SafeStreet

Mobile Automatic Enforcement Systems

Roadside Cameras

Program Management

Complete Turnkey Solution

Full Citation Processing
Automatic Speed Enforcement Systems

* Portable Cameras
* Complete Turnkey Solution
* Program Management
* Full Citation Processing
Roadway Work Zone Safety

DOT Worker Struck And Killed
Mobile Automated Program
Objectives

*Increase Safety!*

- Increase worker safety
- Modify driver behavior
- Promote safer driving, in general
Traditional Enforcement Ineffective

- Manpower intensive
- Inconsistent enforcement
- ATE studies
Roadway Work Zone Statistics

- October 6, 2003 ... Highway Traffic Safety Administration.

- Texas led the nation in roadway construction deaths last year with 192, followed by California with 119.

- Nationwide, the report said 1,181 people were killed during 2002 in roadway construction zone accidents.
Quixote Corporation's Focus is in Three Areas of Roadway Safety...

Protect

Direct

Inform
The Hi-Dro Cushion bumper was the first product marketed by Energy.

This is a water bumper
Water Bumpers became...
Gas was too Expensive

People wanted smaller, lighter vehicles, not heavier vehicles.
City Testing Water-Filled Highway Buffers

Clustered Cylinders Set Up in Queens Cushion Impact

By EDWARD HUDSON

The city's Highway Department has begun to test water-filled "buffers" on heavily traveled roadways in an effort to reduce accident injuries.

The buffers, or bumpers, are clusters of plastic cylinders. They have been installed in front of concrete roadway dividers on two main Queens arteries.

When struck by a vehicle, the buffers cushion the blow by releasing a spray of water from the tops of the cylinders. There are about 50 cylinders to one buffer. Each cylinder is about three feet tall and six inches thick.

The installations were made last week.

One buffer was installed in front of a barrier dividing the east and westbound exits to Northern Boulevard from the northbound roadway of the Van Wyck Expressway in Flushing.

Water-filled cylinders form buffer at exit from Van Wyck Expressway to Northern Boulevard in Flushing. When struck by a vehicle, devices cushion the blow by releasing water.

The second was made on northern Boulevard on outbound traffic to the Whitestone Expressway and the Bronx-Whitestone Bridge on southbound traffic to the Van Wyck Expressway and Kennedy International Airport.

More Buffers Due

"Motorists who change lanes on the boulevard at the last minute, and too late to avoid striking the arrier divider, will be honored with water instead of broken glass and pieces of metal," Constantine Sidamon-Eristoff, Transportation Administrator, said in announcing the test.

Mr. Sidamon-Eristoff said that similar buffers would be placed on the West Side Highway and the Franklin D. Roosevelt Drive as part of the six-month experiment.

The test is the city's first evaluation of the safety devices. However, similar safety bumpers have also been installed in several key locations by the Port of New York Authority, according to a spokesman for the bistate agency. These include the George Washington Bridge and the Lincoln Tunnel.

The buffers have been also used in other cities and have produced "good advance reports" on their effectiveness, the Transportation Administrator said.

The cylinders are filled with a mixture of water and calcium chloride to prevent freezing in cold weather. The buffers operate on the same basic principle as the water-filled bumpers that are carried by some taxicabs in the city to reduce damage to cabs and injuries to occupants.
And thus, the crash cushion was born!
Research and testing facility is in Rocklin, California (near Sacramento)

This includes E-Tech, the testing arm of Energy
RubberTough
Inform
TRAFFIC INFO
TUNE TO
530 AM
URGENT MESSAGE
WHEN FLASHING
REDUCED SPEED AHEAD
TOO MUCH "INFORM"!
## Caltrans Worker Fatalities:

<table>
<thead>
<tr>
<th>Year</th>
<th>Errant Drivers</th>
<th>Other Accidents</th>
<th>Total Fatalities</th>
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<tbody>
<tr>
<td>1972-81</td>
<td>22</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>1982*-91</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>1992</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1993</td>
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<td>2000**</td>
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<tr>
<td>2001</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>40</strong></td>
<td><strong>37</strong></td>
<td><strong>77</strong></td>
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</tbody>
</table>

**Total:** 161
Now we get serious!
Prevention Recommendations

The CA/FACE investigator determined that, in order to prevent future occurrences, employers should develop procedures with the State’s Department of Transportation that will:

Reduce the speed limit in construction work zones.

