

**CITY OF BROOKSVILLE
COUNCIL WORKSHOP
COUNCIL CHAMBERS
201 Howell Avenue
Brooksville, FL 34601**

AGENDA

October 22, 2014

7:00 P.M.

A. CALL TO ORDER

B. TRAFFIC LIGHT ENFORCEMENT SAFETY & STATISTICS

Presentation:	Police Chief and City Attorney
Action:	Review & Direction to staff
Attachments:	City Manager's Memo dated October 16, 2014 with attachments.

C. ADJOURN WORKSHOP

In accordance with the Americans with Disabilities Act, persons with disabilities needing a special accommodation to participate in this proceeding should contact the City Clerk's office 48 hours in advance of the meeting at (352) 540-3853. Meeting agendas and supporting documentation are available from the City Clerk's office and on line at www.cityofbrooksville.us.



AGENDA ITEM MEMORANDUM

TO: HONORABLE MAYOR AND CITY COUNCILMEN
FROM: T. JENNENE NORMAN-VACHA, CITY MANAGER
SUBJECT: PHOTO ENFORCEMENT/RED LIGHT CAMERA DISCUSSIONS
DATE: OCTOBER 16, 2014

On September 15, 2014, during Regular Session, City Council requested information and materials to discuss the City's Traffic Light Safety Ordinance. Council specifically requested the following items:

- ✓ Statistical monthly breakdown of citations issued in the last year. (This is provided in Attachment 2 – through the memorandum issued by Chief George Turner.)
- ✓ Information regarding the accuracy of the equipment used for traffic infraction detection equipment that measures the speed of the vehicles. (This is provided in Attachment 3 – through the memorandum issued by Hogan Law Firm.)
- ✓ The speed level used/cited by other cities or counties in the State of Florida for right on red enforcement and issuance of citations. (This is provided in Attachment 3 – through the memorandum issued by Hogan Law Firm.)

Also for Council's information we have included the following:

- ✓ Statistical breakdown of appeals to City Traffic Infraction Hearings. (This is provided in Attachment 2 – through the memorandum issued by Chief George Turner.)
- ✓ Copy of Ordinance 758-A, Traffic Light Safety. (This is provided as Attachment 1.)
- ✓ Studies on Safe Vehicle Turn Speeds. (Excerpts from three (3) different studies are provided in Attachment 3 – through the memorandum issued by Hogan Law Firm.)
- ✓ Copy of the annotated Florida Statutes for the Mark Wandall Traffic Safety Program. (This is provided in Attachment 3 – through the memorandum issued by Hogan Law Firm.)

Staff will be prepared to discuss the information/material provided with Council. We will also be presenting video of actual camera citations, inclusive of straight-through and right on red violations.

Attachment 1

ORDINANCE NO. 758-A TRAFFIC LIGHT SAFETY

AN ORDINANCE OF THE CITY OF BROOKSVILLE, FLORIDA, AMENDING ORDINANCE 758 RELATING TO TRAFFIC LIGHT SAFETY; PROVIDING FOR LEGISLATIVE FINDINGS AND PURPOSE; ESTABLISHING DEFINITIONS; ESTABLISHING AN ENFORCEMENT PROGRAM WITHIN THE CITY; AUTHORIZING THE CITY TO PERMIT AND IMPLEMENT THE USE OF TRAFFIC CONTROL SIGNAL MONITORING SYSTEM FOR RED LIGHT INFRACTIONS; PROVIDING ENFORCEMENT PROCEDURES, INCLUDING NOTICE, APPEAL HEARINGS, PENALTIES, IMPOSITION OF ADMINISTRATIVE CHARGES AND COLLECTION; PROVIDING FOR EXCEPTIONS; PROVIDING FOR DIRECTIONS TO THE CITY CLERK; PROVIDING FOR REFERRAL OF APPEALS TO HEARING OFFICERS AND MATTERS RELATING THERETO; PROVIDING FOR CODIFICATION, CONFLICTS, SEVERABILITY AND AN EFFECTIVE DATE.

WHEREAS, the City of Brooksville is vested with home rule authority pursuant to Article VII, Section 2 of the Constitution of the State of Florida and Chapter 166, Florida Statutes, to enact ordinances;

WHEREAS, pursuant to Section 1.03 and Section 2.13 of the Charter of the City of Brooksville, the City has the power to enable it to conduct municipal functions and to adopt ordinances; and,

WHEREAS, the City of Brooksville is located in a high density traffic area and regularly experiences traffic incidents related to the failure of motorists to obey duly erected traffic control devices, exposing its citizens to the dangers of personal injury and property damage;

WHEREAS, the City is concerned with the violation of State statutes and local ordinances concerning traffic signals, including the running of red lights;

WHEREAS, apprehending violators of traffic signals through law enforcement observance, chase and citation is difficult, dangerous and expensive and requires the City to commit an extreme amount of personnel that would not be necessary with the use of automated traffic infraction detectors with image capture technologies (unmanned cameras);

WHEREAS, local governments in different parts of the State and Nation have demonstrated that the combination of traffic infraction detectors with traditional traffic law enforcement methods enhances vehicular and pedestrian safety;

WHEREAS, the use of traffic infraction detectors is an effective means of enforcing traffic signal control laws;

WHEREAS, the City desires to reduce the number of violations of traffic light signals within the City by installing and implementing traffic infraction detectors and corresponding enforcement procedures;

WHEREAS, this ordinance is authorized by the Mark Wandall Traffic Safety Act, as set forth in Section 316 Florida Statutes, which recognizes the rights of municipalities to utilize traffic infraction detectors to regulate municipal traffic; and,

WHEREAS, the City of Brooksville finds that implementation of the enforcement program set forth in this ordinance will promote, protect and improve the health, safety and welfare of its citizens, consistent with the authority of and limitations on the City pursuant to the Constitution of the State of Florida and the Florida Statutes.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BROOKSVILLE, FLORIDA:

Section 1. Legislative Findings and Purposes.

- (a) The foregoing recitals are hereby adopted as the legislative findings of the City Council of the city of Brooksville and incorporated into this Ordinance as if set forth in haec verba.
- (b) The purpose of this ordinance is to authorize the use of traffic infraction detectors to promote compliance with red light signal directives, and to adopt a civil enforcement system for red light signal violations, all in accord with general law.
- (c) This ordinance will supplement law enforcement personnel in the enforcement of red light signal violations and shall not prohibit law enforcement officers from issuing a citation for a red light signal violation in accordance with normal statutory traffic enforcement techniques.

Section 2. Definitions.

- (a) *Careful and Prudent Manner* shall mean having regard for width, grade, curves, corners, traffic, actual and potential hazards, and all other attendant circumstances so as not to endanger pedestrians, other motor vehicles, or the property of another, while progressing at a rate of speed that does not exceed five (5) mph.
- (b) *Intersection* means the area embraced within the prolongation or connection of the lateral curb line; or if none, then the lateral boundary lines, of the roadways of two roads which join or intersect one another at, or approximately at, right angles; or the area within which vehicles traveling upon different roads joining at any other angle may come in conflict.
- (c) *Motor vehicle* means the meaning set forth in the definition in Fla. Stat. §316.003(21) or its successor provision.
- (d) *Notice of Violation* means a notice issued for a Red Zone Infraction.
- (e) *Owner* means the person or entity identified by the Florida Department of Highway Safety and Motor Vehicles, or other state vehicle registration office, as the registered

owner of a vehicle. Such term shall also mean a lessee of a motor vehicle pursuant to a lease of six months or more.

- (f) *Recorded images* means images recorded by a traffic infraction detector including but not limited to photographic images, electronic images, or streaming video images.
- (g) *Red zone infraction* means a traffic offense whereby a traffic infraction detector established that a motor vehicle entered an intersection controlled by a duly erected traffic control signal at a time when the traffic control signal for such motor vehicle's direction of travel was emitting a steady red signal.
- (h) *Traffic control signal* means a device exhibiting different colored lights or colored lighted arrows, successively, one at a time, or in combination, using only the colors green, yellow, and red which indicate and apply to drivers of motor vehicles as provided in F.S. § 316.075.
- (i) *Traffic infraction detector* means a vehicle sensor installed to work in conjunction with a traffic control signal and a camera or cameras synchronized to automatically record two or more sequenced photographic or electronic images or streaming video of only the rear of a motor vehicle at the time the vehicle fails to stop behind the stop bar or clearly marked stop line when facing a traffic control signal steady red light.
- (j) *Traffic infraction enforcement officer* means the City Police Department employee designated, pursuant to Section 7 herein, to review recorded images and issue notices of violation based on those images.

Section 3. Adherence to Red Light Traffic Control Signals. A motor vehicle facing a traffic control signal's steady red light indication shall stop before entering the crosswalk on the near side of an intersection or, if none, then before entering the intersection and shall remain standing until a green indication is shown on the traffic control signal; provided, however, the driver of a motor vehicle facing a traffic control signal's steady red light may make a right-hand turn in a careful and prudent manner at an intersection where right-hand turns are permissible.

Section 4. Use of Traffic Infraction Detectors. The City shall utilize recorded images from traffic infraction detectors as a supplemental means of monitoring compliance with the laws related to traffic control signals and as an ancillary deterrent to traffic control and red zone infractions. This ordinance shall not supersede, infringe, curtail or impinge upon any state laws related to red light signal violations or conflict with such laws.

Section 5. Introductory Period. The City may establish by resolution a period of time defined as the Introductory Period. During the Introductory Period, red zone infractions captured on recorded images by a traffic infraction detector shall not be assessed a penalty. The owner of the motor vehicle shall receive a courtesy notice of the violation. Infractions of traffic control signals including red zone infractions may be enforced at any time in accordance with normal traffic enforcement techniques and citations from a law enforcement officer.

