COUNTYWIDE EMERGENCY VEHICLE PREEMPTION STUDY

For

VOLUSIA COUNTY

Prepared for:

VOLUSIA COUNTY MPO

Task Assignment 2009-1-1
TEDS Contract Number 10210
July 2009

Prepared by:

Traffic Engineering Data Solutions, Inc.
27 S. US 17/92, Unit 2
DeBary, Florida 32713
www.teds-fl.com

Table of Contents

List of Figures

List of Tables

EXECUTIVE SUMMARY

Volusia County Metropolitan Planning Organization (MPO) contracted Traffic Engineering Data Solutions, Inc. (TEDS) to conduct a study on emergency vehicle preemption. The study's purpose is to determine which preemption system should be utilized throughout Volusia County. A countywide standard allows fire departments responding to an emergency situation to utilize their preemption equipment regardless of jurisdiction. The result would be an overall increase in safety with a reduction in response times.

The study involves forming a committee of stakeholders; performing a crash analysis, corridor analysis, and preliminary cost analysis; collecting and summarizing various fire department inventory and statistics; evaluating various preemption system technologies and recommend an appropriate system; and document the results in a report.

Three (3) types of emergency vehicle preemption were considered including Opticom Infrared (optical), Opticom GPS (radio), and SONEM 2000 (acoustic). The results of the comparison are summarized below:

- SONEM 2000 is the only preemption system that does not require equipment installed in the vehicle.
- Opticom GPS and Infrared are on the Florida Department of Transportation (FDOT) Approved Products List (APL), however, SONEM 2000 does not currently meet the requirements.
- Opticom GPS is the only preemption system not dependent on line of sight.
- Opticom GPS utilizes adjustable activation and left turn dependent mode to reduce the effects of traffic congestion.
- Opticom GPS and Infrared are capable of high priority, low priority, and probe vehicle activation. SONEM 2000 is only capable of high priority preemption.
- Opticom GPS is less complex to install as all intersection equipment is installed in or on the traffic controller cabinet and typically requires no lane closures.

After careful review of each system's capabilities and thorough discussion with fellow committee members it is recommended that Opticom GPS should be utilized countywide. Opticom GPS utilizes radio technology to provide emergency responders a safe and efficient method to traverse a signalized intersection along with minimizing disruption to traffic during installation.

1

INTRODUCTION

In an emergency, the difference between life and death is measured in seconds. Every minute a cardiac arrest victim waits for defibrillation reduces their chance of survival by seven (7) to ten (10) percent as stated in Table 1. If the victim is not successively resuscitated within eight (8) minutes, death is likely. It is vital that emergency responders arrive at the scene promptly and provide immediate defibrillation.

Table 1
Cardiac Arrest Survival Factors as a Function of Time

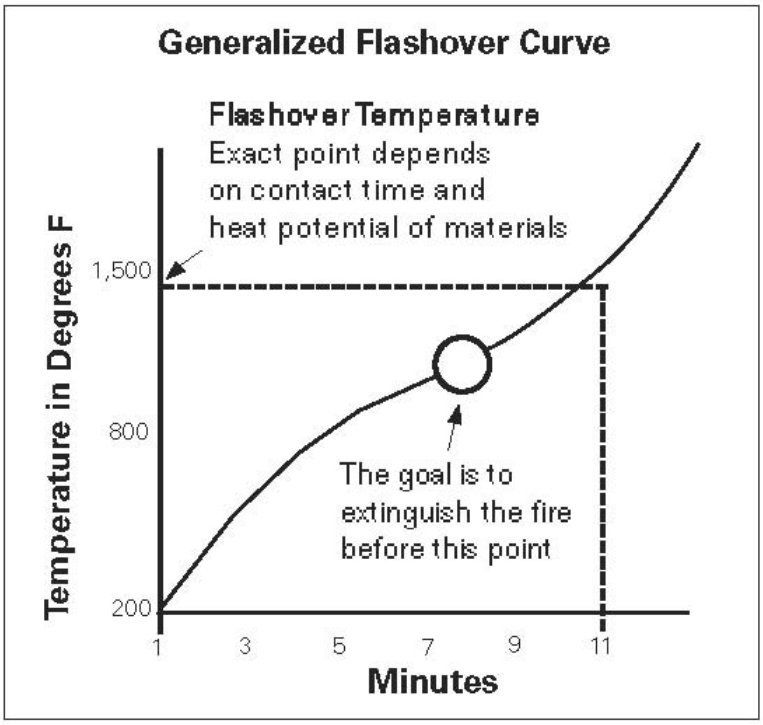
Time Until Defibrilation	Survival Chances
With every minute…	Chances are reduced by 7 - 10%
After 8 minutes…	Little chance of survival

(Source American Heart Association)

During a residential building fire arriving on scene and extinguishing the blaze before flashover occurs reduces the risk to firefighters and the extent of building damage. Flashover occurs when the temperature of most surfaces inside a building increases to a point that all combustible gases within the smoke near the ceiling rapidly ignites, radiating heat toward the floor. This phenomenon is an occupational hazard for firefighters that can lead to injury or death. As shown in Figure 1 to prevent flashover in a residential building the goal is to extinguish the fire within eight (8) minutes of ignition. Once a fire reaches flashover, it typically cannot be extinguished and must burn itself out resulting in a total loss of property.

