

# OREGON TRAFFIC CONTROL DEVICES COMMITTEE

## Meeting Agenda

March 20, 2015

[ODOT TLC Bldg.](#), Alsea Conference Room  
4040 Fairview Industrial Drive, Salem

9:00 – 9:10	Welcome / Building Orientation / Introductions / Approve Previous Minutes	Jeff Wise
9:10 – 9:15	Business from the Audience <i>Public Comment on Non-Agenda Topics</i>	Pam O'Brien
9:15 – 9:30	Red Light Camera Guidelines Update <i>Information / Recommendation to Approve</i>	Craig Black
9:30 – 10:00	Signal Policy & Guidelines Update <i>Informational Overview of Changes</i>	Craig Black
10:00 – 10:15	Forming Subcommittees for Possible Draft of Next Edition of MUTCD Review <i>Discussion</i>	Kevin Haas
10:15 – 10:30	Legislative Update <i>Information</i>	Kevin Haas
10:30 – 10:45	Roundtable <i>Local Jurisdiction Issues - Discussion</i>	All Committee Members
10:45 – 10:50	Not-on-Agenda Items	Pam O'Brien
10:50 – 10:55	Agenda Items for Future Meetings	Pam O'Brien

## 2015 OTCDC Meeting Schedule

<i>Date</i>	<i>Location</i>
January 16	ODOT TLC Bldg., Alsea Conf. Rm., 4040 Fairview Ind. Dr., Salem
March 20	ODOT TLC Bldg., Alsea Conf. Rm., 4040 Fairview Ind. Dr., Salem
May 15	(w/ITE), TBD
July 17	ODOT TLC Bldg., Alsea Conf. Rm., 4040 Fairview Ind. Dr., Salem
September 18	ODOT TLC Bldg., Alsea Conf. Rm., 4040 Fairview Ind. Dr., Salem
November 20	ODOT TLC Bldg., Alsea Conf. Rm., 4040 Fairview Ind. Dr., Salem

# Oregon Traffic Control Devices Committee

[January 16, 2015](#)

## Meeting Minutes

ODOT [Technical Leadership Center](#), 4040 Fairview Industrial Drive SE, Salem, Oregon

*Members Present:* [Jeff Wise](#), ODOT Region 5, Chairperson; [Bob Pappé](#), Secretary, ODOT State Traffic Engineer; [Brian Barnett](#), City of Springfield; [Joseph Marek](#), Clackamas County; [Jim Rentz](#), OSP; [Cynthia Schmitt](#), Marion County;

*Members Present via i-link:* [Mike Caccavano](#), City of Redmond; [Ed Chastain](#), Lane County; [Alex Georgevitch](#), City of Medford

*Members Absent:* [Pam O'Brien](#), DKS Associates, Vice Chair

*Others Present:* Scott Beard, Kittelson & Associates; Cecilia Hague, Washington County; Kevin Hottmann, City of Salem; Matthew Machado, City of Portland; Julia Uravich, Marion County; Doug Bish, Craig Black, Scott Cramer; Kevin Haas, Katie Johnson, Marie Kennedy, Mike Kimlinger, Justin King, Scott McCanna, Kathi McConnell, Gary Obery, Chris Rowland, Zahidul Siddique, ODOT Traffic/Roadway Section; Joel McCarroll, ODOT Region 4.

### **Introduction – Approval of Minutes – Additional Agenda Items**

New 2015 Chair Jeff Wise called the meeting to order at 9:00 a.m. and called for introductions from all attending (see attendance above). Jeff thanked 2014 committee chair Mike Caccavano and vice-chair Ed Chastain for their service. He also noted the reappointment of Brian Barnett for another three years representing the LOC. Cindy Schmitt moved, Joe Marek seconded, and the committee approved the [November 2014 OTCDC Meeting Minutes](#).

### **Business from the Audience/Public Comment on Non-Agenda Topics**

None to report.

### **January NCUTCD Meeting Report**

Scott Beard [reported](#) on the January 7-9 [NCUTCD Meeting](#) held in Arlington, Virginia. He listed other Oregon Attendees as including Mike Coleman, Tom Lancaster, Peter Koonce, Lee Rodegerdts, Eric Niemeyer, Dave Smith, and himself.

## Roundabouts Task Force

- Discussion on ongoing unpublished research - FHWA TOPR 34 – Task 9 having to do with Human Factors Assessment of Traffic Control Device Effectiveness to determine when and how to sign and mark roundabouts (particularly multi-lane). Also signaling roundabouts – metering signals to increase capacity, pedestrian crossing signals, and railroad preemption signals















## When and how to sign and mark roundabouts

### Signals Technical Committee

- NCHRP 03-118 – Decision Making Framework for Signal Phasing – Decision making on left and right turn phasing, etc.
- Placement of pedestrian instruction sign – focus on making Parts 2 and 4 consistent and having the signs adjacent to the signal unless it has Braille, then Braille within 18 inches above center of push button
- Monitoring of FYA in the middle signal face – comment from a manufacturer about compatibility with conflict monitoring software which worked in the bottom position and may have to be reprogrammed to work with the center position. There was some discussion on whether it should be required to be monitored or not.
- Yellow times - Caltrans has added calculation to the CA MUTCD using either the 85th-percentile speed or posted + 7 (>30mph)/+10 (<30mph) to address political concerns
- Yellow LED border on pedestrian signals has driver expectancy issues, conspicuity issues, question of same or better benefit than the pilot light.