Section 6. Penalties for Failure to Adhere to Red Light Traffic Control Signals. A violation of Section 3 of this ordinance (adherence to red light traffic control signals) established by a traffic infraction detector (red zone infraction) shall be enforced and assessed a penalty as set forth in Fla. Stat. §316.003, as may be amended from time to time.

Section 7. Enforcement of Adherence to Red Light Control Signals Using Traffic Infraction Detectors. Commencing on the effective date of this ordinance:

- (a) The chief of police or one or more designees shall serve as a traffic infraction enforcement officer. The traffic infraction enforcement officers shall be responsible for the accuracy and the integrity of the recorded images and the proper functioning of the traffic infraction detectors at the time recorded images are captured.
- (b) Recorded images will be taken of motor vehicles who commit a red zone infraction.
- (c) The City's traffic infraction enforcement officer shall review the recorded images to determine if (i) there exists reasonable and probable grounds to believe that a red zone infraction has been committed; (ii) the license tag number on the motor vehicle is visible in the recorded images and (iii) after taking into account all relevant facts, a Notice of Violation should be issued.
- (d) If the traffic infraction enforcement officer is satisfied that the above criteria has been met, a Notice of Violation shall be sent, via first class mail no later than thirty (30) days after the red zone infraction occurs, to the owner of the motor vehicle at the address on record with the Florida Department of Highway Safety and Motor Vehicles or any other state vehicle registration office. The recorded image shall be sufficient grounds to issue a Notice of Violation.
- (e) If an owner of a motor vehicle receives a Notice of Violation and fails to pay the penalty imposed by Fla. Stat. §316.0083, or to provide an affidavit that complies with this ordinance and the provisions of Fla. Stat. §316.0083 within thirty (30) days of the date the Notice of Violation is issued, then a Uniform Traffic Citation shall be issued to the owner of the motor vehicle. The Uniform Traffic Citation shall be issued no later than sixty (60) days after the red zone infraction occurs.

Section 8. Notice of Violation. Notices of Violations shall include at a minimum:

- (a) The name and address of the owner of the motor vehicle;
- (b) The license plate number and registration number of the motor vehicle;
- (c) The make, model, and year of the motor vehicle;
- (d) The statute violated;
- (e) The location of the intersection where the violation occurred;
- (f) The date and time of the red zone infraction;
- (g) Notice that the recorded images relating to the motor vehicle are evidence of a red zone infraction;
- (h) A signed statement by the traffic infraction enforcement officer that, based on inspection of recorded images, the motor vehicle was involved in a red zone infraction;

- (i) A statement that the owner of the motor vehicle has the right to review, either in person or remotely, the recorded images and that the recorded images constitute a rebuttal presumption against the owner of the motor vehicle;
- (j) A statement of the time and place or internet location where the evidence may be observed;
- (k) Images depicting the violation;
- (l) A statement that the owner must pay a penalty to the City, or provide an affidavit that complies with this ordinance and Fla. Stat. §316.0083 within thirty (30) days of the date the Notice of Violation is issued in order to avoid court fees, costs and the issuance of Uniform Traffic Citation;
- (m) Instructions on all methods of payment of the penalty; and,
- (n) A statement specifying the remedies available under Fla. Stat. §318.14.

Section 9. Affidavit of Non-responsibility.

- (a) Penalties for violations of this ordinance will be assessed against the motor vehicle owner unless the motor vehicle owner establishes that:
 1. The motor vehicle passed through the intersection in order to yield right-of-way to an emergency vehicle or funeral procession;
 2. The motor vehicle passed through the intersection at the direction of a law enforcement officer;
 3. The motor vehicle was, at the time of the violation, in the care, custody and control of another person; or
 4. A uniform traffic citation was issued by a law enforcement officer to the driver of the vehicle for the same violation.
- (b) If the motor vehicle was in the care, custody and control of another person, the affidavit must include the name, address, date of birth, and, if known, the driver's license number of the person who leased, rented or otherwise had care, custody or control of the motor vehicle at the time of the violation.
- (c) If the vehicle was stolen at the time of the violation, the affidavit must include the police report indicating that the vehicle was stolen.
- (d) If a Uniform Traffic Citation was issued by a law enforcement officer for the violation, then the affidavit must include the serial number of the Uniform Traffic Citation issued.
- (e) The affidavit must be executed in the presence of a notary, and include the following language immediately above the signature line: "Under penalties of perjury, I declare that I have read the foregoing affidavit and that the facts stated in it are true. I understand that submission of a false affidavit is a misdemeanor of the second degree and punishable as provided in Fla. Stat. §775.082 or §775.083."

Section 10. Signage. When the City installs a traffic infraction detector at an intersection, it shall erect signage at the intersection sufficient to notify the public that a traffic infraction detector may be in use at the intersection and the signage shall include specific notification of traffic infraction detector enforcement of right hand turns. Signage shall meet the specifications for uniform signals and devices adopted by the Department of Transportation pursuant to Fla. Stat. §316.0745.

Section 11. Authority of City Manager to Promulgate Rules and Procedures to Implement this Ordinance. The City Manager is authorized to implement the provisions and requirements of the Mark Wandall Traffic Safety Act within the jurisdiction of the City in coordination with the Chief of Police or other designee. The City Manager shall have authority to promulgate policies and procedures to implement this ordinance and the Mark Wandall Traffic Safety Act, including installing and implementing traffic infraction detectors and promulgating the form of the Notice of Violation and the Affidavit of Non Responsibility.

Section 12. Admissibility of Recorded Images in Enforcement Proceedings. The recorded images attached to or referenced in a Notice of Violation or Uniform Traffic Citation are evidence that a red zone infraction has occurred, are admissible as evidence in any proceeding to enforce this ordinance, and raise a rebuttable presumption that the motor vehicle identified in the recorded images and named on the Notice of Violation was used in violation of Section 3.

Section 13. Severability. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

Section 14. Amendment to Code. This Ordinance shall be and become a part of the Code of the City of Brooksville, Florida, to amend and restate in its entirety Chapter 74 – Streets, Sidewalks, and other Public Places, Article V – Traffic Light Safety, Section 74-201 through Section 74-214.

Section 15. Conflicts and Repealer. This Ordinance shall be cumulative of all provisions of the ordinances of the City of Brooksville, Florida, except where provisions of this Ordinance are in direct conflict with the provisions of such ordinance, which event all ordinances or parts thereof in conflict with this Ordinance are hereby repealed to the extent of such conflict.

Section 16. Codification. The provisions of this Ordinance, including its recitals, shall become and be made a part of the *Code of Ordinances of the City of Brooksville, Florida* and the Sections of this Ordinance may be renumbered or re-lettered to accomplish such intention and the word “Ordinance”, or similar words, may be changed to “Section,” “Article”, or other appropriate word; provided, however, that Sections 13, 14, 15, 16, and 17 shall not be codified. The Code codifier is granted liberal authority to codify the provisions of this Ordinance.

Section 17. Effective Date. This Ordinance shall take effect the 1st day of July, 2010.

CITY OF BROOKSVILLE, FLORIDA

Attest:

Janice Peters, City Clerk

By: s/Lara Bradburn

Lara Bradburn, Mayor/Chair

PASSED on First Reading June 7, 2010

NOTICE Published on June 11, 2010

PASSED on Second & Final Reading June 21, 2010

Approved as to form for the reliance of the City
of Brooksville only:

VOTE OF COUNCIL:

Bernardini AYE

Bradburn AYE

Burnett AYE

Johnston ABSENT

Lewis AYE

s/Jennifer C. Rey, for

Thomas S. Hogan, The Hogan Law Firm, LLC,
City Attorney

Attachment 2



MEMORANDUM

TO: HONORABLE MAYOR AND CITY COUNCILMEN
VIA: T. JENNENE NORMAN-VACHA, CITY MANAGER *(Signature)*
FROM: GEORGE B. TURNER, POLICE CHIEF *(Signature)*
SUBJECT: PHOTO ENFORCEMENT/RED LIGHT CAMERA CITATIONS
DATE: OCTOBER 14, 2014

This memorandum is provided in preparation of the City Council Workshop regarding the City's Photo Enforcement/Red Light Camera program.

The following is a recap of the monthly citations issued through the Photo Enforcement/Red Light Camera program for the last year:

September 2014:	767
August 2014:	661
July 2014:	2,139
June 2014:	2,574
May 2014:	1,968
April 2014:	1,519
March 2014:	1,186
February 2014:	885
January 2014:	1,238
December 2013:	1,038
November 2013:	1,245
October 2013:	1,596

The following is a recap of the number of appeals to the City Traffic Infraction Hearings for the last year:

September 2014:	24
August 2014:	38
July 2014:	31
June 2014:	15
May 2014:	29
April 2014:	26
March 2014:	33
February 2014:	26
January 2014:	21
December 2013:	21
November 2013:	19

Attachment 3

MEMORANDUM

TO: CITY OF BROOKSVILLE COUNCIL MEMBERS AND CITY MANAGER

**FROM: CLIFF TAYLOR AS ASSISTANT CITY ATTORNEY AND LIZ LESTER AS LAW CLERK
FOR THE ASSISTANT CITY ATTORNEY**

SUBJECT: RLC WORKSHOP

DATE: OCTOBER 14, 2014

FACTUAL BACKGROUND:

The City of Brooksville, Florida is considering changes to its Red Light Camera Program in a Workshop on October 22nd, 2014. The Council has asked the City Attorney to compile information concerning the reliability of Sensys' traffic infraction detection equipment, the right on red enforcement of other Florida cities and counties that have red light camera programs, and studies which discuss safe speeds at which vehicles may make a turn that should be useful in the Council's discussion

INFORMATION ATTACHED:

The attached are documents meant to be useful in assisting the council in its Workshop discussion on October 22nd.

a. Sensys Equipment Documents

Concerning the reliability of Sensy America's traffic infraction detection equipment, the City Attorney has provided FDOT certification documents. FDOT, in these certification documents, approved the equipment of Sensys for use on Florida roads. The documents indicate that the rate of error for the traffic infraction detection equipment in terms of measuring speed was 1mph. Sensys America has 13 homologations in Europe (a type of certification) including in some countries where traffic infractions are a criminal offense and, consequently, the standard of proof is raised.

b. Right on Red Enforcement Around Florida

Concerning right on red enforcement in Florida cities and counties, the City Attorney has collected information from over 40 cities and counties in Florida which now have or have recently had red light programs in place. This information has been placed in a table for the Council's convenience. The table lists the city or county and each city or county's corresponding right on red enforcement protocol (whether speed is used, what its speed is, etc.).

c. Studies on Safe Vehicle Turn Speeds

Lastly, the City Attorney has included excerpts from three studies that focus on safe turning speeds for vehicles. The first study, titled "Florida Intersection Design Guide 2014", discusses at what speeds it is safe for a vehicle to turn. The second study, titled "Comprehensive Study to Reduce Pedestrian Crashes in Florida" focuses on the impact of intersection speeds and rules on pedestrian safety. The third study, titled "Pedestrian Fatality Risk As a Function of Car Impact Speed" is a study which details the effect of speed on the survival rates of pedestrians who have been struck by a vehicle.