Traffic congestion and traversing signalized intersections during peak traffic hours cost valuable seconds that can significantly delay the time of arrival of emergency responders to the scene. To provide an effective response, time of arrival must be minimized. Time of arrival is a function of the time it takes to discover the emergency situation and notify the proper authorities, location of necessary emergency equipment, and travel time to the emergency scene. There is little control over how fast an emergency situation is discovered and when the proper authorities are notified. Location of emergency equipment is typically planned to provide the best coverage possible within the constraints of jurisdictional boundaries. To reduce the effects on public safety of jurisdictional boundaries, fire departments share closest unit response agreements. These agreements allow the fire department unit in closest proximity of an emergency to respond regardless of jurisdictional boundaries. Fire departments within Volusia County have closest unit response agreements with adjacent fire departments and Volusia County Fire Services as shown in *Appendix A*.

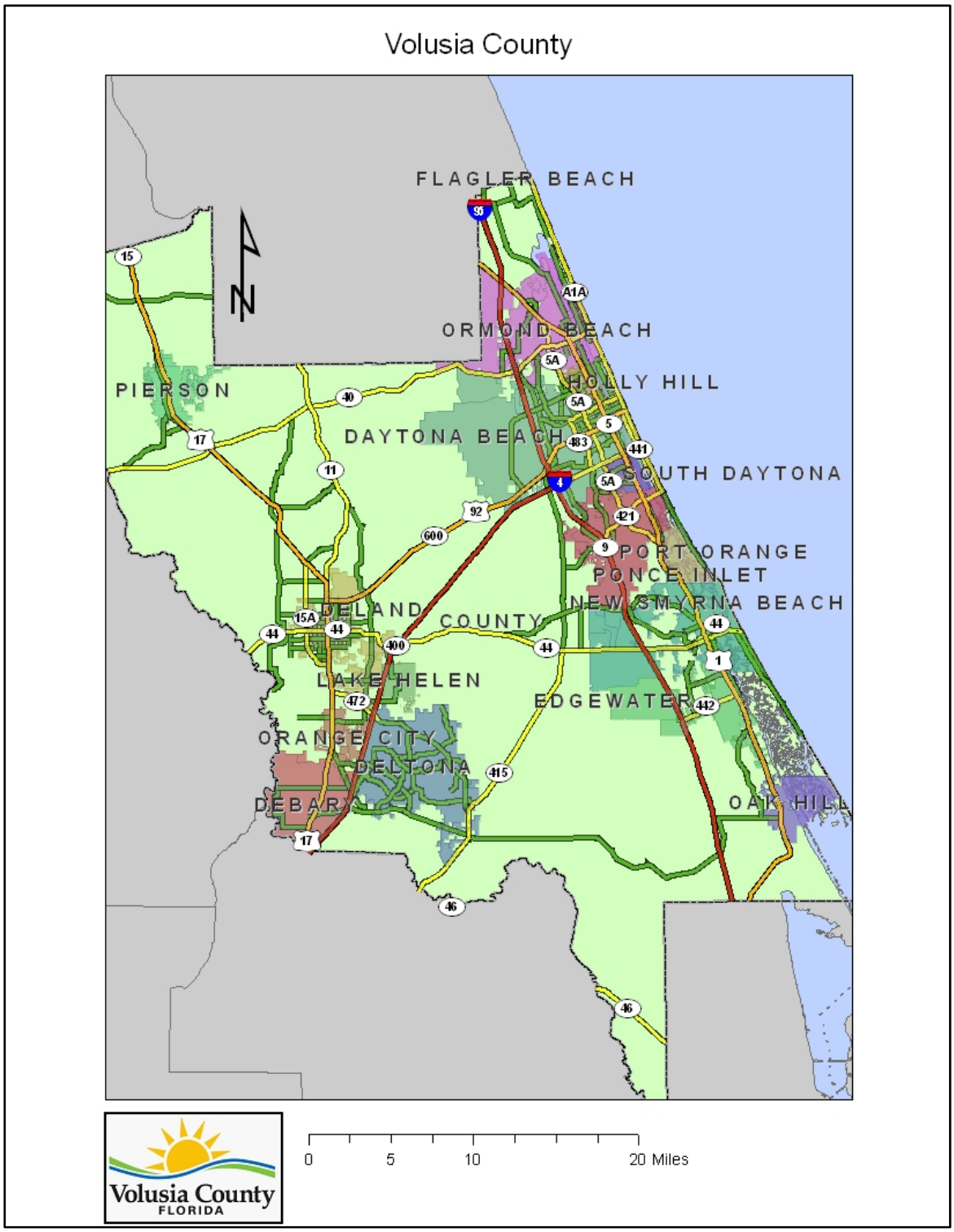
Figure 1
Generalized Flashover Curve for Residential Construction



(Source National Fire Protection Association)

This study focuses on reducing travel time and increasing safety for fire department vehicles responding to an emergency through establishing a countywide standard Emergency Vehicle Preemption System. The project includes all of Volusia County as shown in Figure 2. A committee of Volusia County stakeholders including fire chiefs, city and county officials, MPO representatives, and Florida Department of Transportation personnel was formed to discuss different preemption technologies and which system met the current and future needs of the individual departments and Volusia County as a whole. Committee members and their participation are documented in *Appendix D*. Discussions and comments made during the committee meetings are incorporated in the report.

Figure 2
Project Boundaries



(Source Volusia County)

2

ISSUES

Fire units face many difficult issues while traveling to an emergency scene which contributes to driver fatigue and creates a stressful environment. Issues involving the reaction of other drivers and traversing signalized intersections are typically encountered on every emergency run. Additionally, issues arise when multiple emergency units approach an intersection. Mitigating these issues increases roadway safety and the preparedness of fire fighters once the scene is reached.