### Signals Technical Committee – Wednesday

Bike signals at Pedestrian Hybrid Beacons - Berkeley's proposed phasing illustrated:

<p><b>Phase 0 (Unactivated Beacon)</b></p> <p>Remains in this phase until pedestrian push button ("PB") is activated or a bike is detected</p>	 <p>All Beacon Faces Dark (Free Flow Conditions)</p>	 <p>Steady Red Steady "Don't Walk"</p>	<p><b>Bicyclists and pedestrians both see flashing red (orange) when motorists see flashing red (= all-way STOP)</b></p>
<p><b>Phase 1 (Motorists Slow Down)</b></p> <p>Ashby Motorists: Flashing Yellow alerting them to Slow Down, pedestrians or bicyclists have activated the Pedestrian Hybrid Beacon (PHB).</p> <p>Bike Signal: Solid Red ("Wait") indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") indication.</p> <p>Proposed Duration: 4 seconds</p>	 <p>Flashing Yellow ("Slow Down")</p>	 <p>Steady Red Steady "Don't Walk"</p>	
<p><b>Phase 2 (Motorists Prepare to Stop)</b></p> <p>Ashby Motorists: Solid Yellow alerting them to Prepare to Stop. Bikes and Pedestrians still have steady red ("Wait") indications.</p> <p>Bike Signal: Solid Red ("Wait") indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") indication.</p> <p>Proposed Duration: 3 seconds</p>	 <p>Steady Yellow ("Prepare to Stop")</p>	 <p>Steady Red Steady "Don't Walk"</p>	
<p><b>Phase 3A (Bike/Ped Green Indication)</b></p> <p>Ashby Motorists: Solid Red, requiring them to Stop.</p> <p>Bike Signal: Solid Green ("Proceed")</p> <p>Pedestrian Signal: "Walk" indication</p> <p>Proposed Duration: 7 s (min) to 16 s (max). Green time to be extended when an additional bike is detected approaching intersection after PHB phasing is already activated.</p>	 <p>Steady Red ("Stop", Pedestrians/Bikes Crossing)</p>	 <p>Steady Green Steady "Walk" indication</p>	
<p><b>Phase 3B (Bike Yellow Change Interval)</b></p> <p>Ashby Motorists: Solid Red, requiring them to Stop.</p> <p>Bike Signal: Steady Yellow ("yellow change interval").</p> <p>Pedestrian Signal: "Walk" indication</p> <p>Proposed Duration: 3 seconds</p>	 <p>Steady Red ("Stop", Pedestrians/Bikes Crossing)</p>	 <p>Steady Yellow Steady "Walk" indication</p>	
<p><b>Phase 4A (All-Way Stop Condition)</b></p> <p>Ashby Motorists: Alternating Flashing Red, requiring them to Stop, then proceed with Caution if Clear.</p> <p>Bike Signal: Flashing Red (Stop, then proceed).</p> <p>Pedestrian Signal: Countdown phase continues.</p> <p>Proposed Duration: 14 seconds</p>	 <p>Alternating Flashing Red ("Stop, Proceed with Caution when Clear")</p>	 <p>Flashing Red Flashing Upraised Hand &amp; Countdown</p>	
<p><b>Phase 4B (Bike/Ped Red Clearance Interval)</b></p> <p>Ashby Motorists: Alternating Flashing Red, requiring them to Stop, then proceed with Caution if Clear.</p> <p>Bike Signal: Solid Red ("Wait") indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") indication.</p> <p>Proposed Duration: 3 seconds</p>	 <p>Alternating Flashing Red ("Stop, Proceed with Caution when Clear")</p>	 <p>Steady Red Steady "Don't Walk"</p>	

### FHWA Update

- Notice of Proposed Amendment (MUTCD) Status - NPA complete internal to FHWA team. OMB still determining if significant economic impact might require economic analysis which may cause some delay. If not, looking at NPA projected date of May 15, 2015. Then there will be a 6 month comment period, further internal FHWA review and projected May/June 2017 final rule. There is going to be some reduction in standards (approximately 30% in Part 4, for example) but the reworking of all the levels of mandate will not be in this Manual.

### Edit Committee

- Sponsor comment form changes to make the spreadsheet submittal form to make comments more uniform
- Material from Technical Committees will be improved for consistency by always being produced in PDF format.
- Sites Open to Public Travel may be a topic for June if no NPA is in place, looking at how much of private facility roads should be covered by the MUTCD.
- Formation of a task force to look at issues associated with guidance extraneous to the MUTCD. Traffic control innovations are happening at greater speed than in the past, and there is pressure from outside groups such as [NACTO](#) to speed the MUTCD approval process. This possibly could increase the use of interim approvals to incorporate changes between Manuals.

### Canadian MUTCD

- Rectangular Rapid Flashing Beacon installation guidance - above sign, limited to pedestrian use, and the Canadians are developing warrants for their use.
- Digital billboards have regulatory and safety assessment guidelines to restrict the areas of placement to disinclude interchanges, roundabouts and where they may conflict with signal installations.

Kevin asked committee members to start thinking about what OTCDC subcommittees they would like to be a part of in anticipation of FHWA possibly releasing a draft of the next edition of the MUTCD sometime in 2015. Subcommittees would be organized based on various Parts of the MUTCD. This would be an agenda item for the next OTCDC Meeting.

### **Pedestrian Channelization Devices in Work Zones**

Cindy Schmitt and Julia Uravich discussed Marion County issues and successes in selecting and getting [pedestrian channelizing devices \(PCD\)](#) productively installed in work zones. Cindy noted problems encountered in introduction of these devices in urban federal aid projects where they're adding bike paths and sidewalks to two-way roads. To

start out with, contractors were unfamiliar with and didn't have them on hand. Then the cost of the devices was an issue which the county managed to deal with by purchasing the devices themselves at about half the cost as a workaround.

They found in utilization there isn't much specific guidance on what the primary objective is for using them between various competing benefits. There are a variety of opinions out there between the professional engineers, construction people, inspectors, etc. as to what their primary protection purpose is; whether it's to channelize pedestrians through the project, to protect them from the construction work, to protect them from things which you might have previously used traditional [Type 2 barricades](#) around, to protect them from moving traffic, etc. The problem they ran into was when billing the devices back to the project. ODOT inspectors would tell them they weren't being used properly and wouldn't be paid for under federal aid guidelines. The county wants a discussion of the rules which apply to these barriers for usefulness and federal dollars.