Require the availability of traffic trucks with impact attenuators.

Ensure artificial lighting is used to improve visibility for night construction work zones.

Ensure Highway Patrol presence when putting down and picking up traffic cones.
# Automated Enforcement Technologies

## Violation Detection

**In Ground**
- Loops

**Above Ground**
- Video
- Radar

## Evidence Capture

- Low Resolution
  - Wet film camera

- High Resolution
  - Digital camera

## Evidence Retrieval

- Digital
  - High speed phone
  - Wireless
  - Internet

- Manually
Typical RLC: Loop Detectors

Traffic Signal

Loop Detectors

Red Light Camera & Flash

Electronic connection between RLC loops & traffic signal
System Components

- Commercial Non Proprietary Equipment
- Covers up to Four Lanes on Approach
- Takes Fore Pictures per Violation
- Rapid Fire (300 milliseconds between pictures)

- Speed Thresholds From 5 to 155 MPH
- Accurate Sensing in all weather conditions
- Up to 4 lanes
- Approved by FCC

- Adjustable output (18 - 600 Joule (Ws))
- Fast Recycle (250 millisecond)
- Approved for frontal photography
Portable Photo Speed Unit
Mobil Automated Enforcement

HOW IT WORKS*

The PEEK Traffic Mobile Automated Enforcement System operates from the side of the road, tracking traffic for speed and distance. The detection of the target starts at 300 meters for a single lane and 100 meters for multi-lane enforcement. When a vehicle exceeds the speed limit, the system triggers the alarms at the report line A. If the driver ignores the warning and the vehicle continues to exceed the speed limit at report line B, a photograph of the violation is taken and stored with the time, date, speed and location information embedded in the image. A warning or citation can be mailed to the registered vehicle owner.

*The example shows two report lines, but the system makes it possible to use up to eight different report lines.
Tracking Radar
Tracking Radar
The Three E Approach

- Engineering
- Enforcement
- Education
Automated Traffic Enforcement Just One Player in the Team for Success

Only through the coordinated effort of multiple individuals, groups, and agencies is this possible.
May we answer your questions?
Incident Capture

Current to Red Light
+ Programmed Delay
+ Speed Threshold
Triggers Camera
Red Light Running (RLR)

• 40% of all crashes occur at intersections

• 218,000 RLR intersection crashes annually
  – 880 result in fatalities
  – 181,000 injuries

• 19% increase in intersection fatalities from 1992-2000

• 91% of Americans feel RLR is dangerous

• Estimated Cost = $14 billion a year
To create today's

SAVING LIVES BY DESIGN

Quixote Corporation
US TRAFFIC CORPORATION

...and the speed radar sign market segment
Quixote Corporation today is the world’s leading supplier of transportation safety products.
Violation Detected

- Rear Photo Report Line “B”
- Captures Rear License Plate
- Shows Vehicle in Intersection
- Video Camera Captures Context View
Tag Shot Taken From Image
1.2 Megapixel
5.0 Megapixel
Typical RLC: Loop Detectors
Typical RLC: Loop Detectors

Traffic Signal

Loop Detectors

Electronic connection between RLC loops & traffic signal
Sensor Operation

Basic Setup:
- Report Lines
- Trigger Speed
- Minimum Red Time

Operation:
- Sensor tracks vehicle
- Sensor generates capture sequence-
  * Signal in Red phase
  * Vehicle exceeds Trigger Speed
The Data Bar provides information about the incident

