation Requirements

The local jurisdiction shall 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 the Office of Traffic and Safety (OOTS). The annual report shall include:

1. Annual Report Requirements:
 - a. Location, direction, movements and/or travel lanes being monitored.
 - b. Date of RLC activation.
 - c. Crash data for three years before and a minimum of one year after RLC activation.
 - d. The total number of citations recorded for each location at each direction/travel lane/movement.
 - e. Maintenance records including the date last calibrated.
 - f. Local jurisdiction contact info (name, phone number, email address, mailing address and fax number).
 - g. Analysis of the data and the efficacy of the RLC in improving intersection safety.
 - h. Annual report submission time frame (60 calendar days after activation anniversary). If a local jurisdiction has more than 5 RLC installed SHA's intersection, combined annual report can be submitted by March 1st every year with all necessary data from each location.

2. If the reported data do not demonstrate an improvement in intersection safety following installation of the RLC, OOTS and the local jurisdiction will further evaluate the intersection to determine what factors contribute to the safety issues.
3. If a local jurisdiction fails to comply with the annual reporting requirements, SHA reserves the right to revoke the RLC permit.

F. Inappropriate Locations for RLC Installation

RLCs should not be used in the following locations:

- Recent changes to intersection or signal within 3 years, including but not limited to the changes to roadway geometry, lane configuration, and signal phase and timing plan.
- Newly installed signal within 3 years.
- Planned intersection or signal changes within the next 12 months, including but not limited to the changes to roadway geometry, lane configuration, and signal phase and timing plan. Anticipated road or utility work.
- Expected changes in traffic patterns due to development, construction detours or similar events.
- Intersection approaches with a high number of rear-end crashes.
- Areas in which the speed limit changed within the last 3 years. (additional justification required for less than 3 years)
- Intersection where motorists' line of sight to the intersection and signal is obstructed.

Questions and comments regarding the RLC Provision Document shall be submitted in writing to the TDSO Chief at the following address:

State Highway Administration
Office of Traffic and Safety
Attn: Chief, Traffic Development and Support Division
7491 Connelley Drive
Hanover, MD 21076

APPENDICES

**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
CAMERAS ON STATE HIGHWAYS OR AT
STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

Appendix A: Engineering Analysis Template

**TRAFFIC SIGNALS
RED LIGHT CAMERA ENFORCEMENT
ENGINEERING ANALYSIS TEMPLATE**

Local Jurisdiction: _____ SHA District: _____
(County/City/Town)

Intersection: _____
Street Name (Route #) at Street Name (Route #)

Intersection approaches under consideration for RLC enforcement:

This Study performed under the direction of _____
(licensed professional engineer)

A. INTERSECTION & SIGNAL DATA (Include information on all approaches not just those under consideration for photo enforcement)

1. Signal Visibility

a. Minimum Sight Distance to Signal

Approach	Grade	Speed Limit (mph)	Measure (ft)	Required (ft)*

*See attached table of minimum sight distance requirements from the MUTCD.

- b. Are "SIGNAL AHEAD" signs present? Yes No
 Are "SIGNAL AHEAD" signs needed? Yes No
 Are other warning signs present in the vicinity of the intersection? Yes No
 Explain: _____

c. Information on Signal Heads

Approach	Lens Size	Back Plates (Yes or No)

**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
 CAMERAS ON STATE HIGHWAYS OR AT
 STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

2. Pavement and Marking Data

a. Stop bars in “good” condition? Yes No

Explain: _____

b. Lane lines “clearly” visible? Yes No

Explain: _____

c. Crosswalks “clearly” marked? Yes No

Explain: _____

d. Pavement conditions (ruts, potholes, cracking, etc.)?

- Good Explain: _____
- Fair Explain: _____
- Poor Explain: _____

e. Pavement surface treatments exist? (rumble strips, texturing, pavers, etc.)

- Yes Explain: _____
- No

3. Provide the most recent signal plan for the intersection including: pavement markings, width of lanes and medians, location of signal heads and signs, locations of loop/detectors, and grades. Please check to acknowledge plans are attached.