CONCLUSION:

In summary, this packet provides the Council with information regarding Sensys' traffic infraction detection equipment, right on red enforcement information for other Florida cities and counties, and studies concerning safe turn speeds for vehicles.



Traffic Infraction Detector Equipment and Testing Specifications

December 16, 2010

1.0 General

1.1 Purpose

The "Mark Wandall Traffic Safety Act" was signed into law with an effective date of July 1, 2010. The law authorizes the use of Traffic Infraction Detectors, commonly known as red light running cameras, on state, county, and municipal roads, streets, and highways in the State of Florida.

Section 316.07456, Florida Statutes, was created and requires that any Traffic Infraction Detector (TID) in Florida meet equipment and testing specifications developed by the Florida Department of Transportation (FDOT). The specifications described below establish such requirements as the minimum acceptable standard.

1.2 Scope

The scope of these specifications is limited to the operational and technical requirements of TID field equipment and technology used for red light running enforcement. Installation and placement specifications are described in the separate FDOT document, *Traffic Infraction Detector Installation and Placement Specifications*.

1.3 Definitions

1.3.1 Compliant Vehicle

A motor vehicle that stops behind the stop bar or clearly marked stop line when facing a traffic control signal steady red indication or traveling over the stop bar or clearly marked stop line when facing traffic control signal steady green or steady yellow indications.

1.3.2 Event

When a motor vehicle fails to stop behind the stop bar or clearly marked stop line when facing a traffic control signal steady red indication.

1.3.3 Traffic Signal Maintaining Agency

The County, City, or other authorized governmental agency in Florida that has operational and/or maintenance responsibility for the traffic control signal equipment at a given intersection. If the traffic control signal equipment is on a State Road, this is the agency that has an executed maintenance agreement with the Florida Department of Transportation.

1.3.4 Traffic Infraction Detector

Section 316.003(87), Florida Statutes defines a *Traffic Infraction Detector* (TID) as a vehicle sensor installed to work in conjunction with a traffic control signal and a camera or cameras synchronized to automatically record two or more sequenced photographic or electronic images or streaming video of only the rear of a motor vehicle at the time the vehicle fails to stop behind the stop bar or clearly marked stop line when facing a traffic control signal steady red light.

2.0 Event Scenarios

2.1 Event with Single Vehicle in Single Lane

The TID shall capture an Event with a single vehicle in a single through lane.

2.2 Event with Single Vehicle with Multiple Compliant Vehicles in Single Lane

The TID shall capture an Event with a single vehicle in a single through lane with the presence of multiple compliant vehicles in the same lane.

2.3 Event with Single Vehicle with Multiple Compliant Vehicles in Multiple Lanes

The TID shall capture an Event with a single vehicle in a single through lane with the presence of multiple compliant vehicles in the same and adjacent through lanes.

2.4 Event with Multiple Vehicles in Single Lane

The TID shall capture multiple Events with multiple vehicles in a single through lane.

2.5 Event with Multiple Vehicles in Multiple Lanes

The TID shall capture multiple Events with multiple vehicles in the same and adjacent through lanes.

2.6 Left Turn Lane Events

The TID shall meet the requirements of Sections 2.1 – 2.5 for left turn lane Events.

2.7 Right Turn on Red

The TID shall be capable of identifying Events where the speed of a single vehicle or multiple vehicles making a right turn on red is more than a configurable threshold speed. Speed shall be in miles per hour.

3.0 Event Information

3.1 Images and Video

The TID shall capture and store the following Event information:

1. Photographic or electronic image of the intersection that includes the rear of the vehicle and license tag at a time the vehicle is in advance of the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light visible in the image;
2. Photographic or electronic image of the intersection that includes the rear of the vehicle and license tag at a time the vehicle is beyond the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light visible in the image; and
3. If Right Turn on Red events are enforced, a minimum of 5 seconds of streaming video of the intersection that includes the rear of the vehicle and license tag beginning at a time the vehicle is in advance of the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light and ending at a time after the vehicle is beyond the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light.

At least one of the two photographic or electronic images of the license tag, including license tag state, number and specialty logo (if applicable), shall be clearly legible. The viewable images shall have a minimum pixel resolution of 640 by 480.

The video shall have a minimum pixel resolution of 320 by 200 with a minimum frame rate of 5 frames per second.

The TID shall include protective measures to prevent modification or unauthorized manipulation of captured and stored photographic or electronic images and video.

The TID shall not capture nor store any front photographic or electronic images or videos of vehicle occupants.

3.2 Alpha-numeric Data

The TID shall capture and store the following Event information in English text and/or Arabic numerals:

1. Names of intersecting Street and Highways;
2. A unique identifier of the intersection;
3. Lane number;
4. Direction of travel;
5. Month, day and year of the Event;
6. Hour, minute, and second of the photographic or electronic images in the local time; and
7. The difference in time from the beginning of the traffic control signal steady red light to the associated photographic or electronic images in tenths of a second.

The time of the photographic or electronic images or video shall be synchronized to an external source such that it is always within +/- one minute of Coordinated Universal Time (UTC).

The alpha-numeric data and corresponding photographic or electronic image(s) shall be automatically captured at the same time. The data shall be associated with the photographic or electronic image without human intervention.

4.0 TID Equipment

4.1 Electromagnetic Interference

The TID equipment shall not interfere with any traffic control signal or other FDOT or Traffic Signal Maintaining Agency equipment. TID equipment that requires regulation by the Federal Communications Commission (FCC) shall meet the requirements in the 2005 Code of Federal Regulation (CFR), Title 47, Part 15, and be FCC certified. The FCC identification number shall be externally displayed on the TID equipment.

4.2 Illumination

If visible illumination is used, the power of an illuminator (flash) device shall not exceed 350 watts/second. The illuminator device shall have the capability of being filtered and/or positioned to limit effects on the drivers' field of vision.

4.3 Vandalism

TID cabinets and camera housings shall have protective measures against vandalism.

5.0 Traffic Signal Equipment

If the Traffic Signal Maintaining Agency allows access to the traffic control signal cabinet, the TID shall not impact operations or maintenance of the traffic control signals, pedestrian signals, or any other traffic control devices.

5.1 Traffic Control Signal Cabinet

Any attachment to traffic control signal cabinet wiring shall be electrically isolated from the traffic control signal cabinet. Electrical sensing devices shall be "donut" current transformers or Hall-effect devices. All other physical or electrical connections to traffic signal control circuits shall not be allowed, including load switch driver control circuits, load switch signal circuits and detection circuits.

5.2 Surge Protection

All TID equipment shall be electrically isolated from traffic signal equipment. If the Traffic Signal Maintaining Agency allows access to the traffic control signal cabinet, a surge protective device(s)

shall be installed on any conductive bonds between the traffic control signal cabinet equipment and the TID equipment to protect the traffic signal equipment. If electric power is obtained from an FDOT or Traffic Signal Maintaining Agency power service, a surge protective device(s) shall be installed between the TID equipment or circuit breaker and the power service. All surge protective devices and grounding systems installed shall meet the current FDOT Standard Specifications for Road and Bridge Construction.

6.0 Testing

Testing shall be conducted in accordance with the manufacturer's recommendations or in accordance with the County or City testing requirements, whichever is more stringent. Testing shall be conducted at regular intervals in accordance with the manufacturer's recommendations or in accordance with the County or City testing requirements, whichever is more frequent.

At a minimum, testing shall include:

6.1 System Test Function

The TID shall activate and create Event information consistent with an Event, when artificially activated by a system test function.

6.2 Self Test Function

The TID shall perform and record the results of a daily internal self test sequence that confirms proper operation of each critical system component. If the system fails on one or more portions of the internal self test, the system will render itself inoperable until a successful internal self test is recorded.

7.0 Documentation

The TID manufacturer shall provide the following documentation:

- Installation and/or users manual(s) required to install and calibrate all TID equipment;
- Operations, maintenance and/or service manual(s) required to operate and maintain all TID equipment;
- Testing results in accordance with Section 6.0; and
- A certification statement signed by an authorized official of the manufacturer indicating that the manufacturer's TID conforms to these specifications.

