Traffic Safety Cameras

Division Chief Joseph Montoya
Denver Police Department

Ted Porras
Denver Police Department

David DiGiacomo
Department of Transportation & Infrastructure

Outline

I. Request
II. Program History & Operations
III. DOTI : Safety Countermeasures
IV. Vision Zero
V. Photo Citation Process
VI. Q&A

Request

22-0159: Approves a contract with American Traffic Solutions, Inc. d/b/a Verra Mobility for $5,660,000 from 3/1/22 – 2/28/2027 for photo radar and photo red light services citywide.

A supporting resolution was submitted this week for a contract extension with the current vendor, Conduent State & Local Solutions, Inc., for an additional $300,000 and a new end date of 8/31/2022 to allow for the transition to the new vendor.

This contract is funded through the Department of Safety's approved annual General Fund budget allocation.

Program History

Speed Safety Camera *
program started in November 1998

Red Light Safety Camera *
program started in July 2008

** Federal Highway Administration (FHWA) updated terminology*

New Contract Improvements

- New Vendor : **Verra Mobility**
- New Technology
  - Improved day-time & night-time images
  - Real-time data tracking
  - Infra-Red flash technology
- Option to expand with additional approvals and funding
- Public Information Campaign
  - Social Media (Facebook, Twitter, LinkedIn, YouTube)
  - FAQ Brochure Inserts
  - PSA Video

New Technology

Speed Safety Camera Overview

- Speed Safety enforcements operate on a 2-shift, 7-day a week schedule

- 4 Speed Safety vehicles enforcing for each shift during the week
- 2 Speed Safety vehicles enforcing for each shift during the weekend

- Enforcements limited by state statute to:
    - Residential 35MPH or less
    - Streets Bordering Parks
    - Safety Zones (School Zones &Work Zones)

- Fines are set by Statute at $40.00 and $80.00 in Safety Zones (fines doubled)

Speed Safety Camera Deployment

- A Speed Safety Agent is ALWAYS in the van during enforcement
- Photo Radar In Use Sign (PRS) is required 300’ from van

Speed Safety Camera Deployment

- RADAR equipment is calibrated annually and tested for accuracy before and after each enforcement
- Citations are issued to only 1 vehicle at a time
- 808 possible enforcement locations; about 150 locations are actively enforced
- Reactive to citizen complaints & proactive at new locations
- Coordinate enforcement efforts with Neighborhood Enforcement Team (NET) and District Stations
- Work Zone enforcements are coordinated with construction companies and CDOT
- ALWAYS enforcing at School Zones when school is in session

Speed Violation Reduction

DECREASE in Citations Issued at commonly enforced locations
(VPH - average violations per hour)

	2015	2019	
▪ E. 1st Avenue	6.63 vph	2.15 vph	68% decrease
▪ S. University Boulevard	5.74 vph	2.32 vph	60% decrease
▪ Colorado Boulevard	6.83 vph	1.01 vph	85% decrease

Speed Violation Reduction

DECREASE in Citations Issued at School Zones
(VPH - average violations per hour)

	2015	2019	
▪ Greenlee Elementary	4.75 vph	1.14 vph	76% decrease
▪ Good Shepherd	4.76 vph	1.16 vph	76% decrease
▪ Mt. Saint Vincent	7.33 vph	0.82 vph	89% decrease

Red Light Safety Camera Overview

- 4 Photo Red Light Intersections
    - E. 6th Avenue & Kalamath Street E/B
    - E. 6th Avenue & Lincoln Street E/B
    - W. 8th Avenue & Speer Boulevard W/B
    - E. 36th Avenue & Quebec Street N/B
- Incidents are detected 24/7
- Fines are set by State Statute* at $40.00 for stop-bar violations and $75.00 for through violations.