B. SIGNAL TIMING & TRAFFIC DATA (Include information on all approaches not just those under

Consideration for photo enforcement)

1. Clearance Intervals

Approach	Posted Speed Limit	Grade	Width of Intersection	Yellow Interval		All Red Interval	
				Existing	Calculated*	Existing	Calculated*

*Reference SHA Policy for Determining Yellow Timing at Intersections, March 20, 2003; and SHA All-Red Clearance Guidelines, June 3, 2013

**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
CAMERAS ON STATE HIGHWAYS OR AT
STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

2. Include existing controller settings for each phase and each time-of-day. Information should include applicable settings such as minimum green, max 1 & 2, passage, minimum gap/ext, protected-permissive, lead-lag, yellow and all red, walk and ped clearance time, recall settings, offsets, cycle length, etc. Include analysis of peak hour conditions and discuss whether signal timings (phasing, cycle length, progression, coordination, etc.) are contributing to red-light running problem.

a. Do signal timings or phasing factor in as a possible contributor to red-light running at this intersection?

Yes Explain: _____

No Explain: _____

b. Is there an oversize ped* that is impacting the phases? Yes No

* A pedestrian crossing time is greater than the concurrent traffic movement phase time that potentially leads to the next phase has shorter signal phase time.

c. List comments or recommendations on potential signal timing or phasing changes:

3. Vehicle Detection Data

Approach and Movement	Detection Type (loop, video, etc.)	Detector Location (measured from stop bar)

Confirm that detector location properly corresponds with green extension.

4. 48-Hour Traffic Volume & Classification Data (Concurrent with 12-hour violation survey)

Approach and Movement	Daily Volumes		Peak Hour Volumes	
	Total	Heavy Vehicles	Total	Heavy Vehicles

**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
CAMERAS ON STATE HIGHWAYS OR AT
STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

C. CRASH AND ENFORCEMENT DATA (Include information on all approaches not just those under consideration for photo enforcement)

1. Most Recent Three-Year Crash Data

Collision Type	3-year Total	Number of Injury Crashes	Number of Fatal Crashes	Crashes Associated With Red-Light Running
Angle				
Rear End				
Head On				
Sideswipe				
Pedestrian				
Bicyclist				
TOTAL				

2. Severity Index: _____

3. Violation Rate (Violation should be counted after 0.5 second of all-red phase, providing vehicles a buffer period to cross the stop bar and clear the intersection.)

a. Number of red-light running citations per year issued by law enforcement at the evaluated intersection, if available.

Number: _____ Year: _____

b. 12-hour observed violation rate (conducted concurrently with traffic count survey)

Date: _____

Time Period: _____

Approach and Movement	Traffic Volume	Number of Violations

*per 1000 vehicles

4. Enforcement and Operational Issues

a. Describe the difficulty experienced by law enforcement officers in patrol cars or on foot in apprehending violators.

b. Describe the ability of law enforcement officers to apprehend violators safely within a reasonable distance from the violation.

c. Are pedestrians at risk due to violations? Yes No

Explain: _____

**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
 CAMERAS ON STATE HIGHWAYS OR AT
 STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

Number of pedestrians per hour? _____
 Pedestrian crosswalk provided? Yes No

d. Have there been any changes to the operations of the intersection (signal timing, restriping, or increased enforcement) within the past three years? Yes No
 Explain: _____

Minimum Sight Distance for Signal Visibility

85 th Percentile Speed (mph)	Minimum Sight Distance (ft)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715
Note: Distances in this table are derived from stopping sight distance plus an assumed queue length for shorter cycle lengths (60 to 75 seconds).	

Table 4D-2 Manual on Uniform Traffic Control Devices, (11th Edition) Transportation Research Board (TRB), Washington, DC, 2023

Appendix B: District Checklist

District Checklist for Installation of Red Light Cameras

(to be completed by SHA District Personnel)