Florida Traffic Infraction Detector Equipment and Testing Compliance Matrix

Date: 23-Oct-12

Authorized Official
Name (print): Carlos Loifstadt, President and CEO

Manufacturer: Sensys America, Inc

Item, Model No.: Red Light Safety System (RLSS)

Signature: 

ID No. Section	Requirement	Item comply? (Yes/No)	Comments
1 1.3.1	TID defines 'Compliant Vehicle' as a motor vehicle that stops behind the stop bar or clearly marked stop line when facing a traffic control signal steady red indication or traveling over the stop bar or clearly marked stop line when facing traffic control signal steady green or steady yellow indications.	Yes	The RLSS tracks the speed and position of each vehicle in the enforcement zone. Any vehicle that comes to a complete stop before the stop bar when facing a red signal or crosses the stop bar when facing a steady red or yellow indication is ignored by the RLSS.
2 1.3.2	TID defines 'Event' as when a motor vehicle fails to stop behind the stop bar or clearly marked stop line when facing a traffic control signal steady red indication.	Yes	The RLSS captures Events only when a vehicle crosses the stop bar facing a steady red control signal.
3 1.3.4	Section 316.003(87), Florida Statutes defines a TID as a vehicle sensor installed to work in conjunction with a traffic control signal and a camera or cameras synchronized to automatically record two or more sequenced photographic or electronic images or streaming video of only the rear of a motor vehicle at the time the vehicle fails to stop behind the stop bar or clearly marked stop line when facing a traffic control signal steady red light.	Yes	The RLSS senses the signal change using a direct, passive connection or through a wireless optical sensor and precisely times sequenced photographs and video to capture high resolution digital images of vehicle crossing the stop bar against a steady red signal.
4 2.1	TID captures an Event with a single vehicle in a single through lane.	Yes	The RLSS captures nearly every violation across all lanes of traffic and specifically identifies and photographs the violating vehicle.
5 2.2	TID captures an Event with a single vehicle in a single through lane with the presence of multiple compliant vehicles in the same lane.	Yes	The RLSS tracks multiple vehicles across several lanes of traffic and easily distinguishes between compliant and non-compliant vehicles.
6 2.3	TID captures an Event with a single vehicle in a single through lane with the presence of multiple compliant vehicles in the same and adjacent through lanes.	Yes	The RLSS tracks multiple vehicles across several lanes of traffic and easily distinguishes between compliant and non-compliant vehicles.
7 2.4	TID captures multiple Events with multiple vehicles in a single through lane.	Yes	The RLSS tracks multiple vehicles across several lanes of traffic and easily distinguishes between compliant and non-compliant vehicles.
8 2.5	TID captures multiple Events with multiple vehicles in the same and adjacent through lanes.	Yes	The RLSS tracks multiple vehicles across several lanes of traffic and easily distinguishes between compliant and non-compliant vehicles.
9 2.6	TID meets the requirements of Sections 2.1 - 2.5 for left turn lane Events.	Yes	The radar technology used by Sensys tracks vehicles in all lanes regardless of turning indications.
10 2.7	TID is capable of identifying Events where the speed of a single vehicle or multiple vehicles making a right turn on red is more than a configurable threshold speed. Speed is in miles per hour.	Yes	The RLSS measures the speed of approaching vehicles at plus or minus 1 MPH. The system is configurable to capture violations at any specified speed threshold.
11 3.1	TID captures and stores photographic or electronic image of the intersection that includes the rear of the vehicle and license tag at a time the vehicle is in advance of the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light visible in the image.	Yes	The first enforcement image captured and stored by the RLSS is a high resolution digital photograph of the subject vehicle with its front wheels clearly behind the stop bar with the red signal phase clearly in view.
12	TID captures and stores photographic or electronic image of the intersection that includes the rear of the vehicle and license tag at a time the vehicle is beyond the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light.	Yes	The second enforcement image captured and stored by the RLSS is a high resolution digital photograph of the subject vehicle with its front wheels clearly beyond the stop bar with the red signal phase clearly in view.
13	If Right turn on Red events are enforced, TID captures and stores a minimum of 5 seconds of streaming video of the intersection that includes the rear of the vehicle and license tag beginning at a time the vehicle is in advance of the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light and ending at a time after the vehicle is beyond the stop bar or clearly marked stop line with the corresponding traffic control signal steady red light.	Yes	The RLSS captures a minimum of 5 seconds of streaming video conforming to this item 13 for every captured violation including right turn violations where applicable.
14	At least one of the two photographic or electronic images of the license tag, including license tag state, number and specialty logo (if applicable), is clearly legible. The viewable images have a minimum pixel resolution of 640 by 480.	Yes	The RLSS extracts a clearly legible digital image of the subject vehicle's license tag from one of the two enforcement photographs. Image resolution equals or exceeds 640x480.
15	The video has a minimum pixel resolution of 320 by 200 with a minimum frame rate of 5 frames per second.	Yes	All RLSS videos meet or exceed the requirements of this item 15.
16	TID includes protective measures to prevent modification or unauthorized manipulation of captured and stored photographic or electronic images and video.	Yes	The RLSS uses advanced MD5 checksum image protection and all violation data is protected using AES technology.
17	TID does not capture nor store any front photographic or electronic images or videos of vehicle occupants.	Yes	The RLSS is not configured to capture the front of any violating vehicle or any passengers in such vehicle.

Authorized Official's Initials:  Date: Oct 23, 2012

ID No.	Section	Requirement	Item comply? (Yes/No)	Comments
18	3.2	TID captures and stores the following Event information in English text and/or Arabic numerals: 1. Names of intersecting Street and Highways; 2. A unique identifier of the intersection; 3. Lane number; 4. Direction of travel; 5. Month, day and year of the Event; 6. Hour, minute, and second of the photographic or electronic images in the local time; and 7. The difference in time from the beginning of the traffic control signal steady red light to the associated photographic or electronic images in tenths of a second.	Yes	Each RLSS is configured to capture and store in English text or Arabic numerals 1. Intersection name, 2. Unique intersection and approach identifier, 3. Lane number (determined by speed and position and visually confirmed), 4. Travel direction, 5. Month, day and year, 6 Exact time of each violation image, 7. violation time into red and amber time to the nearest tenth of a second. The RLSS establishes time using the Net Time Protocol
19		The time of the photographic or electronic images or video are synchronized to an external source such that it is always within plus or minus one minute of Coordinated Universal Time (UTC).	Yes	All infraction data is captured automatically at roadside by the RLSS. The data is immediately encrypted and transmitted securely to our processing center with no human intervention.
20		The alpha-numeric data and corresponding photographic or electronic image(s) are automatically captured at the same time. The data is associated with the photographic or electronic image without human intervention.	Yes	The RLSS system connects to traffic control signals, if at all, passively and has not impact whatsoever on traffic signal timing or operation. Each system meets FCC requirements and the FCC identification number is externally displayed.
21	4.1	The TID equipment does not interfere with any traffic control signal or other FDOT or Traffic Signal Maintaining Agency equipment. TID equipment that requires regulation by the Federal Communications Commission (FCC) meets the requirements in the 2005 Code of Federal Regulation (CFR), Title 47, Part 15, and is FCC certified. The FCC identification number is externally displayed on the TID equipment.	Yes	The RLSS variable wattage flash is typically set at 250W/second and does not exceed the threshold set forth in item 22.
22	4.2	If visible illumination is used, the power of an illuminator (flash) device does not exceed 350 watts/second.	Yes	The RLSS flash is filtered and pointed toward the road surface to minimize the impact on drivers. We also offer a near infrared flash which is nearly invisible to the human eye.
23	4.2	The illuminator device has the capability of being filtered and/or positioned to limit effects on the drivers' field of vision.	Yes	The RLSS are fully enclosed in bullet resistant, military spec hardened metal alloy. The enclosures are then double locked with eight anchor point hardened steel locks. An optional alarm system can also be provided that can send an alarm based on open door, vibration or tilting.
24	4.3	TID cabinets and camera housings have protective measures against vandalism.	Yes	The RLSS does not in any way interfere with any impact, modify, interfere with or otherwise hamper the operation, timing, maintenance, MTBF or any other aspect of traffic control signals, pedestrian signals or any other traffic control device.
25	5.0	If the Traffic Signal Maintaining Agency allows access to the traffic control signal cabinet, the TID does not impact operations or maintenance of the traffic control signals, pedestrian signals, or any other traffic control devices.	Yes	The RLSS connection to any traffic control signal cabinet is passive, isolated torroid ("donut") magnet. No other connection is required or used.
26	5.1	Any attachment to traffic control signal cabinet wiring is electrically isolated from the traffic control signal cabinet. Electrical sensing devices are "donut" current transformers or Hall-effect devices. No other physical or electrical connections to traffic signal control circuits are allowed, including load switch driver control circuits, load switch signal circuits and detection circuits.	Yes	The RLSS systems GFCI surge protection to protect all devices.
27	5.2	All TID equipment is electrically isolated from traffic signal equipment. If the Traffic Signal Maintaining Agency allows access to the traffic control signal cabinet, a surge protective device(s) is installed on any conductive bonds between the traffic control signal cabinet equipment and the TID equipment to protect the traffic signal equipment.	Yes	Any power obtained from FDOT or Traffic Signal Maintaining Agency power service, a surge protective device meeting FDOT Standard Specifications for Road and Bridge Construction will be installed between the RLSS or circuit breaker and the power service.
28		If electric power is obtained from an FDOT or Traffic Signal Maintaining Agency power service, a surge protective device(s) is installed between the TID equipment or circuit breaker and the power service. All surge protective devices and grounding systems installed meet the current FDOT Standard Specifications for Road and Bridge Construction.	Yes	Each RLSS self monitors every component and issues an automatic alert in the event that any component is operating outside of manufacturer's specifications. In addition, we do a regular physical inspection in accordance with manufacturer's recommendations (or more frequently if required by County or City testing requirements.)
29	6.0	Testing is conducted in accordance with the manufacturer's recommendations or in accordance with the County or City testing requirements, whichever is more stringent. Testing is conducted at regular intervals in accordance with the manufacturer's recommendations or in accordance with the County or City testing requirements, whichever is more frequent.	Yes	The RLSS performs continuous self-diagnostics and confirms radar calibration after every violation event detected.
30		Testing includes, at minimum, System Test Function and Self Test Function.	Yes	The RLSS performs a complete self-test including simulated violation upon start up or when activated in test mode, creating simulated event information.
31	6.1	The TID activates and creates Event information consistent with an Event, when artificially activated by a system test function.	Yes	Each RLSS self monitors every component and issues an automatic alert in the event that any component is operating outside of manufacturer's specifications. In addition, we do a regular physical inspection in accordance with manufacturer's recommendations (or more frequently if required by County or City testing requirements.)
32	6.2	The TID performs and records the results of a daily internal self test sequence that confirms proper operation of each critical system component.	Yes	If any self-test identifies a malfunction or other condition that would in any way render its operation unreliable, the RLSS will cease capturing events until it is repaired.
33	6.2	If the system fails on one or more portions of the internal self test, the system renders itself inoperable until a successful internal self test is recorded.	Yes	Each of the items specified in Item 34 is provided and maintained by the RLSS manufacture
34	7.0	The TID manufacturer provides: • Installation and/or users manual(s) required to install and calibrate all TID equipment; • Operations, maintenance and/or service manual(s) required to operate and maintain all TID equipment; • Testing results in accordance with Section 6.0 (ID numbers 30 through 33) of the Traffic Infraction Detector Equipment and Testing Specifications.	Yes	