Fire department vehicles with flashing lights and blaring sirens head toward an emergency scene often encounter drivers that are chaotic in their response to an approaching fire unit. Reactions vary and include switching lanes then either slowing down or stopping to provide the emergency vehicle right of way. Some drivers simply stop or slow down in their current lane regardless of the emergency vehicle's location. Other drivers don't respond and drive completely oblivious to the situation happening. This is caused in part to an increase in vehicle interior sound dampening combined with cellular phones, radio, and air conditioning.

During an emergency response a fire unit must typically proceed through several signalized intersections, some of which are providing right of way to intersecting traffic. A red light indication during peak period conditions typically result in a significant queue of traffic. Intersection queues are an unpredictable environment that is dynamic which requires the fire unit driver to make tight maneuvers through dense traffic. Compounding this issue, fire engines and other large fire apparatus have poor performance characteristics including deceleration and turning radius. Once the fire unit has finally traversed the queue it still must safely precede through an intersection without having the right of way.

Installation of emergency vehicle preemption equipment would mitigate these issues. A unit equipped with preemption equipment can activate the system upstream of the queue allowing time for dissipation. Even if the queue does not fully dissipate the length and density is reduced allowing for less delay and better maneuvering of the fire department vehicles. Having a green indication when proceeding through the intersection also eliminates most right of way related crashes. These results enhance response times and driver fatigue should be reduced along with an increase in overall intersection safety.

Emergency vehicle preemption reduces response times and risk traversing signalized intersections for emergency vehicles, however, significant coordinated signal disruption may also result. Corridors with tightly spaced signalized intersections require carefully engineered, coordinated signal systems to provide efficient movement along the roadway. Once a traffic controller activates preemption the traffic signal operates independently until the request for preemption ceases. Multiple cycles are then necessary to synchronize the coordinated signal system often resulting in long queues, spillback, and excessive delay. The negative effects are compounded when multiple emergency vehicles respond by traversing the same signal system. Emergency vehicle preemption systems utilize various techniques such as time of arrival estimation to minimize traffic flow disruption.

3

EXISTING CONDITIONS

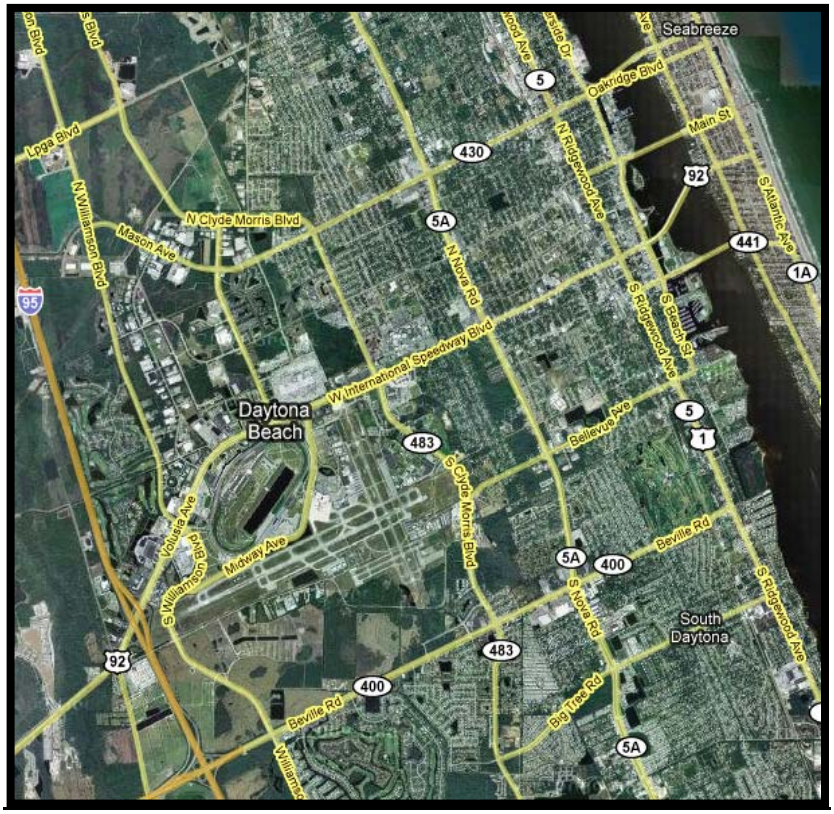
Crash Analysis

A total of fifty-six (56) crashes involving emergency vehicles were reported to Volusia County between 2005 and 2007. Emergency vehicles include all fire department vehicles and privately owned ambulances involved in both emergency and non-emergency runs. Thirty-four (34) of the fifty-six (56) crashes involved fire department vehicles resulting in four (4) injuries. Twenty-one (21) percent of fire department vehicle crashes occurred at signalized intersections, two (2) of which were during emergency runs. Fourteen (14) privately owned ambulance crashes occurred at signalized intersections and during emergency runs resulting in seven (7) injuries. The type of emergency vehicle crashes that occurred at signalized intersections consists of six (6) angle, five (5) rear-end, four (4) sideswipe, four (4) right-turn, one (1) parked vehicle, and one (1) backed-into.