* CRS 42-4-110.5 Automated Vehicle Identification Systems

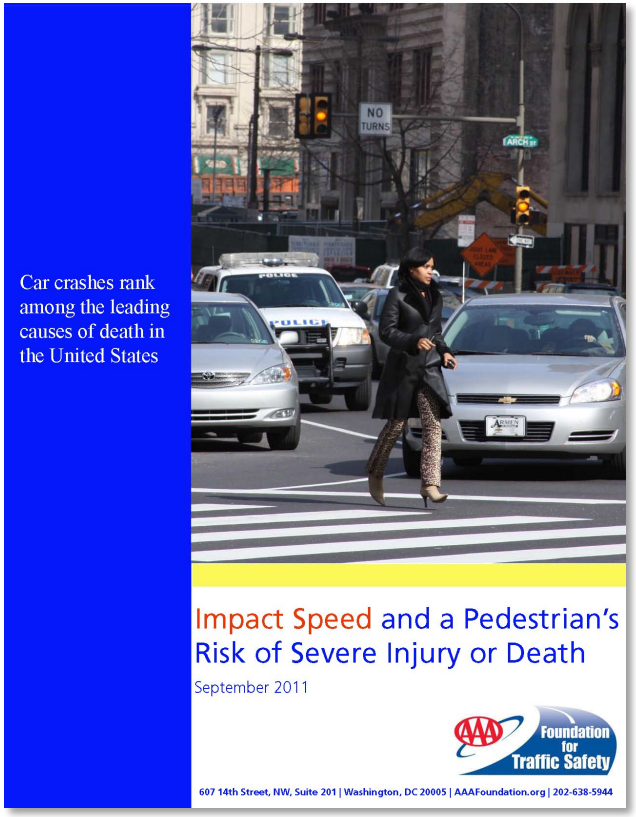
Red Light Violation Reduction

DECREASE in Citations Issued at each enforced location

	2015	2019	
▪ E. 6th Ave. & Kalamath St.	6,497	5,122	21% decrease
▪ E. 6th Ave. & Lincoln St.	11,263	7,521	33% decrease
▪ W. 8th Ave. & Speer Blvd.	1,768	1,133	36% decrease
▪ E. 36th Ave. & Quebec St.	9,856	7,701	22% decrease