Note: Amongst the publications regarding PCD's brought up in the discussion were:

- [MUTCD Chapter 6, Section 6F.63 Section 6G.05](#)
- [USAB Revised Draft Guidelines for Accessible Public Rights-of-Way Chapter 3,](#)
- [Oregon 2015 Standard Specifications](#)
- [Qualified Products List](#).

Julia Uravich ran through a [PowerPoint](#) presentation discussing and illustrating the issues, including impracticality of use of PCD's in some tight work zones, when they have to be used, when they're practical, when impracticable. Projects illustrated included Ward Drive in NE Salem, Auburn Road in the Four Corners area.

Scott McCanna discussed ODOT's entry into the use of PCD's and what their original purpose was (to aid visually impaired, ADA pedestrians). They should provide hand and feet/cane guidance past hazards for this population.

Applied in the work zone, the first piece is pedestrian separation from the work area for personal safety and to prevent liability issues. They should also keep people away from excavation area drop-off's. In dealing with ADA requirements, the PDA's should keep these pedestrians on paved or concrete surfaces which are free of gravel, dirt, etc. Then there was the suggestion of using these to separate peds from traffic if we move them off the established facility into harm's way during construction as a channelizing device. Other older methods such as cones aren't good because they aren't helpful to the visually impaired. Scott noted ODOT, too has had to deal with high costs, which have since come down some.

Regarding where PCD's are now required, Scott agreed it is a bit subjective, open to interpretation. He said the MUTCD and other accessibility documents are general for a purpose, leaving each jurisdiction the room to develop their own internal policies. ODOT's first crack at this was the standard drawing, the specification or special provisions, the Traffic Control Plans Design Manual. They're not optimum and need improvement but ODOT has been gaining experience and Scott expects to change ODOT design policies

and processes and get other jurisdictions a better list of where, when and why to use the PCD's as fast as possible.

Cindy reiterated concerns over her finding projects have more confined environments in local agency use than on state highways. Scott suggested they feel free to modify their policies and procedures for their use. But he noted the state is also running into confined space issues.

What to do when there's no existing pedestrian facility? Scott's research on sources at the national level when work zones impact a roadway and require a temporary pedestrian route, it should be equal to or better than the existing facility. It is better if you can improve even an unpaved, pedestrian-used path where it's clear there is pedestrian use already. It is project specific, always.

When updating the pedestrian part of ODOT's design manual, Scott said he needs to add information on those considerations. Don't just think about the need to put in pedestrian channelization, give thought to all the details necessary to make it work for the individual project.

In terms of specifications, Bob noted ODOT works with [APWA](#). He asked if the local jurisdictions work with APWA. He suggested establishing a committee with APWA to coordinate this kind of specification. Cindy said this would be helpful.

As to the Design Manual piece, Scott offered to forward changes to the Manual to any agency which would like to be involved for comment or questions. And again, each agency is encouraged to use/modify documents to fit their own needs. Cindy said the County tries to work economically by using ODOT standards, specifications where they can but they're finding out there are many cases where project-specific modifications are necessary. But ideally, she'd like to have something covering a broad range of applications. Bob suggested getting several versions approved and on the shelf which can fit a broader range of applications.

Cindy asked if any other non-ODOT agency has had much experience with the PCD's. Nobody said yes. Mike Kimlinger said we have a sample here we can show and tell. He went and brought it out in the hallway for people to inspect. A web link was also opened for [illustration](#). The committee agreed there are still places where there appears no ideal solution and we have to address these with a good traffic control plan. Ultimately, we have to make smallest risk based choices and bidding contractors should be used to dealing with various restrictions on a job and plan for them before they bid on a job as a regular fact of life.

Bob asked again about the apparent subjectivity about deciding how and when to use the PCD's and the issue of ODOT approving payment under the federal aid rules. Scott said what he's confronting frequently now is the education piece between what's occurring at the standards and practices level and our inspectors and local agency liaisons. Sometimes last minute or after the fact, he will get calls from LAL's who talk about projects and ask what to do in the future. He suggested Cindy ask the LAL to contact Scott or

Justin King for guidance on this kind of issue when it comes up. Scott will come back to update the committee when he has information on changes to the Design Manual.

### **Draft School Area Guide**

Gary Obery [presented](#) progress on ongoing [update work](#) on the Guide to School Area Safety and asked if there were any questions regarding the current early draft.

Bob Pappé said we haven't yet fully addressed risk factors in regard to congestion and high school aged drivers entering and exiting schools. Those were things the public was thinking justified a school zone a couple years ago. He said his review of Gary's draft reminded him of the fatal accident in June of 2013 in Marion County which was discussed in the [September 2013 meeting](#). We started a conversation of this in the committee back then but haven't gotten back to it. Joe agreed it was time to explore options to help increase safety in rural school zones. Kevin said one of the reasons why we have the 20 MPH school zone is because of the survivability factor of pedestrians being struck. One of the ideas that's floated around for a while in Oregon is whether we need a standard for a rural school speed zone (in locations where few walk or bike to school) of 35 MPH like at least one other state ([Texas](#)) has.

Cindy said there's another move rising in Marion County to ask the Legislature to change the law to permit school speed zone flashers flashing all day. She said the school speed zones the County has put up in response to the June 2013 tragedy have not significantly changed the speeds traveled in those zones.

Energy around the whole subject was high and elicited a lot of further discussion. A number of familiar issues regarding school speed zone laws and history, and arguments pro and con -- the status quo and change -- continued. Discussion turned to an idea Joe had as to whether there is a method to set up a pilot project to set rural school speed limits of around 35 MPH. Cindy said a statutory rural school speed different than the 20 MPH school speed would require legislative action and it might be better to try to set designated 35 MPH speed limits with an investigation and without the SCHOOL rider on the speed sign. The possibility of setting temporary speed limits with flashing lights included was discussed along with other variations.