Crash causation was determined for each signalized intersection crash and includes ten (10) failure to yield right of way, nine (9) careless driving, one (1) disregard traffic signal, and one (1) improper turn. This resulted in $81,500 of property damage as estimated by the police officers completing the reports. Installation of emergency vehicle preemption equipment should greatly reduce right of way related crashes at intersections during emergency runs. Detailed results of the crash analysis are provided in *Appendix B*.

Review of all crash locations reveals that the City of Daytona Beach has the highest frequency of emergency vehicle crashes. US 92, US 1, SR 430, SR A1A, SR 5A, and SR 400 are all corridors that would benefit from the installation of emergency vehicle preemption equipment as shown in Figure 3.

Figure 3
Map of Daytona Beach



(Source Google)

Corridor Analysis

Corridors considered for analysis were identified by surveying local fire chiefs on which roadways are most traversed during emergency runs and believe would benefit from installation of an emergency vehicle preemption system. Finalized fire corridors included in the analysis were determined through engineering judgment using the following criteria:

- Countywide preemption was the focus of the project so corridors that connected multiple cities and areas within the county were given priority.
- Corridors have existing information such as average daily traffic and generalized level of service available to be included.
- Corridors contain intersections that experience a high crash frequency.

Emergency vehicle preemption has been installed in cities throughout the country resulting in a reduction in response times, lower emergency vehicle driver fatigue, and lower crash risk. Providing countywide preemption for every fire department and intersection within the county in one project would be beneficial, however, due to tight budgets and lack of supplemental funding this is impractical. Therefore, a ranking system was developed to prioritize and rank the corridors for implementation of emergency vehicle preemption equipment. The ranking system is based on a formula that involves emergency vehicle risk, driver's satisfaction, and operational conditions.

Directly determining the risk of an emergency vehicle being involved in a collision on a certain corridor during an emergency response is impractical. Emergency vehicle crashes are an extremely rare event that has only occurred at a few locations throughout Volusia County between 2005 and 2007. Instead, segment crash rate was chosen as a surrogate measure to determine the risk to an emergency vehicle during an emergency response within a specific corridor. Signalized intersections with high crash rates have a higher probability of a crash, therefore, it is more likely that an emergency vehicle crash would occur at the intersection. Only signalized intersection crashes were included in the calculation since this more accurately identifies risk that could be reduced by installation of preemption equipment.

Driver satisfaction within a corridor is described in terms of level of service which ranges from A (best) through F (worst) as described in Table 2. Level of service information was obtained through the Volusia County website and was determined using the Florida's generalized daily level of service volume tables. The tables are used to make broad planning decisions and are based on the Highway Capacity Manual (2000). Each of the six levels was assigned a numeric value with A equal to 1 through F equal to 6. Using level of service in the formula incorporates the delay drivers of emergency vehicles are likely to encounter as they traverse the corridor.

Table 2
Level of Service

Level of Service	Category Description
A	Free flow, individual users virtually unaffected by the presence of others
B	Stable flow with a high degree of freedom to select operating conditions
C	Flow remains stable, but with significant interactions with others
D	High-density stable flow in which the freedom to maneuver is severely restricted
E	This condition represents the capacity level of the road
F	Forced flow in which the traffic exceeds the amount that can be served

Traffic signals reduce the flow of traffic by allocating intersection capacity to conflicting traffic. Additionally, traffic signals create queues that emergency vehicles must negotiate to proceed through an intersection as shown in Figure 3. Emergency vehicles either wait for queued vehicles to provide access which increases response time or use available two-way center left turn and opposing lanes of traffic to maneuver through the intersection while conflicting traffic has the right of way which increases the risk of being involved in a collision. Emergency vehicle preemption dissipates the queue and mitigates right of way issues encountered while preceded through the intersection.

Figure 4
Intersection Queue

Analysis corridors were broken into homogenous segments according to generalized level of service tables provided by the Volusia County Traffic Engineering office. Each segment was then evaluated utilizing the Segment Priority Score formula to determine which areas of a corridor are most likely to benefit from the installation of preemption equipment. Below is the formula used to calculate the score for each corridor with the Segment Priority Scores shown in Table 2. A detailed spreadsheet evaluating each segment and overall corridors is found in *Appendix C*.

SPS = LOS X NOS X CR

SPS = Segment Priority Score
LOS = Segment Level of Service
NOS = Number of Signalized Intersections
CR = Segment Crash Rate

Table 3
Segment Priority Score (SPS) Summary

Rank	Corridor	Starting Intersection	Ending Intersection	Jurisdiction	SPS
1	SR 430	SR A1A	Halifax Ave.	Daytona Beach	1,666
2	SR 44	Clara Ave.	Amelia Ave.	DeLand	250
3	US 17-92	Plymouth Ave.	SR 44	DeLand	242
4	SR A1A	Oakridge Blvd.	US 92	Daytona Beach	177
5	SR 483	Coquina Point Dr.	Hand Ave.	Ormond Beach	171
6	SR 421	Summer Tree Rd.	Williamson Blvd.	Port Orange	159
7	LPGA Blvd.	Kilgor St.	Derbyshire Rd.	Volusia County	149
8	SR 430	Halifax Ave.	SR A1A	Daytona Beach	144
9	US 1	Fairview Ave.	US 92	Daytona Beach	137
10	SR 430	SR 483	Beach St.	Daytona Beach	128
11	Williamson Blvd.	SR 40	Shopping Center Entrance	Ormond Beach	120
12	US 17	Mercers Fernery Rd.	US 92	DeLand	105
13	US 92	US 1	Beach St.	Daytona Beach	98
14	SR 483	SR 40	S. Forty Tr.	Ormond Beach	91
15	SR 40	I 95	SR 483	Ormond Beach	89
16	Saxon Blvd.	Marker Place Shopping	Enterprise Rd.	Orange City	82
17	US 92	I 95	Williamson Blvd.	Daytona Beach	79
18	SR 483	SR 430	US 92	Daytona Beach	79
19	LPGA Blvd.	Old Kings Rd.	SR 5A	Holly Hill	78
20	US 17-92	SR 44	Euclid Ave.	DeLand	76
		Opticom Installed Segment			