Vehicle Crashes

Speed & Safety



Speed & Safety

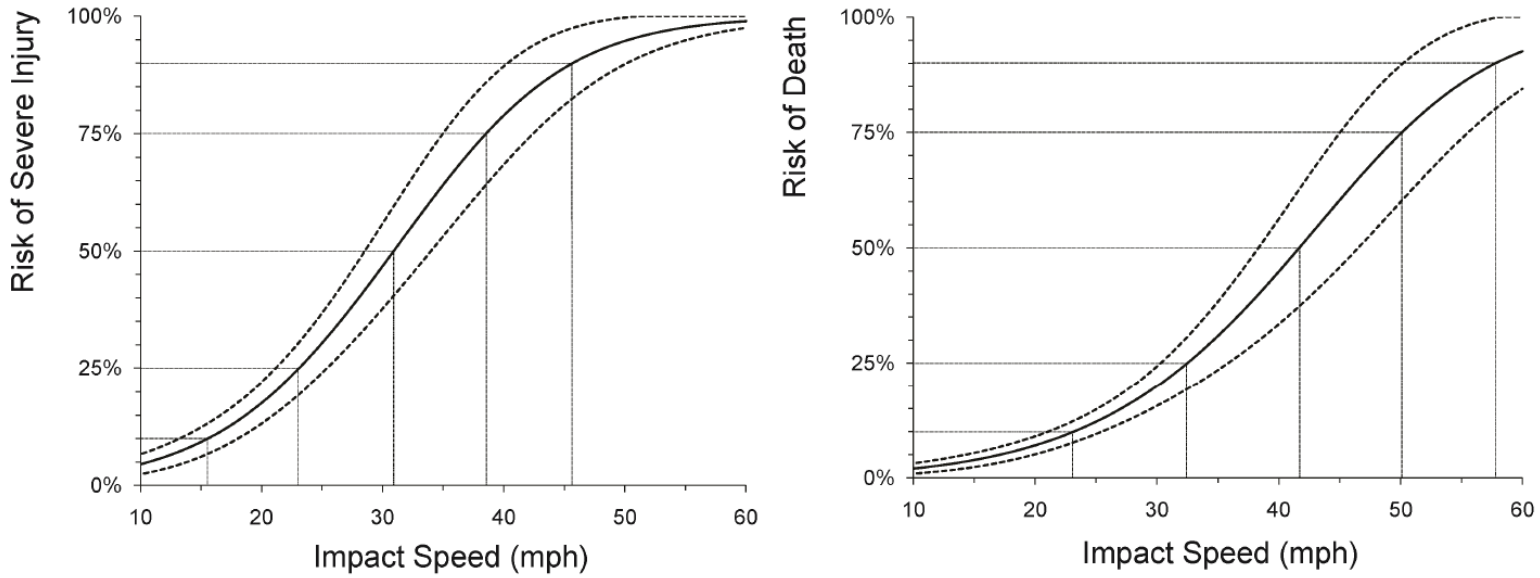


Figure 1. Risk of severe injury (left) and death (right) in relation to impact speed in a sample of 422 pedestrians aged 15+ years struck by a single forward-moving car or light truck model year 1989–1999, United States, 1994–1998. Risks are adjusted for pedestrian age, height, weight, body mass index, and type of striking vehicle, and standardized to the distribution of pedestrian age and type of striking vehicle for pedestrians struck in the United States in years 2007–2009. Dotted lines represent point-wise 95% confidence intervals. Serious injury is defined as AIS score of 4 or greater and includes death irrespective of AIS score.

Speed & Safety

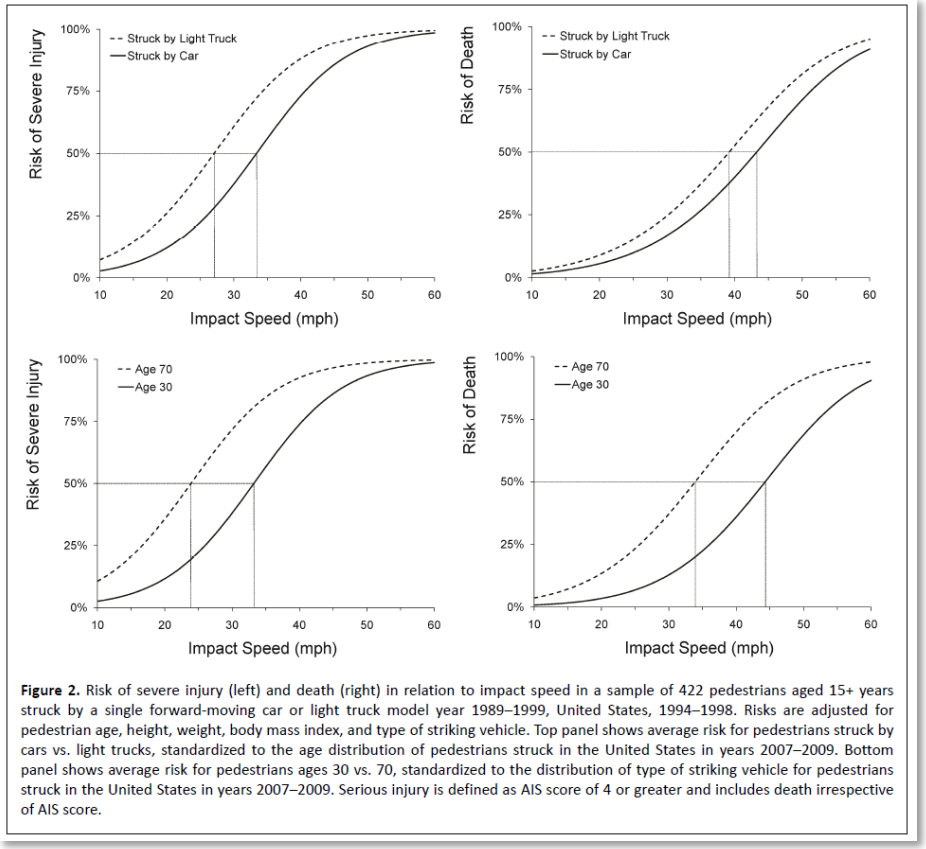


Figure 2. Risk of severe injury (left) and death (right) in relation to impact speed in a sample of 422 pedestrians aged 15+ years struck by a single forward-moving car or light truck model year 1989–1999, United States, 1994–1998. Risks are adjusted for pedestrian age, height, weight, body mass index, and type of striking vehicle. Top panel shows average risk for pedestrians struck by cars vs. light trucks, standardized to the age distribution of pedestrians struck in the United States in years 2007–2009. Bottom panel shows average risk for pedestrians ages 30 vs. 70, standardized to the distribution of type of striking vehicle for pedestrians struck in the United States in years 2007–2009. Serious injury is defined as AIS score of 4 or greater and includes death irrespective of AIS score.