Cities and Counties with Red Light Camera Programs

CITY/COUNTY	SPEED USED FOR CITATION ISSUANCE
Cocoa Beach	No Speed Used*
Palm Bay	15mph before program discontinued
Coral Springs	No ROR**
Fort Lauderdale	No ROR
Hollywood	Permitted Intersections/No Speed***
Pembroke Pines	No ROR according to online reports
Palm Coast	14mph according to online reports
Clewiston	14mph before program discontinued according to online reports
Hillsborough County	15mph according to online reports
Tampa	18mph according to online reports
Temple Terrace	15mph according to online reports
Clermont	10mph
Groveland	No Speed Used
Bradenton	15mph according to online reports
Manatee County	1mph according to online reports
Aventura	Complete stop required according to online reports
Coral Gables	No ROR according to online reports
Cutler Bay	No ROR according to online reports
Doral	No ROR according to online reports
Miami	No ROR according to online reports
Miami Springs	15mph according to online reports
North Miami	No ROR according to online reports
Surfside	No ROR
Ocoee	11mph according to online reports
Orlando	No ROR according to online reports
New Port Richey	15mph according to online reports
Clearwater	No ROR
Gulfport	12mph according to online reports
South Pasadena	12mph according to online reports
St. Petersburg	12mph before program discontinued
Haines City	No ROR
Lakeland	10mph
Sarasota	Permitted intersections only
Daytona Beach	No ROR
Kenneth City	12mph
Oldsmar	12mph

**"No Speed Used" indicates that the City does prosecute right on red violations but it does not use any speed in its analysis of what is "careful and prudent."

***"No ROR" indicates that the City has a red light program but it does not prosecute right on red violations. It only prosecutes straight through violations.

****"Permitted intersections only" indicates that the City only prosecutes those who turn right at intersections which have "No Right On Red" signs.



Florida Intersection Design Guide 2014

For New Construction and Major Reconstruction of
At-Grade Intersections on the State Highway System



Florida Department of Transportation
Roadway Design Office
Revised 6/27/2014

1 INTRODUCTION

The design of at-grade intersections requires strict conformance with standard practice, combined with the experience and creativity of the designer in selecting and applying the most appropriate treatment to accommodate each traffic movement. Uniformity is an important ingredient of intersection design because it is essential that all road users encounter familiar conditions at each intersection. Uniform standards and principles also serve to promote intersection treatments that have proven successful and have been accepted by transportation professionals and road users.

On the other hand, each intersection may have unique features that distinguish it in some way from other intersections. In addition, there are legitimate differences in local preferences that have created a set of equally acceptable alternatives for some treatments. This creates a tradeoff between uniformity and flexibility. Clearly, the most appropriate design policy is one that sets forth the standards and principles that must be observed and provides some latitude for choice in areas where choice can be offered.

The purpose of this document is to identify the mandatory requirements and to provide guidelines for choice where alternatives exist. The mandatory requirements are collected from several sources that are recognized by the Florida Department of Transportation (FDOT). The guidelines represent a combination of material from authoritative references and research reports combined with the consensus of a broad based team of transportation professionals.

1.1 INTERSECTION DESIGN REQUIREMENTS AND OBJECTIVES

The guidelines presented in this document are based on the premise that the design of an intersection must conform in all respects to the provisions of the *Florida Statutes* and rules, plus all authoritative references that have been adopted as standards by the FDOT.

In addition, the design should be such that it provides:

1. Safe and convenient operation for all road users, including cyclists and pedestrians;
2. Proper accessibility for pedestrians with special needs;
3. Adequate capacity for peak-hour demand on all movements;
4. Adequate maneuvering space for design vehicles;
5. Resolution of conflicts between competing movements;
6. Reasonable delineation of vehicle paths;
7. Adequate visibility of conflicting traffic;
8. Storage for normal queuing of vehicles;
9. Appropriate access management application;
10. Minimum delay and disutility to all road users;

and the criteria and procedures for assigning these classifications to specific roads. These classifications contain separation standards for access features. Essentially, the Department of Transportation determines which roads are the most critical to providing high speed, high volume traffic, and assign the highest standards these facilities.

Roundabouts are especially useful in access management strategies in that the available U-turn movements afford the opportunity for restrictive medians.

Designers should consult the Systems Planning Office's Access Management website for specific guidance regarding access management:

<http://www.dot.state.fl.us/planning/systems/>

3.3 DESIGN SPEEDS

Design speed is a principal design control that regulates the selection of many of the project standards and criteria used to design a roadway project. The mainline design speed will influence the design elements of the intersection such as selection of control mode, location and design of islands, taper lengths, and sight distance requirements.

Vehicles turning at intersections designed for minimum-radius turns have to operate at speeds of less than 10 mph. While it may be desirable and at times feasible to design for turning vehicles operating at higher speeds, it is often necessary for safety and economy to use lower turning speeds at most at-grade intersections. The speeds for which intersection curves should be designed depend on approaching vehicle speeds, design vehicle, type of intersection, control mode, pedestrian volume and through and turning volumes.

3.4 DESIGN VEHICLES

A design vehicle is a selected motor vehicle with the weight, dimensions and operating characteristics used to establish highway design controls for accommodating vehicles of a designated type. For purposes of geometric design, each design vehicle has larger physical dimensions and a larger minimum turning radius than those of almost all vehicles in its class.

The selected design vehicle significantly affects intersection design, including horizontal and vertical alignments, lane widths, inscribed circle diameter, turning radii, lane assignments, intersection sight distance, storage length of auxiliary lanes, and acceleration and deceleration lengths on auxiliary lanes.

The *AASHTO Green Book* includes a variety of design vehicles. The dimensions of these vehicles are presented in *Table 3-1*. The choice of design vehicle is influenced by the functional classification of a roadway and by the proportions of the various types and sizes of vehicles expected to use the facility. On SHS facilities, to accommodate truck traffic, one of the semi-trailer vehicles should be considered in design. In urban areas that are highly built-up, intersections may be designed to provide fully for

3.13 TURNING ROADWAYS

In most cases, turning roadways are designed for use by right turning traffic. There are three basic types of right turning roadways at intersections: (1) a minimum edge of traveled way design, (2) a design with a corner triangular island, (3) a free flow design using a simple radius or compound radii. The turning radii and the pavement cross slopes for free-flow right turns are functions of design speed and type of vehicles.

3.13.1 Minimum Edge of Traveled Way Design

When turning vehicles are to be accommodated within minimum space, corner radii should be based on the minimum turning paths of the selected design vehicles. **Table 3-7** and **Table 3-8** summarize the minimum edge of traveled way design for various design vehicles. These minimum designs provide for the minimum turning paths attainable at speeds equal to or less than 10 mph. **Figure 3-14** demonstrates the angle of reference for use in these tables.

In urban areas, corner radii should satisfy the needs of the road users using them, the amount of right of way available, the angle of turn between intersection legs, the number of pedestrians using the crosswalk, the width and number of lanes on the intersecting street and the speeds on each street. Guidelines for corner radii in urban areas are as follows:

1. Radii of 15 to 25 feet are adequate for passenger vehicles. These radii are suitable for minor cross streets where there is little occasion for trucks to turn and at major intersections where there are parking lanes;
2. Radii of 25 feet or more should be provided at minor cross streets, on new construction and on reconstruction projects;
3. Radii of 30 feet or more should be provided at minor cross streets where practical so that an occasional truck can turn without too much encroachment;
4. Radii of 40 feet or more or preferably three-centered curves or simple curves with tapers to fit the paths of large truck combinations, should be provided where such combinations or buses turn frequently. Where speed reductions would cause problems, longer radii should be considered; and,
5. Curb radii should be coordinated with crosswalk distances or special designs should be used to make crosswalks efficient for all pedestrians. Where larger radii are used, an intermediate refuge or median island is desirable or crosswalks may need to be offset so that crosswalk distances are not objectionable.

Final Report

Contract No. BDK80 977-32

Comprehensive Study to Reduce Pedestrian Crashes in Florida

Prepared for:



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December 2013

(Revised March 2014)

- Very old pedestrians have a greater severity risk at signalized locations compared to non-signalized locations.
- At signalized locations, rainy weather was associated with a slight increase in the probability of severe injuries compared to other weather conditions.
- Dark conditions, with and without street light, were associated with an increase in the probability of severe injuries at both signalized and non-signalized locations.
- At non-signalized locations, vans were found to be associated with an increase in the probability of severe injuries compared to other vehicle types.
- Increasing the speed limit at signalized and non-signalized locations was associated with higher severe injury probability.
- The increase in speed limit at non-signalized locations posed greater pedestrian severity risk compared to signalized locations.
- At non-signalized locations, pedestrians crossing the roadway were associated with higher probability of severe injuries compared to pedestrians walking along the roadway.
- At signalized locations, increasing the AADT and the percentage of trucks significantly increased the probability of severe pedestrian injuries.
- At signalized locations, the probability of severe pedestrian injuries was higher during the night and dawn off-peak periods.