Traffic Signals

To determine which emergency vehicle preemption systems to consider and recommend, existing emergency vehicle preemption systems were identified throughout Volusia County. Additionally, maintenance agreements were determined to identify the responsibilities of all entities within each jurisdiction. Sixty-one (61) intersections are currently utilizing Opticom Infrared within the cities of Ormond Beach, Port Orange, and DeLand. Ormond Beach also has three (3) intersections installed with Opticom GPS. A summary of intersections with existing preemption equipment is shown in Table 3.

Traffic signals within Volusia County are either maintained by a governmental agency or under contract to a governmental agency as shown in *Appendix A*. Traffic signal maintenance includes operating and maintaining the traffic signal equipment at an intersection along with communication lines between intersections and to/from the maintaining agencies office.

The City of Daytona Beach and the City of Deltona maintain most of the traffic signals within their jurisdictional boundaries. The City of Daytona Beach maintains their traffic signals with limited staff while the City of Deltona contracts the service to a private contractor. Volusia County maintains the remaining signals within the County with in-house staff, either due to the signals being in the County or via contract with the local governmental agency.

These maintaining agencies are typically underfunded and stretched to maintain and operate standard traffic signal equipment at a consistent level. The additional maintenance and operation of emergency preemption equipment at the intersection is in some cases charged back to the local fire departments from the public works and/or traffic engineering departments. Volusia County routinely charges the local municipality fire department for maintenance and operation of the emergency preemption equipment installed within an intersection.

Fire Station Information

To complete the preliminary cost analysis it was necessary to identify all fire stations and the fire apparatus they contain as shown in *Appendix A*. Additionally, unit response and/or call information was collected for each department that had the data available and summarized in *Appendix A*. A unit response is defined as the number of times an individual fire unit travels to an emergency scene. A call is defined as the number of emergency situations a fire department receives. There may be multiple unit responses per each call depending on the situation.

Table 4
Existing Preemption Systems

Volusia County Existing Preemption Systems

= Opticom GPS

City of DeLand - Opticom Infrared

US 92 & Garfield Ave.	SR 15A & Glenwood

City of Daytona Beach Shores

SR A1A & Emergency Signal

City of Ormond Beach - Opticom Infrared & GPS

SR 40 & Breakaway Tr.	SR 40 & US 1	SR 5A & Wilmette Ave.
SR 40 & Tymber Creek Rd.	US 1 & Wilmette Ave.	SR 5A & Emergency Signal
SR 40 & Williamson Blvd.	US 1 & Division Av.	SR 5A & Woodlands Blvd.
SR 40 & Seminole Dr.	US 1 & Hand Ave.	SR 5A & Division Ave.
SR 40 & SR 483	SR A1A & Neptune Ave.	SR 5A & Hand Ave.
SR 40 & Old Tomoka Rd.	SR A1A & SR 40	SR 483 & Hand Ave.
SR 40 & SR 5A	SR A1A & Fire Station	
SR 40 & Orchard St.	SR 5A & US 1	

City of Port Orange - Opticom Infrared

US 1 & Herbert St.	SR 5A & US 1	SR 421 & Yorktowne Blvd.
US 1 & Meeker Pl.	SR 483 & Reed Canal Rd.	SR 421 & SR 483
US 1 & Commonwealth Blvd.	SR 483 & Madeline St.	SR 421 & Victoria Gardens Blvd.
SR A1A & Peninsula Dr.	SR 483 & Herbert St.	SR 421 & Swallow Tail Dr.
SR 5A & Madeline Ave.	SR 483 & Willow Run Blvd.	SR 421 & SR 5A
SR 5A & Herbert St.	SR 421 & Williamson Blvd.	SR 421 & Spruce Creek Rd.
SR 5A & Village Tr.	SR 421 & I 95 SB Ramps	SR 421 & US 1
SR 5A & Spruce Creek Blvd.	SR 421 & Taylor Rd.	Williamson Blvd. & Madeline Ave.

City of South Daytona

US 1 & Ferndale Ave.

4

PREEMPTION SYSTEM DESCRIPTION

Three (3) types of emergency vehicle preemption systems were considered including SONEM 2000 (acoustical), Opticom Infrared (optical), and Opticom GPS (radio). Each system incorporates a different technology with varying capabilities, however, all systems meet the basic goal of providing emergency vehicles right of way through a signalized intersection during an emergency response. Other additional capabilities and qualities preferred in a system as discussed during committee meetings include:

- Minimizes the impact to traffic flow.
- Low maintenance
- Provides signal priority for future transit based applications.
- Ability to collect travel time information using probe vehicles without preempting system.