Intersection Safety & Red-Light Running

6 BRIEFS ISSUE

Engineering Countermeasures to Reduce Red-Light Running

Red-Light Running Defined

There is no simple or single reason to explain why drivers run red lights, but beginning with a definition will provide a framework for discussion. The simplest definition of red-light running (RLR) is the act of entering, and proceeding through, a signalized intersection after the traffic signal has turned red. According to the Uniform Vehicle Code (UVC)[1], a motorist "...facing a steady circular red signal shall stop at a clearly marked stop line, but if none, before entering the crosswalk on the near side of the intersection, or if none, then before entering the intersection and shall remain standing until an indication to proceed is shown..." (§11-202). An intersection is defined in the UVC as "... the area embraced within the prolongation or connection of the lateral curb lines, or if none, then the lateral boundary lines of the roadways of two highways which join one another at, or approximately at right angles, or the area within which vehicles traveling upon different highways joining at any other angle may come in conflict" (§1-132). See Figure 1.

Figure 1: Diagram of UVC definition of an intersection

Red-Light Running Fatalities

FHWA identified the following four elements from the Fatality Analysis Reporting System that provide a consistent definition of red-light running fatalities.

- The crash occurred at an intersection or was intersection-related;
- The intersection was controlled by an active traffic signal;
- A driver was charged with either failing to stop for a red signal or failing to obey a traffic control device; and
- A driver was going straight at the time of collision.

On average, during the 2000 to 2007 period, 916 annual RLR fatalities have resulted. In 2007, 883 RLR fatalities have occurred. This represents a reduction of 33 RLR fatalities or approximately 3.5 percent as compared to the most recent five-year average. A chart illustrating the RLR fatalities between 2000 and 2007 is shown in Figure 2.

1. National Committee on Uniform Traffic Laws and Ordinances (NCUTLO). *Uniform Vehicle Code*. 2000.

U.S.Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Investment in roadway safety saves lives