The committee coalesced around the idea of further discussion regarding possibly a research project by a subcommittee of volunteers outside the committee schedule. Doug suggested also convening the Speed Zone Review Panel to look at drafting a letter to the Attorney General regarding legal issues under the current ORS. Joe, Cindy, Julia, Jim and Brian (if it doesn't conflict with his role on the SZRP) said they'd be interested in serving on the subcommittee. Gary was volunteered to organize the action. Kevin advised if a legislative concept came out of the subcommittee, it would have to be carried by a LOC or AOC entity because ODOT officially cannot take a position on any legislative initiatives.

There was discussion of where support and opposition might come from and for what reasons. Further discussion ensued on other things which might be considered by the subcommittee, including what other states are doing with their rural school zones. Doug

Bish pointed out many states have many different school zone laws so the MUTCD is general in what it says in order to allow for these differences. Kevin pointed out the Safe Routes to School program is still a critical element of school safety. Gary noted the funding is going to be changing for Safe Routes to School and there will no longer be a dedicated fund for that. Joe said it should still be a relatively inexpensive investment requiring mostly local labor to put it together. More discussion regarding current policy and legal requirements continued for a while longer. Joe Ed, Julia, Jeff and Mike Caccavano volunteered to invest more time in looking at the next draft of the Guide to School Area Safety.

### **Local Jurisdiction Issues - Discussion**

Curve Warning Marking on Pavement – Joe Marek said Clackamas County was going to experiment with curve warning markings on the pavement in areas where people keep leaving the road and crashing. He said he'd keep the committee apprised. Mike said there is a pooled fund study going on and markings in the roadway right now. He offered to give Joe contacts.

Post meeting update: The Traffic Control Devices Pooled-Fund study has a report, "Evaluation of Elongated Pavement Markings Signs". The report is available on the TDC-PFS web page at <http://www.pooledfund.org/Details/Study/281>.

The principal investigator for this one report was David A. Noyce and his contact info is in the report (page 87 of the report, 97 of the pdf document). There are also additional reports on various TCD evaluations at this web page.

### **Not On Agenda**

Bob Papp reported on possible legislation to close the medians on Interstate highways which ODOT is doing their best to get ahead of with proposed language for a bill. The current policy is medians of 60 feet or less should be closed. ODOT is trying to make the case for 80 feet or less be the new standard because if they want everything closed, we have at least 150 miles of median over 110 feet wide and it would be very expensive even if it's all just cable barriers.

Bob updated on the Trinity testing of ET 2000 Plus guardrails. They are only halfway through the testing. There are some accusations they're not testing the same guardrail shoe as the most recent version. ODOT has found only two reports of this variety of guardrail (of which ODOT has about 808 around the state) getting hit. Of the two which have been hit, they performed as they're supposed to.

Regarding the ARTS Program, Zahidul Siddique said the application is up on the [ARTS webpage](#) now. Applications should be submitted to the appropriate region contact. The consultant is still working on the hotspot process.



There is nothing pre-filed in the Legislature on autonomous or connected vehicles. However ODOT is [very involved](#) in this area of technology and plans this year to develop a clear policy and institutional position on connected and autonomous vehicles within the agency.

There is one pre-filed piece of legislation to increase the Interstate speed limit from 65 MPH to 70 MPH. It does not yet appear to have a lot of support. ODOT is not going to advocate for any changes in speed limits. We support the Governor's position on any transportation issues and he hasn't advocated any changes in speed limits. If the legislation already filed actually were to pass, ODOT would have to consider whether a new full Interstate speed study is needed to be sure all current 65 MPH speed limits are safe to be raised to 70 MPH.

There has been a legislative proposal for permanent photo radar by the City of Portland on high-crash corridors with high fatal and serious injury crashes. It's only geared towards Portland as drafted. No changes on red light photo law are currently being proposed.

### **Agenda Items for Future Meetings**

Forming Subcommittees for MUTCD Review

### **Adjournment**

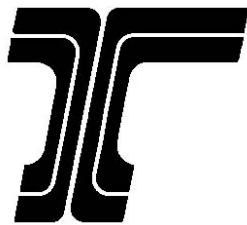
Jeff adjourned the meeting at 11:49 a.m.

Oregon Department of Transportation

Oregon Department of Transportation  
and  
Oregon Traffic Control Devices Committee

# Red Light Running (RLR) Camera Guidelines For State Highways

~~2012~~2015



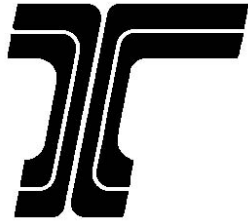
**OREGON DEPARTMENT of TRANSPORTATION**  
**TRANSPORTATION OPERATIONS DIVISION**  
**TECHNICAL SERVICES**  
**TRAFFIC MANAGEMENT SECTION**  
<http://www.odot.state.or.us/traffic>

-RLR Camera Guidelines 201~~2~~5

Oregon Department of Transportation

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Oregon Department of Transportation



Approved by the State Traffic-Roadway Engineer, in consultation with the Oregon Traffic Control Devices Committee for use on State Highways and adopted by the Oregon Traffic Control Devices Committee as a guide to assist Oregon cities in the deployment of Red Light Running (RLR) Cameras.

Bob Pappé  
State Traffic-Roadway Engineer

~~March~~December, 201~~5~~~~2~~

Oregon Department of Transportation

Major Revisions included in this version:

1. Revised Legislative Report requirement from “Regular Session” to “Odd-numbered year” to reflect legislative change in 2013.
- ~~1. New bullets in the Crash History requirements for the Safety and Operations Report~~
- ~~2. New Section – Future Changes to the Intersection~~
- ~~3. Various Changes in the section Procedure for State Highways to clarify the procedure~~
- ~~4. New section – Removal Procedure for Red Light Running Cameras~~
- ~~5. New Section – Conditions of Approval~~
- ~~6. New Appendix with web link to the Red Light Running Toolbox~~

Major Revisions included in previous versions:

1. New bullets in the Crash History requirements for the Safety and Operations Report
2. New Section- Future Changes to the Intersection
3. Various Changes in the section Procedure for State Highways to clarify the procedure
4. New section - Removal Procedure for Red Light Running Cameras
5. New Section – Conditions of Approval
6. New Appendix with web link to the Red Light Running Toolbox

~~1.7~~ Removed the requirement that the Oregon Department of Transportation provide an executive summary of evaluations of the systems to the Oregon Legislature.