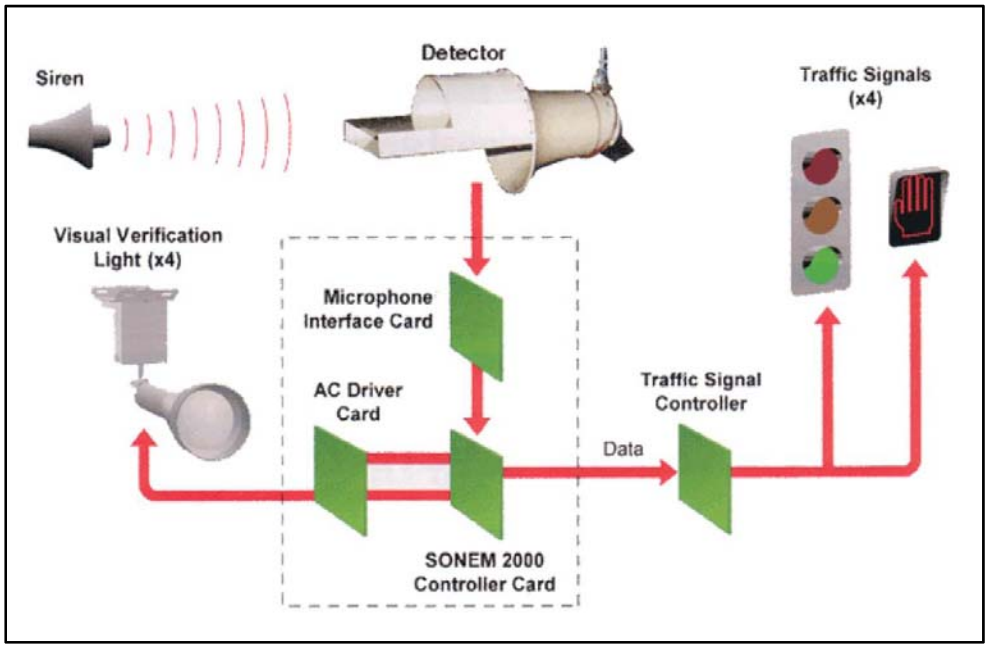
To provide additional capabilities, emergency vehicle preemption systems utilize up to three (3) types of activation including high priority, low priority, and probe vehicle:

- High priority activation is used by emergency vehicles during an emergency response to request preemption from the traffic controller giving the approaching vehicle right of way through the intersection;
- Low priority activation commonly referred to as transit signal priority is used by transit organizations to keep buses arriving on schedule. Instead of preempting the traffic signal, low priority activation either extends green time or truncates red time to reduce delay incurred at signalized intersections along a route. The system is activated on a conditional basis such as level of ridership and tardiness in schedule. While VOTRAN does not currently utilize transit signal priority in Volusia County implementing a system that has the capability allows future implementation; and
- Probe vehicle activation is used in the determination of travel times. This capability allows an equipped vehicle to activate the system without effecting traffic controller function.

SONEM 2000

The SONEM 2000 preemption system utilizes acoustical waves generated by emergency vehicle sirens to request signal preemption at an equipped signalized intersection. The main components of the SONEM 2000 are the detector, controller card, and visual verification light as shown in Figure 3.

Figure 5
SONEM 2000 Hardware Components



(Source: Traffic Systems LLC)

A detector is mounted on the span wire, mast arm, or other structure for each approach to provide the necessary line of sight for the system to function. Acoustical waves from an emergency vehicle's siren is converted to an electrical signal transmitted to the controller card via an 18 gauge shielded twisted pair.

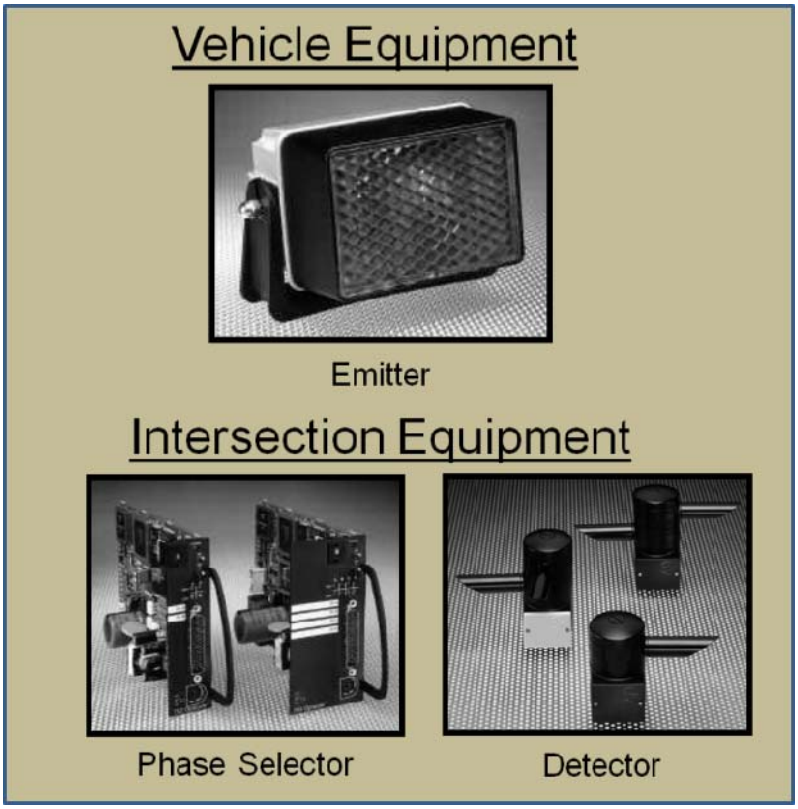
The controller card identifies characteristics of the sound waves such as siren frequency, sound pressure levels, and period. The sound characteristics are utilized to determine from which direction the vehicle is approaching, if the sound waves meet the requirements to request preemption, and to identify the vehicle activating the system. Sirens of all types including yelp, wail, and hi-lo are compatible with the system as long as they meet federal Class A requirements. Utilizing Windows based software and flash memory; up to 4,000 preemptions are logged including date, time, siren type, and duration of preemption information. Additionally, the controller card logs power outages, system resets, and manual preemptions.