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Site</th>
<th>Speed</th>
<th>Red. T</th>
<th>Pict.</th>
<th>Elap. T</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-28-2003</td>
<td>17:31:56</td>
<td>CLT01</td>
<td>34</td>
<td>1.8</td>
<td>29A</td>
<td>-</td>
</tr>
</tbody>
</table>
Incident Processing

Citation Issued

City of Charlotte RED LIGHT CAMERA PROGRAM
222 South Blvd. Suite 102 Charlotte, NC 28202

MAIL DATE: 04/16/2004
NOTICE OF CITATION
Citation Number: 3359709

Citation Number: 3359709
Plate: 4C2G7823C

On 04/07/2004 at 11:37AM, your vehicle was photographed crossing a red light at the intersection ofComments about the intersection in which the traffic signal was red, in violation of Charlotte City Code Section 14-152B. The civil penalty for this violation is $100.00. No points will be assessed against your driving record or insurance as a result of this violation. Please see reverse side for payment options and for a description of the information on the Data Block shown above the photographs.

This program has been initiated to increase roadway safety, reduce red light violations and prevent injuries. If you have any questions regarding this program, please visit our Internet site at www.charlotte.gov/redlight. Important Notice: Failure to pay the civil fine by the due date shown above will result in an additional late penalty of $10.00. Request for appeal and transfer of responsibility must also be received by the due date shown above or your request for appeal will be denied. For your convenience, you may pay or appeal your citation via the internet at www.charlotte.gov/redlight. Please be sure to use the internet password provided above to access your citation.

Red Light Camera
222 South Blvd.
Suite 102
Charlotte, NC 28202

Questions & Answers Regarding This Notice

1. Why did I receive this notice of citation?
   A. You were photographed running a red light by a traffic control photographic system.

2. Is this notice a misspelling violation notice?
   A. No, this notice is not considered to be a traffic infraction. It is a non-criminal violation for which civil penalties are assessed. No points will be assessed against this violation and it will not affect your insurance.

3. What are my options?
   A. You have the following four options:
   (1) You may accept responsibility, and pay the civil penalty (see Payment Options);
   (2) You may contest the citation by paying a $25.00 bond and requesting an administrative hearing (see Appeal Request);
   (3) If you are not driving the vehicle at the time of the violation, you may submit a notarized affidavit stating that you were not involved and verifying the individual who was driving was not driving. You may also request a new citation will be issued to the individual that you identify (see Transferring Responsibility);
   (4) If you were driving the vehicle at the time of the violation, you may submit a notarized affidavit stating that you were driving and verifying the individual who was driving was not driving. You may also request a new citation will be issued to the individual that you identify (see Transferring Responsibility).

Payment Options
Checks or money orders should be made payable to the City of Charlotte. Do not send cash. If you fail to reply within 30 days of the date of the citation, a penalty $60.00 will be added to the total amount due. To make sure you receive a notice of citation, address, license number and citation number are recorded on your check or money order.

Mail check or money order to:
City of Charlotte
222 South Blvd.
Charlotte, NC 28202

Appeal Request
An appeal request must be accompanied by a deposit of $50.00 which shall constitute a bond. You will be contacted to schedule a hearing before a hearing officer. If the hearing officer upholds the citation and your bond will be used to satisfy your penalty obligation. If the citation is dismissed, your bond will be returned.

Transmission of Violation
(for print or type name), being duly sworn, state that the vehicle identified in this Notice of Citation was, at the time of the violation. You may attach a separate document if the space provided is not sufficient.

Affiant Transferring Responsibility
(print or type name), being duly sworn, state that the vehicle identified in this Notice of Citation was, at the time of the violation. You may attach a separate document if the space provided is not sufficient.

Affiant Reporting Vehicle Stolen
(print or type name), being duly sworn, state that the vehicle identified in this Notice of Citation was, at the time of the violation. You may attach a separate document if the space provided is not sufficient.