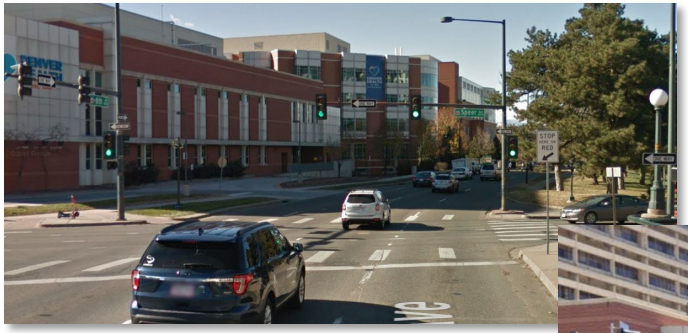
FHWA-SA-10-005

ENGINEERING COUNTERMEASURES TO REDUCE RED-LIGHT RUNNING November 2009

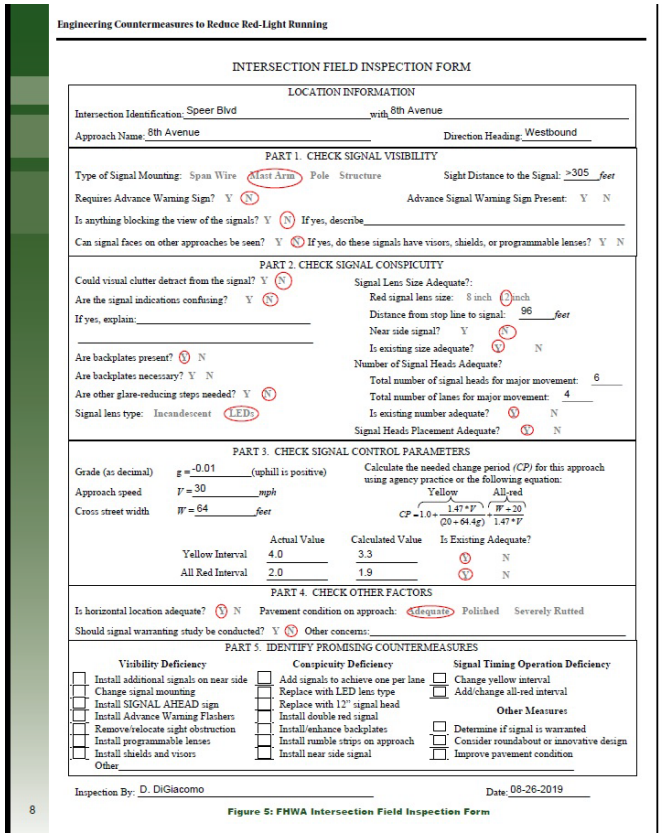
Engineering Counter measures:

- Increase Signal Visibility
  - Modify placement of signal heads
  - Increase size of signal displays
  - Install visors
  - Install LEDs
- Remove Reasons for Intentional Violations
  - Adjust yellow change interval
  - Provide all-red clearance interval
  - Adjust signal cycle length
  - Provide dilemma zone protection with advance vehicle detection
- Eliminate the Need
  - Modify placement of signal heads
  - Increase size of signal displays
  - Install visors
  - Install LEDs

Speer Blvd. & 8th Avenue



Field Inspection Example



Engineering Countermeasures to Reduce Red-Light Running

INTERSECTION FIELD INSPECTION FORM

LOCATION INFORMATION

Intersection Identification: Speer Blvd with 8th Avenue

Approach Name: 8th Avenue Direction Heading: Westbound

PART 1. CHECK SIGNAL VISIBILITY

Type of Signal Mounting: Span Wire (Mast Arm) Pole Structure Sight Distance to the Signal: >305 *feet*

Requires Advance Warning Sign? Y (N) Advance Signal Warning Sign Present: Y N

Is anything blocking the view of the signals? Y (N) If yes, describe

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

PART 2. CHECK SIGNAL CONSPICUITY

Could visual clutter detract from the signal? Y (N)

Are the signal indications confusing? Y (N)

If yes, explain:

Are backplates present? (Y) N

Are backplates necessary? Y N

Are other glare-reducing steps needed? Y (N)

Signal lens type: Incandescent (LEDs)

Signal Lens Size Adequate?:

Red signal lens size: 8 inch (12 inch)

Distance from stop line to signal: 96 *feet*

Near side signal? Y (N)

Is existing size adequate? (Y) N

Number of Signal Heads Adequate?

Total number of signal heads for major movement: 6

Total number of lanes for major movement: 4

Is existing number adequate? (Y) N

Signal Heads Placement Adequate? (Y) N

PART 3. CHECK SIGNAL CONTROL PARAMETERS

Grade (as decimal) g = -0.01 (uphill is positive)

Approach speed V = 30 *mph*

Cross street width W = 64 *feet*

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

$$CP = 1.0 + \frac{1.47 * V}{(20 + 64.4g)} + \frac{(W + 20)}{1.47 * V}$$

(Yellow, All-red)

	Actual Value	Calculated Value	Is Existing Adequate?
Yellow Interval	4.0	3.3	(Y) N
All Red Interval	2.0	1.9	(Y) N

PART 4. CHECK OTHER FACTORS

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

Should signal warranting study be conducted? Y (N) Other concerns:

PART 5. IDENTIFY PROMISING COUNTERMEASURES

Visibility Deficiency	Conspicuity Deficiency	Signal Timing Operation Deficiency
☐ Install additional signals on near side	☐ Add signals to achieve one per lane	☐ Change yellow interval
☐ Change signal mounting	☐ Replace with LED lens type	☐ Add/change all-red interval
☐ Install SIGNAL AHEAD sign	☐ Replace with 12" signal head	**Other Measures**
☐ Install Advance Warning Flashers	☐ Install double red signal	☐ Determine if signal is warranted
☐ Remove/relocate sight obstruction	☐ Install/enhance backplates	☐ Consider roundabout or innovative design
☐ Install programmable lenses	☐ Install rumble strips on approach	☐ Improve pavement condition
☐ Install shields and visors	☐ Install near side signal	
Other		