Lights mounted on the span wire or mast arm are activated during preemption providing emergency responders an indication that the system is working properly. Once the vehicle has traversed the intersection the controller card clears the preemption request and the intersection returns to normal operation.

Opticom Infrared

Opticom Infrared is an optically based system that utilizes infrared and visible light to communicate between vehicles and traffic controllers to provide signal preemption. The three main components of the Opticom Infrared system are the emitter, detector, and phase selector as shown in Figure 4.

Figure 6
Opticom Infrared Hardware Components



(Source: GTT)

The emitter mounts on the vehicle or is incorporated into light bars. The emitter located on the vehicle transmits an encoded signal to the intersection via infrared and visible light. Utilizing infrared light provides a directional signal that is more reliable than visible light alone in inclement weather. High and low priority preemption is available and accomplished through varying the frequency of the emitter. A third base frequency is utilized by probe vehicles to determine travel times without sending a request to the traffic controller. Additionally, the emitter transmits programmed pulses uniquely identifying the vehicle class and ID number (up to 10,000 discrete vehicles per level of priority).

The optical signal transmitted by the emitter is received by the detector. A detector is mounted on a span wire, mast arm, or other structure to provide the necessary line of sight to the approaching vehicle allowing the system to function correctly. Optical energy up to 2500 feet away is converted by the detector into an electrical signal that is transmitted via cable to the

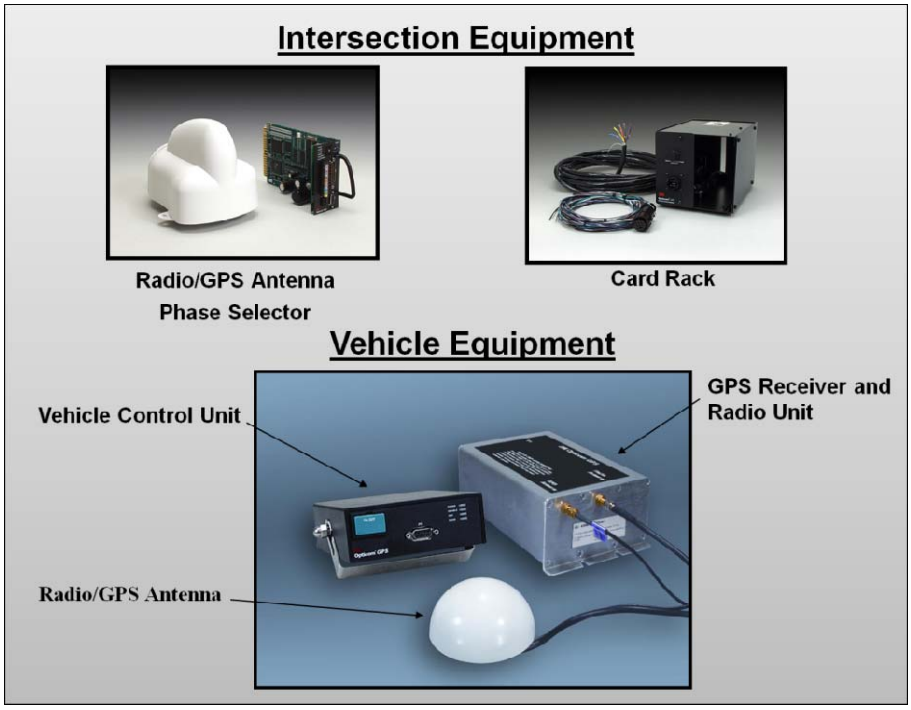
phase selector. Detectors are enclosed in lightweight, durable polycarbonate with adjustable turrets and tubes for flexibility in application.

The phase selector receives the detector's electrical signal and recognizes the emitter frequency identifying the level of priority, vehicle class, and vehicle ID. If the information satisfies the programmed parameters a request for signal preemption is sent to the signal controller. Signals that are determined to be a probe frequency are registered with the phase selector, however, no request for preemption is sent to the traffic controller. Additionally, the phase selector internally logs each activation of the system (up to 1000 entries) including information on time, date, vehicle ID, level of priority, and duration of activation. The log can then be downloaded through a laptop or utilizing central management software. Phase Selectors are available in two and four channel models and are compatible with most traffic signal controllers.

Opticom GPS

Opticom GPS uses a combination of Global Positioning System (GPS) Satellites and 2.4 GHZ spread spectrum radio to provide signal preemption. The system consists of Intersection components and vehicle components as shown in Figure 5.

Figure 7
Opticom GPS Hardware Components



(Source: GTT)

The vehicle equipment includes a vehicle control unit, GPS reciever and radio unit, and antenna. The antenna mounts on the vehicle and is utilized for both GPS and Radio transmission. The GPS receiver and radio unit receives information from the GPS satellites via the antenna and computes the vehicle's location, speed, and heading. The vehicle control unit

stores programmed parameters such as level of priority and the vehicle's unique ID (up to 38 million vehicle ID). Additionally, turn signal actuation is identified and conditional activation information from an automated vehicle location (AVL) is processed. Information is then broadcast using 2.4 GHZ spread spectrum radio.