Pedestrian Crash Causes and Countermeasures at Signalized Locations

Urban signalized intersections with observed pedestrian crash frequency greater than three standard deviations from the average crash frequency were identified and analyzed. A total of 21 signalized intersections with ≥ 6 pedestrian crashes during 2008 -2010 were included in the analysis. Police reports of all the crashes that occurred at these high crash intersections were reviewed and the crash contributing factors related to each of the following six types of crashes were analyzed:

1. Crashes that involved right-turning vehicles.
2. Crashes that involved left-turning vehicles.
3. Crashes that occurred in the vicinity of bus stops.
4. Crashes that involved pedestrians who were not crossing at designated crossing locations.
5. Crashes that occurred in left-turning lanes and right-most lanes.
6. Crashes that involved pedestrians in a crosswalk and through traffic.

Pedestrian crashes involving turning traffic at signalized intersections could be prevented by eliminating the potential vehicle-pedestrian conflicts. At locations with high pedestrian volumes, prohibiting right turns on red could be an easy strategy to minimize pedestrian conflicts involving right-turning vehicles. Additionally, providing a leading pedestrian interval (LPI) that gives pedestrians a head start while crossing the intersection could improve pedestrian safety. Pedestrian crashes involving left-turning vehicles could be reduced by providing either a protected left-turn phase or an exclusive protected pedestrian signal.

Several pedestrian crashes occurred when the pedestrian walked in front of the bus onto the approaching traffic. These types of pedestrian crashes could be prevented by improving roadway lighting and providing curb extensions in the vicinity of bus stops. Furthermore, relocating near-

south leg of the intersection shown in Figure 6-10. Figure 6-22 gives an example of a pedestrian crash involving a right-turning vehicle. In such scenarios, prohibiting right turns on red could be an easy strategy to minimize pedestrian conflicts involving right-turning vehicles.

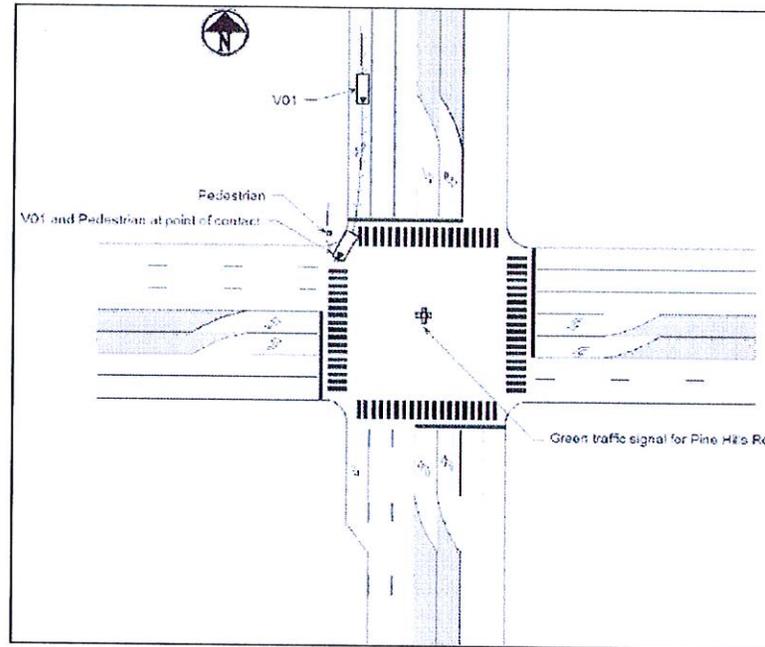


Figure 6-22: Pedestrian Crash Involving Right-turning Vehicle (Crash ID: 819722650)

At intersections with high right-turning traffic and pedestrian volumes, a leading pedestrian interval (LPI) could improve pedestrian safety. The LPI, also known as “Pedestrian Head Start” or “Delayed Vehicle Green” provides the “Walk” signal for additional 3-5 seconds before the adjacent through movement phase. This strategy gives pedestrians a head start while crossing the intersection, reducing conflicts between pedestrians in the crosswalk and the right-turning vehicles. It also makes the pedestrians more visible (Cheng, 2012). Figure 6-23 gives the ring-barrier diagram with LPI signal phase. Figure 6-24 illustrates the LPI signal.

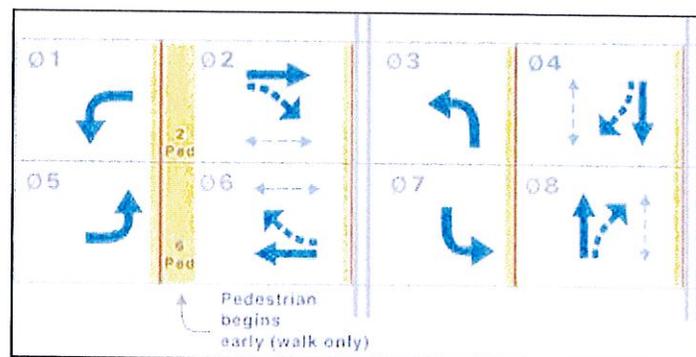


Figure 6-23: Ring-Barrier Diagram with a Leading Pedestrian Interval (Koonce et al., 2008)

Pedestrian fatality risk as a function of car impact speed

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Abstract: Knowledge of the amount of violence tolerated by the human body is essential when developing and implementing pedestrian safety strategies. When estimating the potential benefits of new countermeasures, the pedestrian fatality risk as a function of impact speed is of particular importance. Although this function has been analysed previously, we state that a proper understanding does not exist. Based on the largest in-depth, pedestrian accident study undertaken to date, we derive an improved risk function for adult pedestrians hit by the front of passenger cars. Our results show far lower fatality risks than generally reported in the traffic safety literature. This discrepancy is primarily explained by sample bias towards severe injury accidents in earlier studies. Nevertheless, a strong dependence on impact speed is found, with the fatality risk at 50 km/h being more than twice as high as the risk at 40 km/h and more than five times higher than the risk at 30 km/h. Our findings should have important implications for the development of pedestrian accident countermeasures worldwide. In particular, the scope of future pedestrian safety policies and research should be broadened to include accidents with impact speeds exceeding 50 km/h.

Keywords: Pedestrian; fatality risk; logistic regression; impact speed

1. Introduction

Road traffic accidents are a global health problem claiming approximately 1.2 million fatalities per annum (WHO, 2004). The largest group of road user fatalities are pedestrians hit by motorised vehicles (Mohan, 2002; Odero et al., 1997; WHO, 2004), which will increase further with the motorisation of countries such as China and India (Kopits & Cropper, 2005; WHO, 2004). In the western world, typically 10 to 30% of all road accident fatalities are pedestrians (IRTAD, 2008; WHO, 2004). In many other countries, these proportions are substantially higher, although the exact figures are often difficult to assess (IRTAD, 2008; Mohan, 2002; Odero et al., 1997; WHO, 2004). Thus, there is a compelling need for worldwide implementation of effective pedestrian injury mitigation and crash avoidance countermeasures.

The concept of risk can be interpreted according to scientific context. In traffic safety literature, it is common to define the pedestrian fatality risk as the probability of death, given that the pedestrian was hit by a motorised vehicle and also injured. This is because very little data exist on crashes involving only uninjured pedestrians. We also note that pedestrian fatalities generally include only deaths occurring within 30 days as a result of a motor vehicle crash.

Within certain groups of the traffic safety community, there is presently a perceived consensus that the risk of pedestrian death is a well-known function of car impact speed. Typically, the fatality risk has been reported at 40 to 90% at an impact speed of 50 km/h

Table 2: Distributions of pedestrian injury severities

	Slight	Severe	Fatal
National (2003–2007)	70.9%	27.0%	2.2%
Total GIDAS	53.2%	42.1%	4.7%
Final sample	44.4%	48.2%	7.3%

Table showing the distributions of slightly, severely, and fatally injured pedestrians in the national statistics (Verkehrsunfälle, 2003–2007), the total GIDAS sample, and the final GIDAS sample (N=490). These figures were used to derive the weight factors.

3.3 Statistical methods

The distributions of pedestrian age, gender, height, and weight were investigated for both the total sample (N=490) and the fatalities (N=36). These empirical investigations were aimed at providing us with an understanding of the data and the problem at hand.

Logistic regression analysis was applied to the weighted sample in order to derive an analytical expression for the pedestrian fatality risk as a function of impact speed. The probability of death, $P(v)$, was then assumed to have the following form

$$P(v) = \frac{1}{1 + \exp(-a - bv)} \quad (1)$$

where v is the impact speed and a , b , two parameters to be estimated by the method of maximum likelihood (Dobson, 2002; McCullagh & Nelder, 1989). The effects of pedestrian age, gender, height, and weight were investigated by applying multiple logistic regression analysis. The main objective of the latter analysis was to find an improved, multivariate function describing pedestrian fatality risk. The model selection was based on a subset of 353 cases, including 21 fatalities, for which all the additional variables were known. We treated age, height, and weight as continuous variables, while gender was nominal.

Model fit investigations were based on Akaike's information criterion (Akaike, 1974), likelihood ratio tests, and Wald chi-square statistics, as well as visual assessment of residuals and influence diagnostics. Some further details are provided in Appendix B.