**At State Highway Administration
Owned/Maintained Signals**

Location Information

Route: _____

At Intersection With: _____

Approaches: _____

City/Town/County: _____

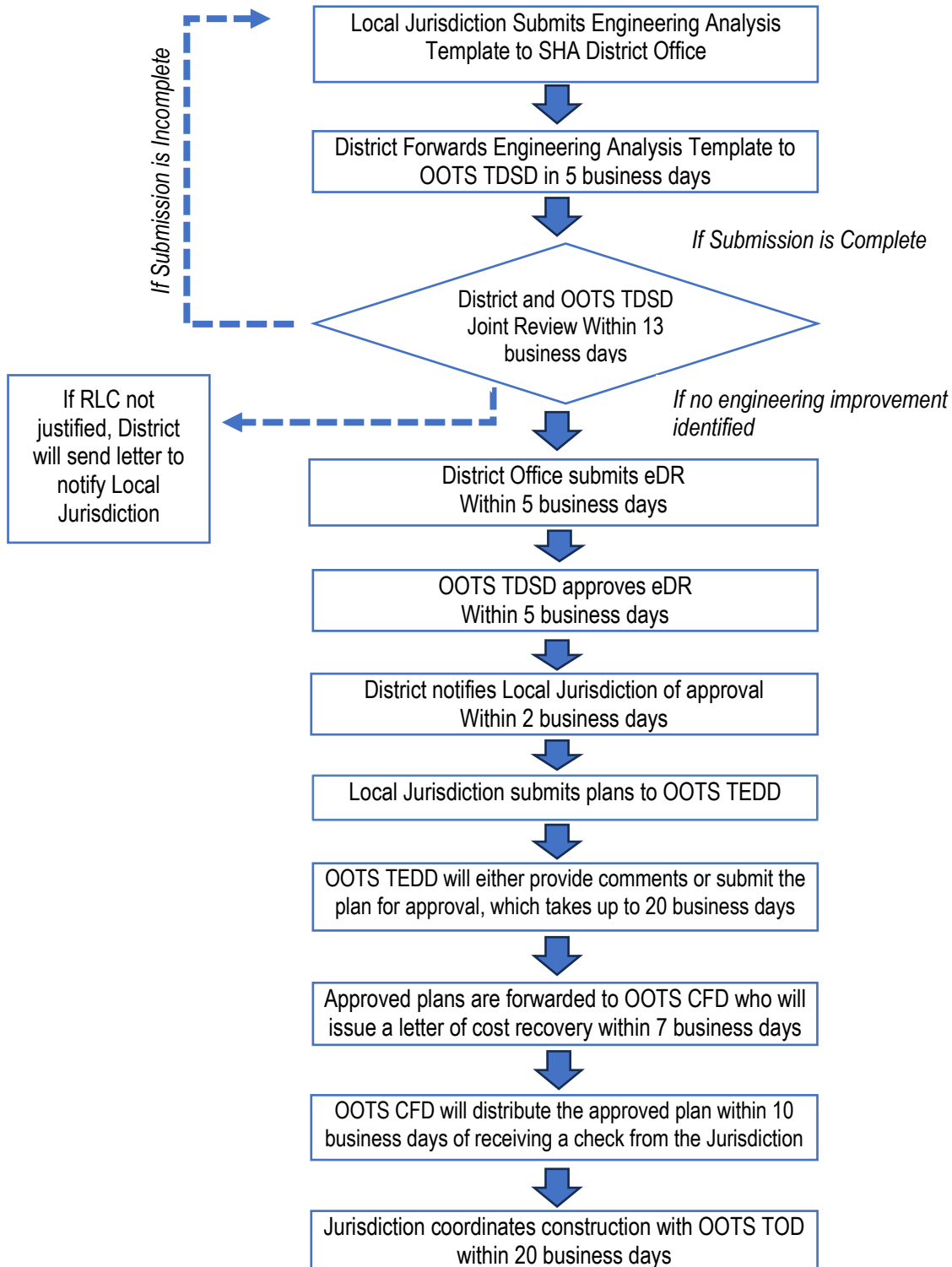
Requesting Jurisdiction: _____

- Location, including approach(es), has been clearly defined.
- Local jurisdiction has established traffic safety needs (crashes, citations, and/or observed violation data) for installing red light camera.
- Traffic signal indications on the approach are clearly visible from adequate distance.
- Vehicle detectors on the approach are functioning properly.
- Clearance interval is adequate.
- Change interval is appropriate.
- Required coordination with nearby traffic signals is in place and properly timed.
- No significant improvement/project is scheduled/planned within next 18 months that would substantially alter the need for a red-light camera or negate its operation.
- No recent intersection or signal changes within the last 3 years, including, but not limited to, changes to roadway geometry, lane configuration, signal phase, and timing plan.
- No newly installed signal within the last 3 years.
- No other known reason why red-light camera should not be installed.