~~2.8~~ Added a requirement that each city that operates cameras present an evaluation of the use and administration of the cameras to the Oregon Legislature.

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## **Red Light Running (RLR) Camera Guidelines**

### **Introduction**

This document has been prepared by the Oregon Department of Transportation (ODOT) and the Oregon Traffic Control Devices Committee (OTCDC) to assist local jurisdictions in the deployment of Red Light Running (RLR) Cameras on State Highways. Local jurisdictions should follow this guidance for installation of RLR cameras off state highways or develop their own guidance for application.

### **Supporting Legislation**

In response to what appeared to be a growing disrespect for traffic laws in general and disobeying red traffic signal indications in particular, the Oregon Legislature enacted a law in 1999 to help Oregon communities effectively enforce and reduce red light running. The law was revised and expanded several times since, the last time in 2007.

These guidelines are based on Oregon Revised Statutes (ORS) 810.434 through 810.436. The Oregon legislature last revised ORS 810.434 and 810.436 in 2007. Major revisions affecting these guidelines include:

1. Removing the requirement that Oregon Department of Transportation provide an executive summary of evaluations of the systems.
2. Adding a requirement that each city that operates cameras present an evaluation of the use and administration of the cameras.
3. Removing limitations on the numbers of cameras that may be installed in cities.

### **RLR Camera System Justification**

In 2007 almost 900 people were killed and an estimated 153,000 were injured in crashes that involved red light running in the US. About half of the deaths in red light running crashes are pedestrians and occupants in other vehicles who are hit by the red light runners. Studies have reported that red light cameras reduce angle and turning crashes, but can increase rear-end crashes. Because the types of crashes prevented by red light cameras tend to be more severe than rear-end crashes, research has shown there is also a reduction in the severity of crashes.

The Highway Safety Manual (published by AASHTO) quantifies the expected crash reductions of different measures. These measures are only included if there is known statistical stability and reliability. The Highway Safety Manual<sup>1</sup> lists the expected crash effects for installation of red-light cameras as a 26 percent crash reduction in right-angle and left-turn crashes and an 18 percent increase in rear-end crashes.

<sup>1</sup>Council, F.; Persaud, B.; Eccles, K.; Lyon, C.; and Griffith, M. 2005. Safety evaluation of red-light cameras: executive summary. Report no. FHWA HRT-05-049. Washington, DC: Federal Highway Administration.

RLR Cameras are not a panacea for intersection safety problems and should be installed only after other means have failed to solve the problems (see appendix A - RLR Toolbox). RLR Cameras have the potential to reduce the number and severity of crashes, but because of the concern for increasing rear-end crashes, RLR Cameras should be installed only where a crash problem within the last 5 years can be documented. When used, they should be a part of a process that considers education, enforcement and engineering, which are essential to any traffic safety program. Enhanced traffic safety is the principal aim of RLR Camera enforcement programs.

The following are means of improving intersection safety prior to RLR Cameras the jurisdiction should consider:

- (1) Proper sight distance;
- (2) Speed zones are consistent with engineering practice;
- (3) The number, size and location of vehicle heads are consistent with the MUTCD and ODOT's "Traffic Signal Policy and Guidelines";
- (4) Proper yellow change and red clearance intervals are consistent with ODOT's "Traffic Signal Policy and Guidelines" or other jurisdiction's adopted policy;
- (5) Corridor progression timing does not contribute to red light running;
- (6) Enforcement "tattle-tale" lights; and
- (7) The traffic signal timing is consistent with traffic volume, speed and specific intersection design elements.

### **RLR Camera System Implementation**

RLR Cameras monitor both the flow of traffic at the stop location and the condition (or color) of the traffic signal indication on the approach. Special detectors, commonly loops cut into the pavement, check for the passage of vehicles into the intersection and if the traffic signal phase condition is red, cause pole mounted cameras to record pictures of the vehicle position, license plate and driver. Upon verification by a police officer, the vehicle owner is issued a citation through the mail. RLR Camera systems should differentiate between vehicles running a red light and those vehicles stopping slightly beyond the stop bar or those vehicles, after stopping, making a legal turn against a red indication.

Typically RLR Camera Systems are installed under contract, by a commercial firm that specializes in such systems. These contracts cover the furnishing, installation and operation of the RLR Cameras. The firm may also prepare the evidence for verification by local law enforcement and mail the citation. As compensation, the firm usually collects a predetermined fee for this service when the citation fine is received.

Costs that the local jurisdiction must cover include internal expenses for engineering plan review, site evaluation and field engineering during the installation phase of the RLR Camera System. Local jurisdictions also can purchase, install and operate RLR Camera Systems or can enter into agreements with other jurisdictions to provide all or a portion of this service.

**If the candidate location is at a state highway intersection or on a state highway approach, application to and approval of the Oregon Department of Transportation is required.**



### **Public Information Campaign and Sign Requirements**

Oregon Law requires that cities provide a public information campaign to inform local drivers about the use of RLR Cameras before citations are actually issued. Educating the public is a critical step in reducing red light running. In order to effectively change poor driving habits, drivers must be made aware that RLR Cameras are in use. It is recommended that cities hold well-publicized kickoff events and issue periodic press releases about the effectiveness of RLR Camera enforcement within their jurisdictions.