Inspection By: D. DiGiacomo Date: 08-26-2019

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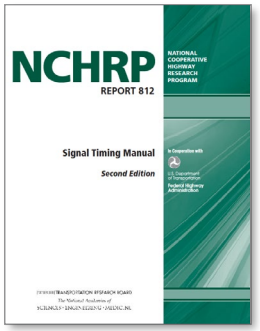
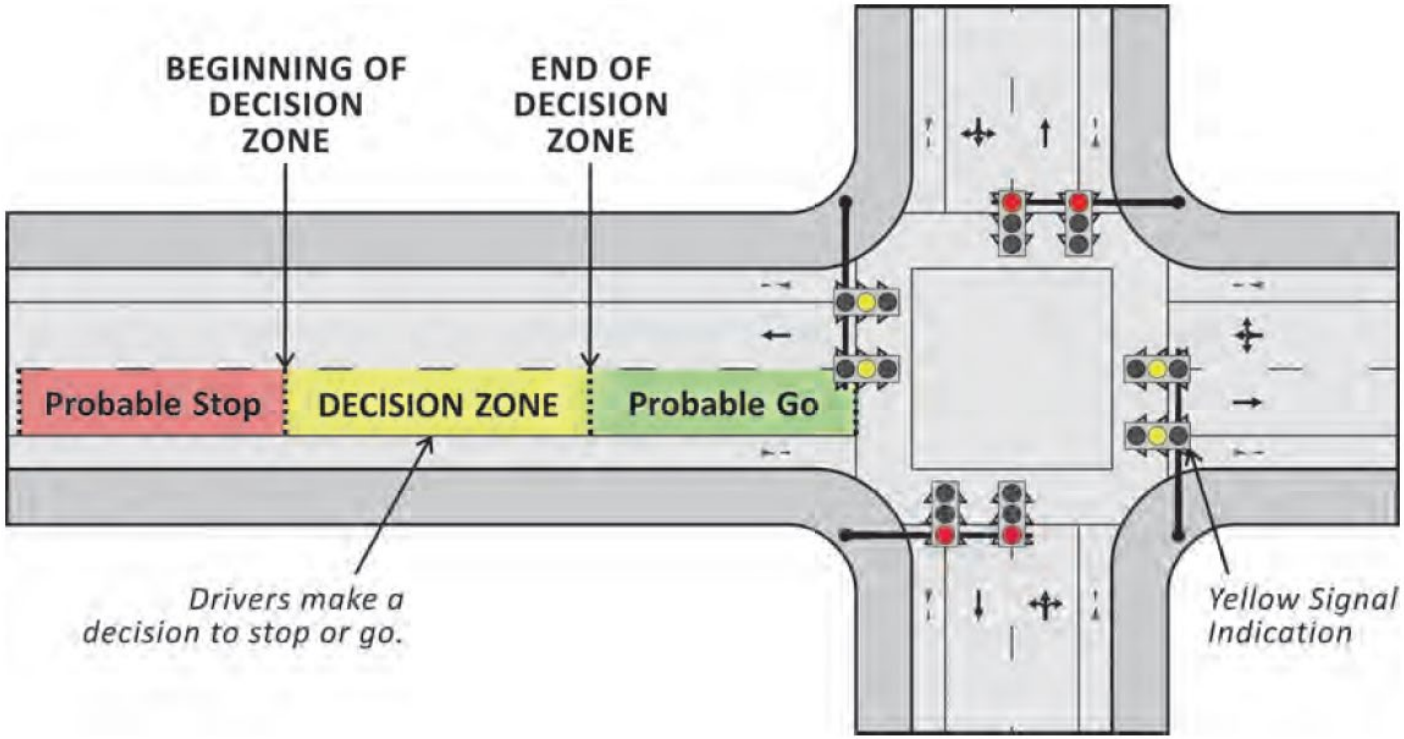
Figure 5: FHWA Intersection Field Inspection Form