For additional information, please call 704-739-3177.
• Charlotte, North Carolina red light camera program cut violations by more than 70 percent in the first year, and crashes dropped by more than 10 percent citywide, demonstrating that these systems have a positive community-wide impact.- National stop on red
• Dayton, OH- has reported a reduction in red light running city wide in excess of 28% and collisions in excess of 60% at enforced intersections.
• Savannah, GA – reported a reduction of red light running by 45% with their ATE program.
• Toledo, OH- reported a reduction of 26% drop in accidents at monitored intersections.
• Around the world red light camera technology has been used for more than 35 years. Currently installed in 45 countries throughout Europe, Australia, Hong Kong, Malaysia, Singapore, UK, South Africa. The first cameras in US installed in New York City 1993. Between 1981 and 1985 a half million RLR citations were issued using traditional methods. Since program began 1.4 million citations issued fewer than 7000 found not guilty.
Sensys Radar Sensor
Exclusivity Agreement with Peek Traffic
USA and Canada

- RS-240 Intelligent Microwave Sensor (Dual Doppler, 24.1 GHz Tracking Radar)
  - Two Report Lines for Speed Thresholds, behind stop bar and in intersection
  - Tracks up to 8 separate targets simultaneously
    - Verifies target motion, not simply Doppler shift
  - Adjustable from 30 to 245 Feet from Sensor
  - Thresholds From 5 to 155 MPH
  - 0.6 MPH Steps
  - Accurate All Weather Performance
  - Accurate Speed Sensing to within 1 MPH
  - Speed Enforcement Option
    - 13 degree beam width
  - Approved by FCC
Cabinet Built to Withstand Adverse Weather & Vandalism

- System Proven in Extreme Weather
  - Hot Desert to Near Arctic Latitudes
- Stainless Steel Outside Walls
  - (1.5 mm, SS2333, Gray Powder Coat)
- Three Point Security Lock on Door
- Non-Reflective Tempered Security Glass
Equipment Installation

• Camera, Control & Communications Subsystems
  – Housed in a Single Slim-Line, Pole Mounted Cabinet
  – Current transformer sensing of red light signal

• Detector Subsystem
  – RS-240 Intelligent Microwave Sensor
  – Pole or Mast-Arm Mounted (rear or front sensor)

• Flash
  – Adjustable Power
  – Mounted Off-Axis
Image Capture / Handling

Violation Detected

- Rear Photo Report Line “A”
- Captures Rear License Plate
- Documents vehicle Prior to Stop Bar
Incident Processing
Creation of Tag Close-Up

Date: 04-07-2004  Time: 11:38:39  Site: CLT02  Speed: 32  Red.1: 7.9  Pict.: 39A  Elap.: -
Incidnet Processing
Screen 2: First Level Processing

SafeLight
Charlotte

RED LIGHT VIOLATION

Violation Processing

Initial View
Click on the image to magnify

License Close Up
Click on the image to magnify

Final View
Click on the image to magnify

Create Closeup

Reject this violation
Enter the rejection reason:

Return Case to Queue

Reject

Add Note

Case #: DSC0299
Date/Time of Violation: Apr 07, 2004 11:30:29 AM
Red Light Duration: 7.99

Violation: Red Light
Location: 51st & Brevard

Request Vehicle Information
License Plate State: NC
License #: ET8678

Retrieve DMV Info
Intersection Cabinet
Violation Detected:

- Front Photo Report Line “A”
- Date, Time, Speed, etc.
- Images & Text Data (Evidence)
- Evidence securely transmitted to Central Office In-station (Hourly)
- Captures Driver Image
- Shows Vehicle Prior to Stop Bar
Violation Detected

- Front Photo Report Line “B”
- Captures Driver Image
- Shows Vehicle in Intersection
Typical System Placement

SKETCH IS NOT TO SCALE