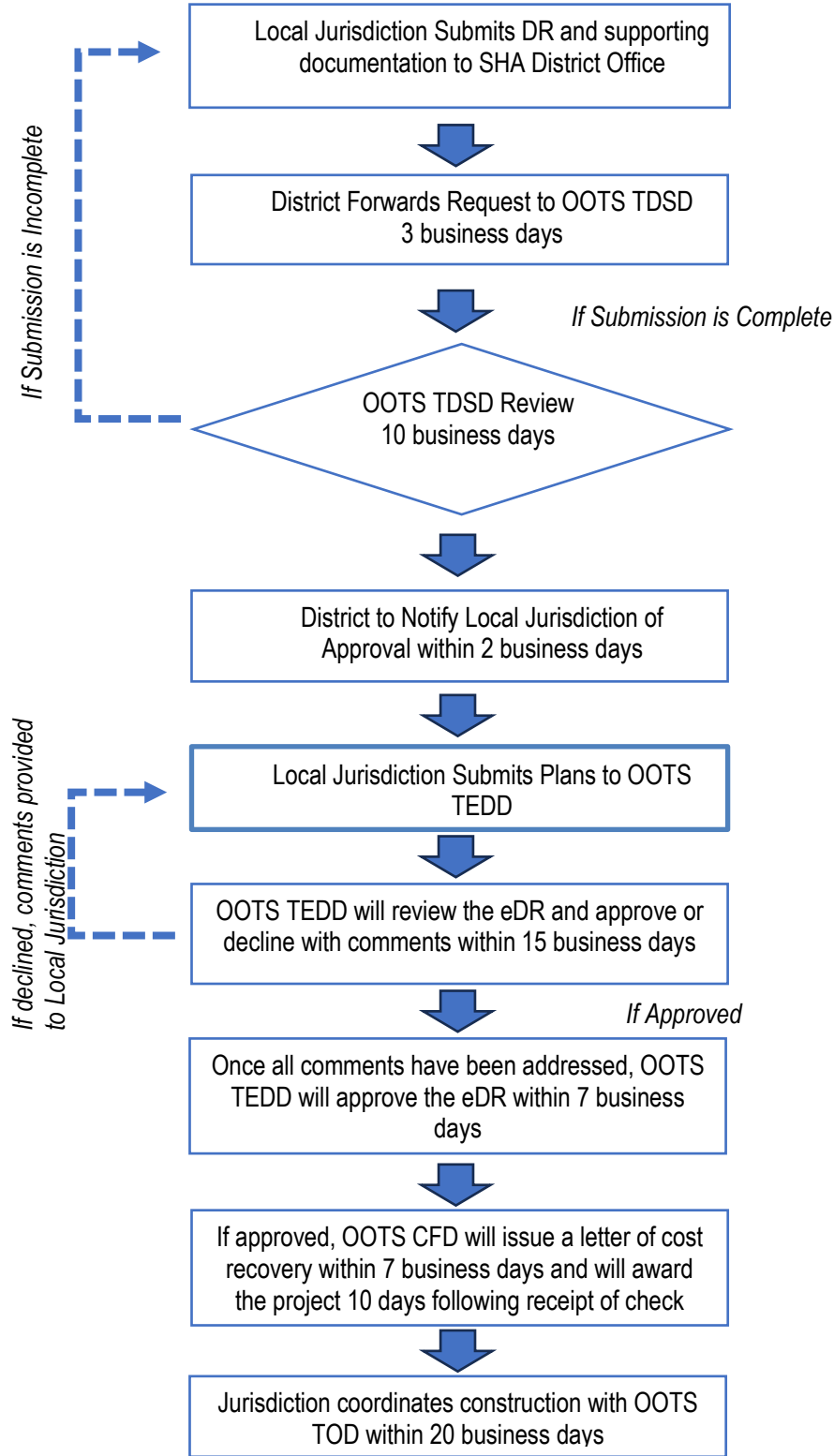
Checklist completed by: _____ Date: _____