Table 3: Summary of empirical data

Speed (km/h)	Cases	Fatalities	Rate (%)	Wgt rate (%)	Speed (km/h)	Cases	Fatalities	Rate (%)	Wgt rate (%)
1–9	35	0	0	0	60–69	18	5	28	22
10–19	93	2	2.2	0.92	70–79	8	6	75	69
20–29	99	1	1.0	0.44	80–89	2	1	50	42
30–39	103	4	3.9	1.9	90–99	4	4	100	100
40–49	99	5	5.1	2.9	100–109	1	1	100	100
50–59	27	7	26	18	110–119	1	0	0	0

The total number of observed cases and fatalities by impact speed interval for raw data. Fatality rates are provided for both raw and weighted data.

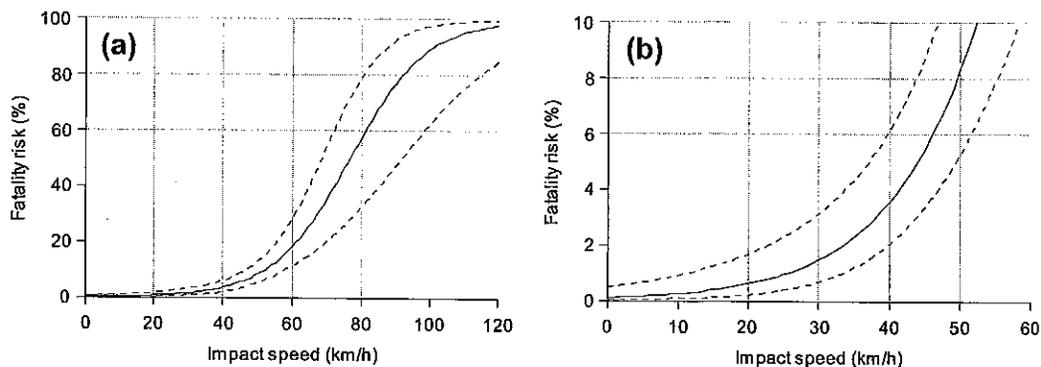


Figure 1: Pedestrian fatality risk

(a) The fatality risk as a function of impact speed for adult pedestrians hit by the front of a passenger car. The dotted curves show approximate 95% confidence limits. (b) Zoom in on the risk curve below 60 km/h.

4. Results

Table 3 shows the number of pedestrians and the fatality rates observed at different impact speed intervals. Comparing the raw and weighted fatality rates, we see that the effects of weighting decreased at higher impact speeds. We applied logistic regression analysis to fit an analytical function to the weighted fatality rates at all observed impact speeds. The resulting fatality risk function is presented in equation (2), where the impact speed, v , is measured in km/h.

$$P(v) = \frac{1}{1 + \exp(6.9 - 0.090v)} \quad (2)$$

The fatality risk function is also displayed in Fig. 1 together with an approximate 95% confidence band (see Appendix B for the mathematical formula). Zooming in on the risk curve at impact speeds below 60 km/h (Fig. 1b), we see that the relative risk increases rapidly with impact speed, which is in line with previous literature. However, the absolute risks are substantially lower than those generally reported (cf. the risk estimates by Anderson et al., 1997; Ashton, 1982; Pasanen, 1992; and Yaksich, 1964 given in Table 1, which have been the basis for the generally reported fatality risks).

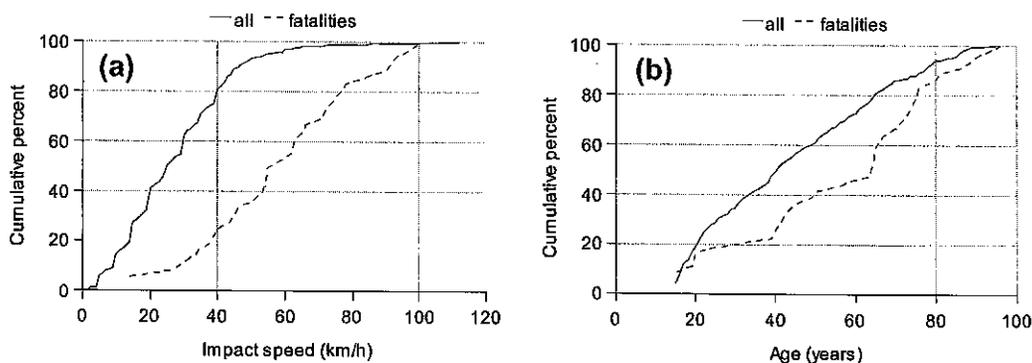


Figure 2: Distributions of impact speed and age

Cumulative distributions of (a) impact speed and (b) age for all pedestrians ($N=490$) and the fatalities ($N=36$).

West's Florida Statutes Annotated
 Title XXIII. Motor Vehicles (Chapters 316-325)
 Chapter 316. State Uniform Traffic Control (Refs & Annos)

Proposed Legislation

Effective: July 2, 2013

West's F.S.A. § 316.0083

**316.0083. Mark Wandall Traffic Safety Program; administration;
 report**

Currentness

Citations
 Construction and application
 Equal protection
 Local hearing officers
 Private vendors
 Validity

(1)(a) For purposes of administering this section, the department, a county, or a municipality may authorize a traffic infraction enforcement officer under s. 316.640 to issue a traffic citation for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. A notice of violation and a traffic citation may not be issued for failure to stop at a red light if the driver is making a right-hand turn in a careful and prudent manner at an intersection where right-hand turns are permissible. A notice of violation and a traffic citation may not be issued under this section if the driver of the vehicle came to a complete stop after crossing the stop line and before turning right if permissible at a red light, but failed to stop before crossing over the stop line or other point at which a stop is required. This paragraph does not prohibit a review of information from a traffic infraction detector by an authorized employee or agent of the department, a county, or a municipality before issuance of the traffic citation by the traffic infraction enforcement officer. This paragraph does not prohibit the department, a county, or a municipality from issuing notification as provided in paragraph (b) to the registered owner of the motor vehicle involved in the violation of s. 316.074(1) or s. 316.075(1)(c) 1.

(b) 1. a. Within 30 days after a violation, notification must be sent to the registered owner of the motor vehicle involved in the violation specifying the remedies available under s. 318.14 and that the violator must pay the penalty of \$158 to the department, county, or municipality, or furnish an affidavit in accordance with paragraph (d), or request a hearing within 60 days following the date of the notification in order to avoid the issuance of a traffic citation. The notification must be sent by first-class mail. The mailing of the notice of violation constitutes notification.

b. Included with the notification to the registered owner of the motor vehicle involved in the infraction must be a notice that the owner has the right to review the photographic or electronic images or the streaming video evidence that constitutes a rebuttable presumption against the owner of the vehicle. The notice must state the time and place or Internet location where the evidence may be examined and observed.

c. Notwithstanding any other provision of law, a person who receives a notice of violation under this section may request a hearing within 60 days following the notification of violation or pay the penalty pursuant to the notice of violation, but a payment or fee may not be required before the hearing requested by the person. The notice of violation must be accompanied by, or direct the person to a website that provides, information on the person's right to request a hearing and on all court costs related thereto and a form to request a hearing. As used in this sub-subparagraph, the term "person" includes a natural person, registered owner or coowner of a motor vehicle, or person identified on an affidavit as having care, custody, or control of the motor vehicle at the time of the violation.

d. If the registered owner or coowner of the motor vehicle, or the person designated as having care, custody, or control of the motor vehicle at the time of the violation, or an authorized representative of the owner, coowner, or designated person, initiates a proceeding to challenge the violation pursuant to this paragraph, such person waives any challenge or dispute as to the delivery of the notice of violation.

2. Penalties assessed and collected by the department, county, or municipality authorized to collect the funds provided for in this paragraph, less the amount retained by the county or municipality pursuant to subparagraph 3., shall be paid to the Department of Revenue weekly. Payment by the department, county, or municipality to the state shall be made by means of electronic funds transfers. In addition to the payment, summary detail of the penalties remitted shall be reported to the Department of Revenue.

3. Penalties to be assessed and collected by the department, county, or municipality are as follows:

a. One hundred fifty-eight dollars for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when a driver failed to stop at a traffic signal if enforcement is by the department's traffic infraction enforcement officer. One hundred dollars shall be remitted to the Department of Revenue for deposit into the General Revenue Fund, \$10 shall be remitted to the Department of Revenue for deposit into the Department of Health Emergency Medical Services Trust Fund, \$3 shall be remitted to the Department of Revenue for deposit into the Brain and Spinal Cord Injury Trust Fund, and \$45 shall be distributed to the municipality in which the violation occurred, or, if the violation occurred in an unincorporated area, to the county in which the violation occurred. Funds deposited into the Department of Health Emergency Medical Services Trust Fund under this sub-subparagraph shall be distributed as provided in s. 395.4036(1). Proceeds of the infractions in the Brain and Spinal Cord Injury Trust Fund shall be distributed quarterly to the Miami Project to Cure Paralysis and used for brain and spinal cord research.

b. One hundred fifty-eight dollars for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when a driver failed to stop at a traffic signal if enforcement is by a county or municipal traffic infraction enforcement officer. Seventy dollars shall be remitted by the county or municipality to the Department of Revenue for deposit into the General Revenue Fund, \$10 shall be remitted to the Department of Revenue for deposit into the Department of Health Emergency Medical Services Trust Fund, \$3 shall be remitted to the Department of Revenue for deposit into the Brain and Spinal Cord Injury Trust Fund, and \$75 shall be retained by the county or municipality enforcing the ordinance enacted pursuant to this section. Funds deposited into the Department of Health Emergency Medical Services Trust Fund under this sub-subparagraph shall be distributed as provided in s. 395.4036(1). Proceeds of the infractions in the Brain and Spinal Cord Injury Trust Fund shall be distributed quarterly to the Miami Project to Cure Paralysis and used for brain and spinal cord research.

4. An individual may not receive a commission from any revenue collected from violations detected through the use of a traffic infraction detector. A manufacturer or vendor may not receive a fee or remuneration based upon the number of violations detected through the use of a traffic infraction detector.

