THE PROBLEM OF RED LIGHT RUNNING
A Different Approach

Prepared by:
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The RLR Epidemic!

Annual Statistics…

- 200,000 injured
- Over 1,000 deaths
- Cost estimates are more than $1-billion
Traditional Remedies

• Engineering
• Education
• Enforcement - “Intuitive”
The Automated Enforcement Remedy

1. Detection Installed
2. Digital Images Recorded
3. Tickets Mailed to Violators
Our Different Approach

1. Identify candidate intersections
2. Install RLR monitoring equipment
3. Measure existing baseline compliance
4. Seek site-specific engineering solutions
5. Re-measure compliance rate
6. Conduct **selective** enforcement & a media campaign
7. Use automated enforcement
8. Periodically monitor compliance rate
Some Underlying Causes

- Inadequate Capacity
- Inappropriate Signal Timing
- Overall intersection geometry
- Pedestrian issues
- Intersection speed
- Weather impacts
- Seasonal impacts
- Excessive number of Trucks
Our Goals

- Reduce High Intersection Crash
- Improve Red Light Compliance
- Increase Enforcement Effectiveness
- Develop a Performance Measure
Engineering Solutions

- “All Red” Intervals
- Strobe lights in the red lens
- Rumble strips on the approach lanes
- Frequent reevaluation of signal timing plans
- Dynamic Advance Warning Signs
- Corridor-wide Signal Synchronization
- Use of “Max Out” Capability
- Alternate Routes to Reduce Demand
- And more…. 
SUMMARY of the PROCESS

1. Install RLR monitoring equipment.
2. Identify root causes
3. Implement countermeasures
4. Monitor performance after changes
5. **Selective** enforcement with media Campaign
6. Implement automated enforcement (a last resort)
Potential Research Scope Items

- Deploy at different intersection scenarios
- Create Implementation Guide & refine process
- Develop Countermeasures “Toolbox”
- Correlate violation rates to crash rates
- Identify the “normal” violation rate spectrum
- Pursue private sector interest in partnering
- Developing user-friendly in-vehicle equipment
The “Nuts & Bolts”...
Red Light Running Monitoring System
Logic Diagram
(Autoscope 2004)

Controller
Phase Color Outputs

“AND” Logic

NB Detector

STOP BAR

1.2 second stretch applied

Counting Bin for NB

North
Red Light Running Monitoring System
Logic Diagram
(Solo Pro II)
Red Light Running Monitoring System Block Diagram

Image Sensor (Includes processor & data storage)

Twisted Pair Cable
3c-Power
2p-Comm.
1pr- Data
1pr- Video

Traffic Signal Pole

Junction Box

Traffic Signal Controller Cabinet

Traffic Signal Controller

Phase Color Input from controller to TS-1 or TS-2

TS-2 SDLC
TS-1

Mini Hub

RS 485
RS-232 (Computer Comm.)
RS-432 (Network Comm.)
Analog Video Output

AC
Grand Rapids, Michigan Site Map
Lafayette at Fulton in G.R., MI
Lafayette at Leonard in G.R., MI
Sample Detector Display
Sample Data

Northbound Thru RLR Violations

# of Violations

Time of Day
### Worst Hours for Red Light Running Last 3 Weeks

**At the corner of Main and Jefferson Street**

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Lessons Learned

- Use 2 Image Sensors per intersection
- Junction box on pole simplifies cable routing
- Fabricate a “Y” cable for controller connection
- Strap a flasher cabinet to the side of the cabinet
- Hourly counts are recommended over 15 min.