Oregon law also requires that signs be posted, so far as practicable, on all major routes entering the jurisdiction indicating that compliance with traffic control devices is enforced through cameras. The law further requires that signs indicating that a camera may be in operation be posted near each intersection where a camera is installed.

Signs should be of appropriate size so as to be easily readable at the posted speed. Signs should be placed in such a manner that the motorist can easily see them, without undue visual clutter or obstruction.

### **Operational Considerations**

- RLR Cameras shall not affect the display or the operation of the traffic signal.
- Power for RLR Camera equipment may be provided from the traffic signal cabinet and should be on its own clearly identified circuit breaker.
- Contact closures, as may be required for red and yellow indications on RLR Camera approaches, should be electrically isolated from traffic signal equipment.
- Detection loops for RLR camera equipment should not be wired through the traffic signal cabinet, associated electrical conduit, or junction boxes and shall not interfere with the operation of detector loops used for traffic signal operation. At state highway intersections, segregated wiring is required.
- Traffic signal timing changes shall not be made to increase the possibility of vehicles running red lights. If a review of traffic signal timing prior to RLR Camera installation identifies inappropriate yellow change and red clearance interval values that require adjustment, these adjustments shall be made prior to operation of the RLR Camera system.
- Traffic signal timing changes may be made in response to substantial changes in approach speed, significant changes to traffic patterns, routine timing reviews, design changes, etc.
- Plans showing the location of all proposed and existing equipment shall be prepared.
- Signs at each City Limit, informing the public that compliance with traffic control devices is enforced through the use of cameras, shall be provided if not already in place. A RLR Camera sign on each covered approach shall be installed and should be shown on or as an attachment to the signal plans. Refer to the *Manual on Uniform Traffic Control Devices* and the Oregon Adopted Supplements for guidance on signs that should be posted.

### **Site Considerations**

RLR Cameras may not be appropriate at locations where:

- Recent geometric or traffic signal design changes have been made. Supporting crash records may not be applicable in the new configuration.
- Traffic signals have been installed within the previous year. Crash history may be too short to support RLR Camera use.
- Geometric or traffic signal design changes are scheduled and an engineering evaluation indicates such changes may substantially alter the need for RLR Camera enforcement.
- Road or utility work is anticipated during the first year of RLR operation.
- Traffic pattern changes resulting from development, construction detours or similar events are anticipated during the first year of RLR operation.
- An electrical interconnect with “railroad active warning devices” is provided on the approach.
- Design, operation or maintenance is inconsistent with state or local standards and practices.

### **Safety and Operations Report**

A Safety and Operations Report is required for all RLR Camera Systems to be installed at intersections on state highways and is strongly recommended for all other locations since it can provide the basis for the process and outcome evaluation required in ORS 810.434(3)(b). It may be desirable to secure the services of a Professional Engineer to conduct the necessary study.

In addition to a general project narrative, the Safety and Operations Report should address to the extent practical the following:

**Crash History** - An engineering study of the crash experience at the intersection should be conducted.

- Target crashes for reduction at a RLR installation are angle crashes where the driver of one of the vehicles disregarded the traffic control device. Oregon crash records include codes for driver error and crash cause that describe these crashes (code for Participant Error code 020: “DISREGARDED TRAFFIC SIGNAL” and Crash Cause code 04: “DISREGARDED R-A-G TRAFFIC SIGNAL”).
- Target crashes coded to driver attention may also be included in the study.
- The study should identify the relative crash problem of the intersection and each approach or movement of the intersection based on nearby intersections of similar volume, geometry, and traffic control.
- The study shall identify the approaches and movements to the intersections the applicant is requesting to be monitored by a RLR camera.
- Approaches should be those that have target crashes identified.
- Right turn approaches may have a high rate of violation but typically result in low severity or low crash occurrence and should not be included unless there is associated evidence of a significant crash history of high severity.

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Safety Concerns - Documentation detailing other safety concerns may be included in the report.

Concerns may be supported by any of the following (or other relevant data):

- Traffic citation data
- Complaints
- Enforcement observations
- Speeds, traffic volumes and grades
- Traffic signal spacing
- Proximity to freeway or expressway ramp terminals

Design, Operations, and Maintenance Issues –Copies of signal plans showing the location of all proposed and existing equipment should be included. A description of how the RLR Camera System will be operated and maintained should be provided. Any design, operations, or maintenance issues that could affect the potential effectiveness of a RLR Camera System should be identified.

Public Information Campaign – The public information requirements as outlined in ORS 810.434 (3)(a) should be addressed.

Budget – A budget for system implementation and operation should be developed.

PE Certification – The jurisdiction proposing to install a RLR Camera System should secure the services of a Professional Engineer (PE) to attest that the traffic signal is operated and maintained in accordance with the MUTCD and appropriate state and local guidelines. This certification should be made available to the enforcing jurisdiction.

### **Future Changes to the Intersection**

While every effort should be made to determine appropriate modifications and changes to the signal system prior to the installation of RLR cameras, land use and traffic patterns may change over time. Such changes may require a road authority to make changes to the signal system that may impact the operations of the RLR Cameras equipment. At no time shall the presence of RLR cameras obstruct an agency from making necessary changes to improve the safety of the driving public or the operation of the traffic signal.

When problems affecting the safety of the public arise (whether part of the signal system or are attributed to the operation of the RLR cameras) and traffic solutions to improve geometry, remove or add lanes or change the operational characteristics of the signal system are identified, the RLR camera operations and the associated costs of changing the RLR cameras shall not be taken into account as the reason for not making such changes. Any changes to the RLR cameras and associated costs shall be the responsibility of the commercial firm under contract for operation of the RLR cameras and the jurisdiction overseeing the operation of the RLR camera system, depending on their agreements.