(c) 1. a. A traffic citation issued under this section shall be issued by mailing the traffic citation by certified mail to the address of the registered owner of the motor vehicle involved in the violation if payment has not been made within 60 days after notification under paragraph (b), if the registered owner has not requested a hearing as authorized under paragraph (b), or if the registered owner has not submitted an affidavit under this section.

b. Delivery of the traffic citation constitutes notification under this paragraph. If the registered owner or coowner of the motor vehicle, or the person designated as having care, custody, or control of the motor vehicle at the time of the violation, or a duly authorized representative of the owner, coowner, or designated person, initiates a proceeding to challenge the citation pursuant to this section, such person waives any challenge or dispute as to the delivery of the traffic citation.

c. In the case of joint ownership of a motor vehicle, the traffic citation shall be mailed to the first name appearing on the registration, unless the first name appearing on the registration is a business organization, in which case the second name appearing on the registration may be used.

2. Included with the notification to the registered owner of the motor vehicle involved in the infraction shall be a notice that the owner has the right to review, in person or remotely, the photographic or electronic images or the streaming video evidence that constitutes a rebuttable presumption against the owner of the vehicle. The notice must state the time and place or Internet location where the evidence may be examined and observed.

(d) 1. The owner of the motor vehicle involved in the violation is responsible and liable for paying the uniform traffic citation issued for a violation of s. 316.074(1) or s. 316.075(1)

(c) 1. when the driver failed to stop at a traffic signal, unless the owner can establish that:

a. The motor vehicle passed through the intersection in order to yield right-of-way to an emergency vehicle or as part of a funeral procession;

b. The motor vehicle passed through the intersection at the direction of a law enforcement officer;

c. The motor vehicle was, at the time of the violation, in the care, custody, or control of another person;

d. A uniform traffic citation was issued by a law enforcement officer to the driver of the motor vehicle for the alleged violation of s. 316.074(1) or s. 316.075(1)(c) 1.; or

e. The motor vehicle's owner was deceased on or before the date that the uniform traffic citation was issued, as established by an affidavit submitted by the representative of the motor vehicle owner's estate or other designated person or family member.

2. In order to establish such facts, the owner of the motor vehicle shall, within 30 days after the date of issuance of the traffic citation, furnish to the appropriate governmental entity an affidavit setting forth detailed information supporting an exemption as provided in this paragraph.

a. An affidavit supporting an exemption under sub-subparagraph 1.c. must include the name, address, date of birth, and, if known, the driver license number of the person who leased, rented, or otherwise had care, custody, or control of the motor vehicle at the time of the alleged violation. If the vehicle was stolen at the time of the alleged offense, the affidavit must include the police report indicating that the vehicle was stolen.

b. If a traffic citation for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. was issued at the location of the violation by a law enforcement officer, the affidavit must include the serial number of the uniform traffic citation.

c. If the motor vehicle's owner to whom a traffic citation has been issued is deceased, the affidavit must include a certified copy of the owner's death certificate showing that the date of death occurred on or before the issuance of the uniform traffic citation and one of the following:

(I) A bill of sale or other document showing that the deceased owner's motor vehicle was sold or transferred after his or her death, but on or before the date of the alleged violation.

(II) Documentary proof that the registered license plate belonging to the deceased owner's vehicle was returned to the department or any branch office or authorized agent of the department, but on or before the date of the alleged violation.

(III) A copy of a police report showing that the deceased owner's registered license plate or motor vehicle was stolen after the owner's death, but on or before the date of the alleged violation.

Upon receipt of the affidavit and documentation required under this sub-subparagraph, the governmental entity must dismiss the citation and provide proof of such dismissal to the person that submitted the affidavit.

3. Upon receipt of an affidavit, the person designated as having care, custody, or control of the motor vehicle at the time of the violation may be issued a notice of violation pursuant to paragraph (b) for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when the driver failed to stop at a traffic signal. The affidavit is admissible in a proceeding pursuant to this section for the purpose of providing proof that the person identified in the affidavit was in actual care, custody, or control of the motor vehicle. The owner of a leased vehicle for which a traffic citation is issued for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when the driver failed to stop at a traffic signal is not responsible for paying the traffic citation and is not required to submit an affidavit as specified in this subsection if the motor vehicle involved in the violation is registered in the name of the lessee of such motor vehicle.

4. Paragraphs (b) and (c) apply to the person identified on the affidavit, except that the notification under sub-subparagraph (b)1.a. must be sent to the person identified on the affidavit within 30 days after receipt of an affidavit.

5. The submission of a false affidavit is a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

(e) The photographic or electronic images or streaming video attached to or referenced in the traffic citation is evidence that a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when the driver failed to stop at a traffic signal has occurred and is admissible in any proceeding to enforce this section and raises a rebuttable presumption that the motor vehicle named in the report or shown in the photographic or electronic images or streaming video evidence was used in violation of s. 316.074(1) or s. 316.075(1)(c) 1. when the driver failed to stop at a traffic signal.

(2) A notice of violation and a traffic citation may not be issued for failure to stop at a red light if the driver is making a right-hand turn in a careful and prudent manner at an intersection where right-hand turns are permissible.

(3) This section supplements the enforcement of s. 316.074(1) or s. 316.075(1)(c) 1. by law enforcement officers when a driver fails to stop at a traffic signal and does not prohibit a law enforcement officer from issuing a traffic citation for a violation of s. 316.074(1) or s. 316.075(1)(c) 1. when a driver fails to stop at a traffic signal in accordance with normal traffic enforcement techniques.

(4)(a) Each county or municipality that operates a traffic infraction detector shall submit a report by October 1, 2012, and annually thereafter, to the department which details the results of using the traffic infraction detector and the procedures for enforcement for the preceding state fiscal year. The information submitted by the counties and municipalities must include statistical data and information required by the department to complete the report required under paragraph (b).

(b) On or before December 31, 2012, and annually thereafter, the department shall provide a summary report to the Governor, the President of the Senate, and the Speaker of the House of Representatives regarding the use and operation of traffic infraction detectors under this section, along with the department's recommendations and any necessary legislation. The summary report must include a review of the information submitted to the department by the counties and municipalities and must describe the enhancement of the traffic safety and enforcement programs.

(5) Procedures for a hearing under this section are as follows:

(a) The department shall publish and make available electronically to each county and municipality a model Request for Hearing form to assist each local government administering this section.

(b) The charter county, noncharter county, or municipality electing to authorize traffic infraction enforcement officers to issue traffic citations under paragraph (1)(a) shall designate by resolution existing staff to serve as the clerk to the local hearing officer.

(c) Any person, herein referred to as the "petitioner," who elects to request a hearing under paragraph (1)(b) shall be scheduled for a hearing by the clerk to the local hearing officer to appear before a local hearing officer with notice to be sent by first-class mail. Upon receipt of the notice, the petitioner may reschedule the hearing once by submitting a written request to reschedule to the clerk to the local hearing officer, at least 5 calendar days before the day of the originally scheduled hearing. The petitioner may cancel his or her appearance before the local hearing officer by paying the penalty assessed under paragraph (1)(b), plus \$50 in administrative costs, before the start of the hearing.

(d) All testimony at the hearing shall be under oath and shall be recorded. The local hearing officer shall take testimony from a traffic infraction enforcement officer and the petitioner, and may take testimony from others. The local hearing officer shall review the photographic or electronic images or the streaming video made available under sub-subparagraph(1)(b)1.b. Formal rules of evidence do not apply, but due process shall be observed and govern the proceedings.

(e) At the conclusion of the hearing, the local hearing officer shall determine whether a violation under this section has occurred, in which case the hearing officer shall uphold or dismiss the violation. The local hearing officer shall issue a final administrative order including the determination and, if the notice of violation is upheld, require the petitioner to pay the penalty previously assessed under paragraph (1)(b), and may also require the petitioner to pay county or municipal costs, not to exceed \$250. The final administrative order shall be mailed to the petitioner by first-class mail.

(f) An aggrieved party may appeal a final administrative order consistent with the process provided under s. 162.11.

Credits

Added by Laws 2010, c. 2010-80, § 5, eff. July 1, 2010. Amended by Laws 2012, c. 2012-174, § 98, eff. July 1, 2012; Laws 2012, c. 2012-181, §§ 3, 74, eff. Jan. 1, 2013; Laws 2013, c. 2013-15, § 43, eff. July 2, 2013; Laws 2013, c. 2013-160, § 5, eff. July 1, 2013.

Editors' Notes

RESEARCH REFERENCES

Encyclopedias

Mark Wandall Traffic Safety Program; Administration; Report, Fla. Jur. 2d Automobiles and Other Vehicles § 320.50.

NOTES OF DECISIONS

Citations

Pursuant to Chapter 2010-80, Laws of Florida, a city has a maximum of sixty days from the date of a violation in which it may issue a traffic citation pursuant to the act. This period reflects the maximum of thirty days between the violation and the notification sent to the registered owner of the motor vehicle and the subsequent thirty day period provided to the vehicle's registered owner within which to pay the penalty in order to avoid court fees, costs, and the issuance of a traffic citation. Florida Op.Atty.Gen., 2010-35, August 26, 2010 (2010 WL 3417283).

Local hearing officers

The language of § 316.003(91) appears to provide an ex officio exception to the constitutional dual office-holding prohibition for currently appointed code enforcement boards or special magistrates for charter county, noncharter county, or municipal code enforcement boards to also act as "local hearing officers" for purposes of conducting hearings related to violations of § 316.0083. However, civil traffic infraction hearing officers have not been included by the Legislature within the scope of this ex officio exemption and would violate Const. Art. II, § 5(a) by simultaneously serving in both offices. Florida Op.Atty.Gen., 2013-18, September 11, 2013 (2013 WL 5175951).

West's F. S. A. § 316.0083, FL ST § 316.0083

Current through Ch. 255 (End) of the 2014 Sp. "A" Sess. of the Twenty-Third Legislature

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