Yellow Light Time

- Notify drivers that:
  - The green is about to end
  - The red is about to be displayed
  - The cross-street is about to display green

Yellow Light Time : The Dilemma Zone



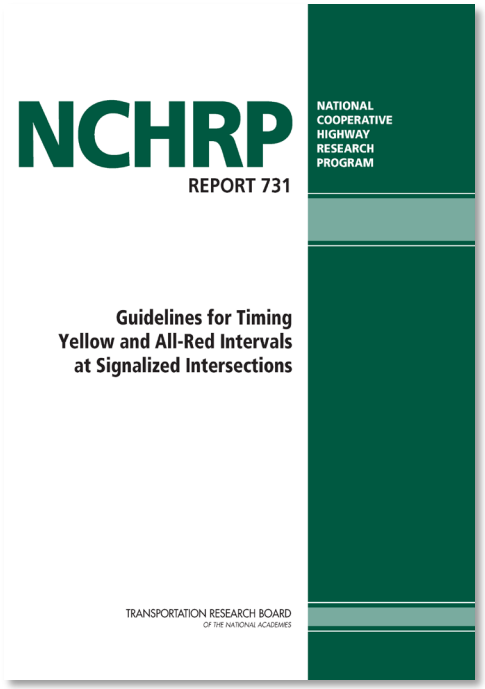


Yellow Light Time in Denver
A Quick History

- 2008
    - Photo enforced locations and handful of control locations updated to 1985 ITE Recommended practice.

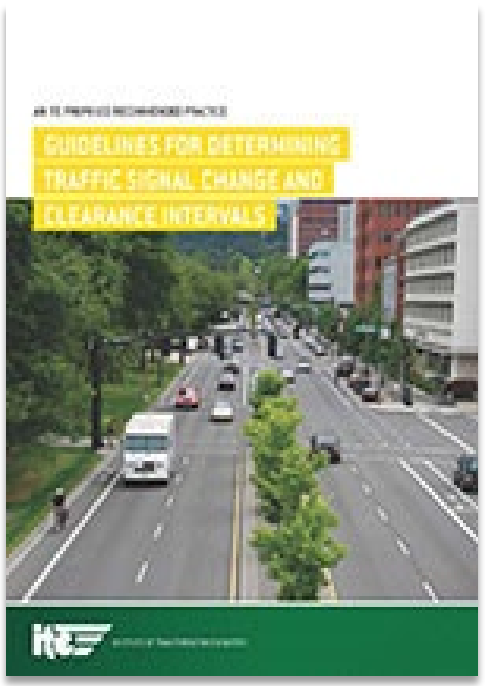
- 2011 to Present
    - All new, rebuilt and retimed traffic signals updated to 1985 using posted speed limit.

Yellow Light Research



2012

2014



2015

- A multi-national road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries in road traffic.
- Denver's Vision Zero commitment seeks to reduce fatal crashes consistently year-over-year.
- Specific action plans involving Photo Enforcement:
  - Provide enforcement programs
  - Provide pedestrian safety efforts
  - Provide committed speed enforcement in school zones

Other Progressive Cities

- Speed cameras were in operation in 155 U.S. communities in 16 states and the District of Columbia during 2020.
- During 2020, 345 U.S. communities operated red light camera programs.