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### **Biennial Report Requirement**

Oregon Law requires that once each biennium all cities using RLR Camera Systems must conduct a process and outcome evaluation that includes:

- The effect of the use of cameras on traffic safety
- The degree of public acceptance of the use of cameras
- The process of administration of the use of cameras

Regardless of the jurisdiction in the position of road authority, the jurisdiction overseeing the operation of a RLR Camera System shall prepare the Biennial Report and submit the report by March 1st of the year of each regular session to the Legislative Assembly. The Biennial Report should include the following information:

- Name, address, and phone number of person who will be the main RLR contact for this jurisdiction.
- Date of implementation.
- Number of intersections at which RLR Cameras are installed.
- RLR contractor name.
- Crash data specific to RLR locations for the 3-year period prior to RLR Camera installation and post RLR camera installation data to identify average crash rate and annual change.
- Public information surveys (if available) regarding jurisdiction's use of RLR Cameras.
- Copies of media releases sent as a part of the public RLR awareness program.
- Description of areas of concern or difficulty in administering the RLR Camera enforcement program.
- Available information on the local courts ability to handle the increase in citations.
- "Success stories" to share with the legislature about local RLR program such as major reductions in serious injuries and fatalities in the local jurisdiction due to RLR Camera systems.

Each city that operates a camera system is responsible for presenting a report to the Legislative Assembly by March 1<sup>st</sup> of the ~~odd-numbered~~ year ~~of each regular session~~.

### **Approval Procedure for State Highways**

State Traffic-Roadway Engineer approval is required for RLR Camera installation and operation at all State-owned intersections regardless of operation or maintenance responsibilities. The following procedure should be followed:

- The Applicant:
  - Submits letter to ODOT Region requesting authorization to install and operate a RLR Camera at a specific State-owned intersection and specific movements monitored.
  - The letter shall identify a responsible party to whom an ODOT permit will be issued and the point of contact responsible for the construction, operation, and public information requirements.
  - The letter shall be accompanied by:
    1. The Safety and Operations Report.

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2. A statement of consistency with the Operational Considerations.
  3. A statement of agreement with the Conditions of Approval
- Region Traffic:
    - Reviews RLR design and supporting documents and works with applicant to ensure the RLR Camera Enforcement Installation Checklist (see page 11) is complete.
    - If supportive of the proposal, prepares all documents for the State Traffic-Roadway Engineer with a recommendation to approve.
    - Receives State Traffic-Roadway Engineer response of approval or denial of the RLR camera and any conditions.
    - Leads development of an Intergovernmental Agreement (IGA), laying out terms of agreement as to the responsibilities and obligations of each jurisdiction for the RLR camera.
  - The District Office:
    - Establishes an account number through ODOT Financial Services identifying responsible party and budget in an Order to Render Service.
    - Establishes the amount of deposit to be paid by the applicant. If cost are more than the deposit the applicant will charged for the additional cost, if less then reimbursed.
    - Issues Miscellaneous Permit to applicant stating conditions of approval. Conditions include the need for State Traffic-Roadway Engineer approval.
  - The Applicant:
    - Signs the permit, acknowledging the conditions of approval.
    - Agrees to pay for all actual costs incurred by ODOT relating to the installation, inspection, or repair, and any incidental costs.
    - Pays a monetary deposit as determined by the District office. Below are examples of typical costs and services:
      1. Plan review by the Traffic-Roadway Section estimated between \$200 to \$1000 per RLR Camera installation.
      2. Traffic signal cabinet and intersection modifications required to protect ODOT equipment and provide proper communication to RLR equipment estimated at \$1000 per intersection.
      3. Sign installation estimated at \$200 per sign, \$600 for sign and post.
      4. Relocation or repair of existing traffic control devices resulting from the installation of RLR equipment (costs are based on time and materials plus any damages).
      5. Inspection of installation estimated between \$200 and \$1000.
  - The District Office:
    - Upon receipt of signed permit and deposit, forwards plans and supporting documents to the Region Traffic Manager.
    - Notify the Electrical Crew responsible for the traffic signal and arranges for inspections of permit work.

State Traffic-Roadway Engineer approval will be based on review of supporting documents and completion of final, ODOT approved plans and may stipulate further conditions of approval. The State Traffic-Roadway Engineer will specify which movements are approved to receive RLR Cameras.

### **Removal Procedure for State Highways**

When considering removal of a RLR camera, a study should be performed to determine if the RLR Camera should be removed or remain. A RLR camera may be ordered removed by the State Traffic-Roadway Engineer for an intersection or a particular approach to an intersection or a particular movement at an intersection.

If for instance the study shows there is little or no reduction in the number, severity or targeted crashes (i.e., angle crashes) or if similar results can be obtained from engineering countermeasures such as improving sight distance, conspicuity of the signal heads, signal timing or installation of “tattle tale” lights the Region Traffic Engineer may recommend removal to the State Traffic-Roadway Engineer.

Intersections where engineering or geometric improvements are proposed may require study of the new intersection geometry and may result in a request to remove RLR camera equipment. The study may include a determination of changes in conflicts, phasing changes to traffic signals, addition of turn lanes or diversions of traffic patterns that change the operations of the traffic signal.

The following procedure should be followed when considering removal of RLR cameras:

- ODOT Region Traffic shall conduct a study.
  - The study shall determine the safety effectiveness of the RLR camera at reducing crashes, severity of crashes and/or types of crashes (especially as they relate to angle crashes vs. rear-end crashes).
  - The study shall recommend continued operation of the camera, removal of the camera and/or modifications to the operation of the camera or intersection.
  - Other safety concerns such as changes in violations and compliance rates may be considered but are not the primary measure of safety.
  - The study shall also consider the extent to which other countermeasures had been implemented prior to implementation of the RLR cameras or proposed changes to the intersection.
  - Other considerations may include traffic volumes and delay, unusual or unique geometry, signal timing, operation and cycle lengths, driver behavior, and other engineering countermeasures to improve safety.
  - The study shall include any proposed changes to the intersection such as engineering or geometric improvements that reduce or eliminate conflicts or change the operations of the traffic signal.
- If the recommendation is to remove the RLR Camera, ODOT should work together with the Jurisdiction responsible for the RLR cameras to come to agreement for how to proceed with the recommendations of the study.
- Additional input may include the public and/or enforcement to determine support or opposition to the removal.
- Whether or not an agreement can be reached, ODOT Region Traffic will submit a recommendation to the State Traffic-Roadway Engineer along with the study.
- The Jurisdiction responsible for the RLR camera may submit a recommendation with supporting

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documentation to the State Traffic-Roadway Engineer.