Appendix C: Process Flow Charts

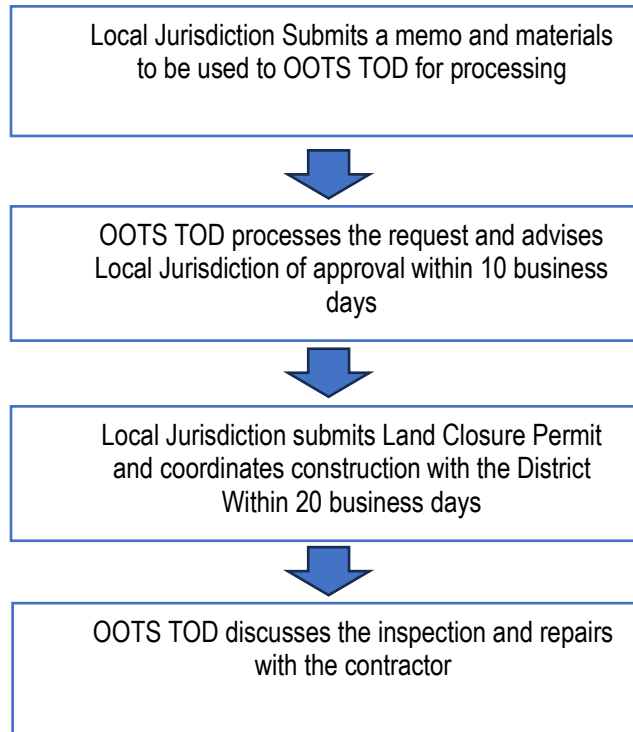
Process A: Request for a New RLC



Process B: Request to Upgrade RLC



Process C: Request for In-Kind Replacement of RLC



**GUIDELINES FOR THE ISNTALLATION OF RED LIGHT
CAMERAS ON STATE HIGHWAYS OR AT
STATE HIGHWAY ADMINISTRATION SIGNALS**

11-X10

Appendix D: Example of Approval Letter



Wes Moore
Governor
Aruna Miller
Lieutenant Governor
Paul J. Wiedefeld
Secretary
Tim Smith, P.E.
Administrator

August 15, 2024

Mr. Contract Manager
Contract Holding Entity
123 Main Street
Anytown MD 21111

Dear Mr. Manager:

Maryland Department of Transportation State Highway Administration (MDOT SHA) Office of Traffic and Safety (OOTS) performed a final inspection for the MDOT SHA billworks contract **BW1235185**, Task **X** (TIMS NO. **X111**) on **January 1, 1111**. This project is for the **modification of the traffic control signal at MD 00 and Any Road**. The inspection found that all traffic control device work was completed satisfactorily and the devices were accepted for maintenance by MDOT SHA as of **[final inspection or other agreed upon date]**.

If further information is required, please contact **Mr. Paul Robinson**, MDOT SHA Traffic Operations Division Area Engineer, at **410-787-7641** or **probinson@mdot.maryland.gov**. **Mr. Robinson** will be happy to assist you.

Sincerely,

Vivian Berra-Figueroa, P.E., Deputy Director
Office of Traffic and Safety

Attachment

cc: **Mr. Michael Basso**, Acting Section Chief, Traffic Operations Division, MDOT SHA
Mr./Ms. Name, Area Engineer, Traffic Operations Division, MDOT SHA
Mr./Ms. Name, Team Leader, Traffic Operations Division, MDOT SHA
Mr./Ms. Name, Office Engineer, Traffic Operations Division, MDOT SHA
Rebecca Lichtenstein, P.E., Assistant Chief, Traffic Operations Division, MDOT SHA
Mr./Ms. Name, Assistant District Engineer for Traffic, District X, MDOT SHA

Appendix E: Acronym Dictionary

LIST OF ABBREVIATIONS AND ACRONYMS

CFD	Contracts and Finance Division
DR	Design Request
eDR	Electronic Design Request
ITE	Institute of Transportation Engineers
MUTCD	Manual of Uniform Traffic Control Devices
MDOT	Maryland Department of Transportation
OOTS	Office of Traffic and Safety
RLC	Red Light Camera
SHA	State Highway Administration
SHSP	Strategic Highway Safety Plan
TCDIS	Traffic Control Device Inspection Section
TDSD	Traffic Development and Support Division
TEDD	Traffic Engineering Design Division
TOD	Traffic Operations Division