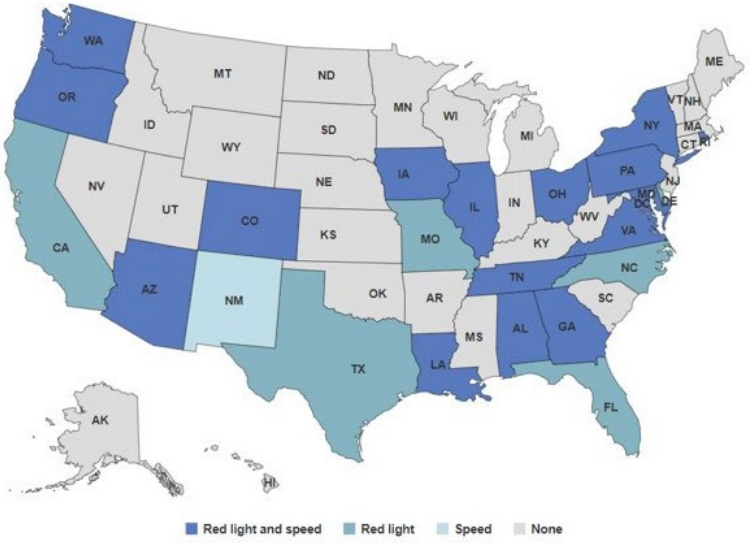
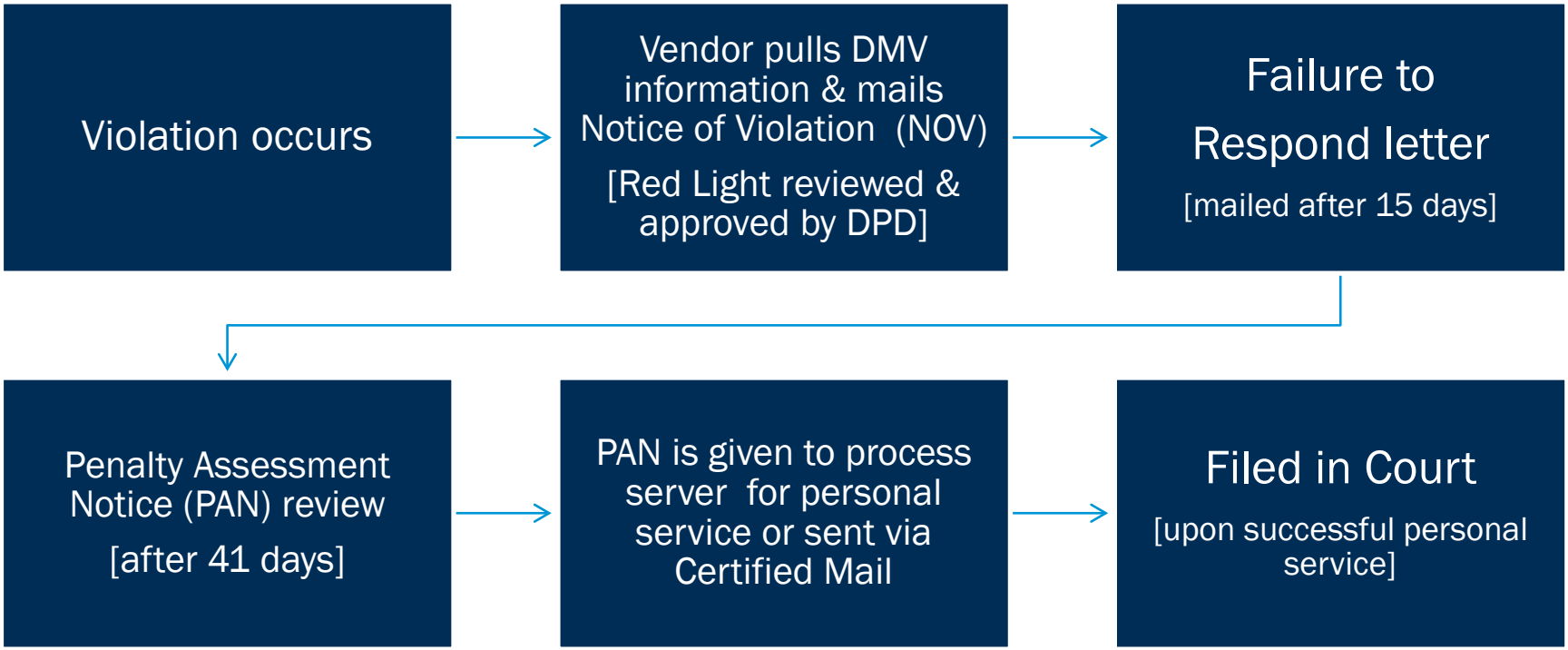


Photo Citation Process



Notable Facts

- Photo Enforcement has been used to help solve violent crimes across the State.
- Our program is used as a standard for other cities across the country.
- We are the only city in Colorado that provides their own customer service to the citizens.
- We have changed the driving habits of citizens in key locations including all 4 of our Red-Light intersections.

Thank you.

Questions?