- The State Traffic-Roadway Engineer decisions will be based on review of the study, the recommendations submitted and any other input received.
- The State Traffic-Roadway Engineer may hold a meeting of interested parties to go over the issues.

The State Traffic-Roadway Engineer may approve removal of the RLR Camera, may approve the RLR camera remaining, and/or require engineering countermeasures or other changes to the intersection or roadway or cameras. The State Traffic-Roadway Engineer's decision is final and will be based primarily on safety.

Upon request of the jurisdiction responsible for the RLR Camera the State Traffic-Roadway Engineer may approve removal of the RLR Camera without study of the intersection. Typically this occurs under special conditions such as the vendor of the equipment goes out of business, a political entity passes an ordinance to remove the RLR Camera or other circumstances as determined by the State Traffic-Roadway Engineer.

## RLR Camera Enforcement Installation Checklist Non-State Highway

Location Information

File Code: \_\_\_\_\_

Acct. No.: \_\_\_\_\_

Street Name: \_\_\_\_\_

Intersecting Street: \_\_\_\_\_

RLR Camera Approaches: \_\_\_\_\_

Traffic safety need based on crash history and safety concerns has been documented.

A public information contact has been identified.

Contact Name: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_ Telephone: \_\_\_\_\_

Location approaches and movements have been clearly identified.

Traffic signal indications on the approach are clearly visible from an adequate distance based on field observation. Current MUTCD signal visibility standards are met.

Yellow change and red clearance intervals are displayed for at least the recommended time.

No significant improvement (project) is scheduled or planned that would substantially alter the need for a RLR Camera.

Signs indicating that compliance with traffic control devices is enforced through cameras are posted (or will be provided by this project) on all major routes entering the jurisdiction.

Signs indicating that a camera may be in operation will be posted on all approaches where a camera is to be installed.

No known reason why a RLR Camera should not be installed.

Checklist completed by: \_\_\_\_\_ Date: \_\_\_\_\_



## RLR Camera Enforcement Installation Checklist State Highway

Location Information File Code: \_\_\_\_\_

TSSU Location ID: \_\_\_\_\_ Region: \_\_\_\_\_ District: \_\_\_\_\_ Acct. No.: \_\_\_\_\_

Street Name: \_\_\_\_\_

Intersecting Street: \_\_\_\_\_

RLR Camera Approaches: \_\_\_\_\_

Applicant (City/County): \_\_\_\_\_

- Local jurisdiction has documented traffic safety need based on crash history, and safety concerns.
- A local jurisdiction point-of-contact has been identified.

Contact Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Address: \_\_\_\_\_ Telephone: \_\_\_\_\_

- Location and approaches have been clearly identified.
- Traffic signal indications on the approach are clearly visible from an adequate distance based on field observation. Current MUTCD signal visibility standards are met.
- Yellow change and red clearance intervals are displayed for at least the recommended time.
- Existing traffic signal coordination with adjacent traffic signals is in place and properly timed.
- No significant improvement (project) is scheduled or planned that would substantially alter the need for a RLR Camera.
- Signs indicating that compliance with traffic control devices is enforced through cameras are posted (or will be provided by this project) on all major routes entering the jurisdiction.
- Signs indicating that a camera may be in operation will be posted on all approaches where a camera is to be installed.
- No known reason why a RLR Camera should not be installed.

Checklist completed by: \_\_\_\_\_ Date: \_\_\_\_\_

### **Conditions of Approval**

The applicant agrees:

1. The cost of any required changes to the RLR camera equipment as a result of changes or modifications to the intersection, regardless of who implements the changes, shall be the responsibility of the applicant and/or any commercial firm under contract for operation of the RLR cameras.
2. When problems affecting the safety of the public arise whether part of the signal system or the RLR cameras, ODOT has the discretion to modify geometry, remove or add traffic lanes or change the operating characteristics of the intersections to protect the safety of the public, up to and including the ordering of the removal of the RLR camera systems or the removal of cameras for particular movements.
3. When ODOT desires to modify an intersection with a RLR camera to improve operations or safety it may do so without consideration to the cost of changes to the RLR camera system or impact to revenue generation on RLR camera system or agreements between the applicant and any commercial firm operating the camera system. ODOT shall not be subject to any costs for changes, modifications, or removals of the RLR camera system.
4. Applicant shall make available to ODOT all reasonable requests for records concerning the operations of the RLR cameras and the intersection, including but not limited to, number of violations by particular cameras or movements, total violations, distribution of violations, percentages of violations within specific time periods, crash records and/or operating parameters of the RLR camera.
5. Applicant shall ensure that signs at each City Limit, informing the public that compliance with traffic control devices is enforced through the use of cameras, are provided if not already in place. A RLR Camera sign on each covered approach shall be provided and shown on or as an attachment to the signal plans.
6. Applicant shall ensure a method for ODOT staff to turn off the camera system to perform routine maintenance of the signal system, including cabinet or controller replacement or timing changes.
7. Failure to comply with any of the conditions of approval listed herein or stipulated by the State Traffic-Roadway Engineer shall be sufficient reason for the State Traffic-Roadway Engineer to order removal of the RLR camera system.

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Appendix A – Red Light Running Toolbox

See the following website:

<http://safety.fhwa.dot.gov/intersection/resources/fhwasa09027/resources/Making%20Intersections%20Safer%20-%20A%20Toolbox%20of%20Engineering%20Count.pdf>

# OREGON TRAFFIC CONTROL DEVICES COMMITTEE

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as of March, 2015

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