The main intersection equipment includes an antenna and phase selector. The antenna is mounted at the intersection either on a mast arm or the controller cabinet. The antenna has a range of up to 2500 feet and has no line of sight requirements. Radio transmissions from an equipped vehicle are received by the antenna and sent to the phase selector via cable. The phase selector is located in the controller cabinet connected either directly to the input file of Type 170 traffic controllers or through the use of an available card rack for other controllers with preemption capabilities. Information sent to the phase selector is compared to programmed parameters stored in memory to determine if, when, and which action should be requested from the traffic controller. Additionally, activities for the most recent 10,000 entries are stored including information on duration of activation, date, time, level of priority, approach called, and vehicle ID. The information can be downloaded to a computer via a RS 232 communications port.

Three levels of activation are available including high priority, low priority, and probe vehicle. High priority requests the traffic controller to preempt the traffic signal giving the approaching vehicle the right of way. Low priority is utilized in transit applications on a conditional basis requesting green extension and red truncation from the controller. Probe vehicle activations used in the determination of travel times are logged by the phase selector, however, no request is sent to the traffic controller.

To minimize the disruption to traffic flow adjustable activation and turn signal dependent mode capabilities are available. Adjustable activation utilizes estimated time of arrival calculated from GPS information to more efficiently request priority activation. Turn signal dependent mode utilizes turn signal indication information transmitted from an approaching vehicle to recognize the need for a protected left-turn signal preemption.

5

PRELIMINARY COST ANALYSIS

An analysis was preformed to determine the cost for purchasing and installing the three (3) different emergency vehicle preemption systems and is detailed in *Appendix D* along with a cost comparison in Table 4. The following assumptions were utilized for the analysis:

- Costs were provided by authorized representatives from each manufacturer;
- Only signalized intersections included in the corridor priority analysis were considered;
- Opticom GPS is capable of monitoring all approaches without additional detectors, therefore, cost estimates for the other systems were based on providing the same capability regardless of the functional classification of the intersecting roadway;
- All included fire equipment have sirens that meet Federal Class A requirments.
- Maintaining agencies would share one (1) copy of system software;
- Operation and Maintenance costs were not included and considered minimal. However, these costs are typically charged back to the fire department by the traffic signal maintaining agency;
- Only fire engines, rescue vehicles, and command vehicles were considered for installation of equipment;
- Intersections and fire appuratus upgaded from Opticom Infrared to Opticom GPS received a twenty-five (25) percent “trade up” discount; and
- Number of approaches was determined using straight line diagrams provided by Florida Department of Transportation (FDOT).

Table 5
Cost Comparison

Preemption System	# of Intersections	Total Intersection Cost	# of Apparatus	Cost per Vehicle	Total Vehicle Cost	Total Software Cost	**Total Cost**
SONEM 2000	282	$1,626,600	91	$0	$0	$0	**$1,626,600**
OPTICOM INFRARED	282	$4,097,578	91	$1,610	$132,020	$0	**$4,229,598**
OPTICOM GPS	282	*$2,497,550	91	$3,650	$319,600	$1,000	**$2,818,150**
OPTICOM INFRARED	$17,437 per Intersection = $5,127 (equipment) + $12,310 (installation)						
OPTICOM GPS	$9,175 per Intersection = $6,175 (equipment) + $3000 (Installation) $3,650 per Vehicle = $3,000 (equipment) + $650 (installation) * Price for Upgrade of Existing Opticom Infrared Equipment *$7,850 per Intersection = $4,850(equipment) + $3000 (Installation) *$2,900 per Vehicle = $2,250(equipment) + $650 (installation)						
SONEM 2000	$4,700 per 2 Approaches = $3,700 (equipment) + $1,000 (installation) $5,300 per 3 Approaches = $4,300 (equipment) + $1,000 (installation) $5,900 per 4 Approaches = $4,900 (equipment) + $1,000 (installation)						

NOTE: All Costs came from manufacturer's approved representative.

6

RECOMMENDATIONS

All three (3) preemption systems provide right of way to vehicles responding to an emergency as they approach a signalized intersection. This is accomplished through acoustic, optical, and radio based methods with each system having advantages and disadvantages.

SONEM 2000 is the only system that incorporates existing sirens, eliminating the need and cost for additional vehicle equipment to be installed. All vehicles equipped with a Class A siren are capable of activating the system regardless of siren type (yelp, wail, hi-lo). Since the system utilizes emergency sirens only high priority preemption is available reducing the flexibility of the system. Creating and maintaining a master database that uniquely identifies all emergency vehicles by their siren profile and then downloading the information to each individual intersection is labor intensive and impractical. Installation is more complex than Opticom GPS due to line of sight restrictions that require each approach to utilize a separate detector to recognize approaching vehicles. Additionally, SONEM 2000 is not currently on the approved product list (APL) for the Florida Department of Transportation (FDOT) and cannot be used on the state highway system.

Opticom Infrared is capable of providing both high and low priority activation. Additionally, probe vehicles can silently activate the system for determining travel times. The system is currently on the APL and is installed primarily at intersections in Ormond Beach and Port Orange. Installation is more complex than Opticom GPS due to line of sight restrictions that require each approach to utilize a separate detector to recognize approaching vehicles. Vehicles must be retrofitted with an emitter located on the vehicle or incorporated into the light bar. A potential for system abuse exists if proper coding is not implemented and maintained.

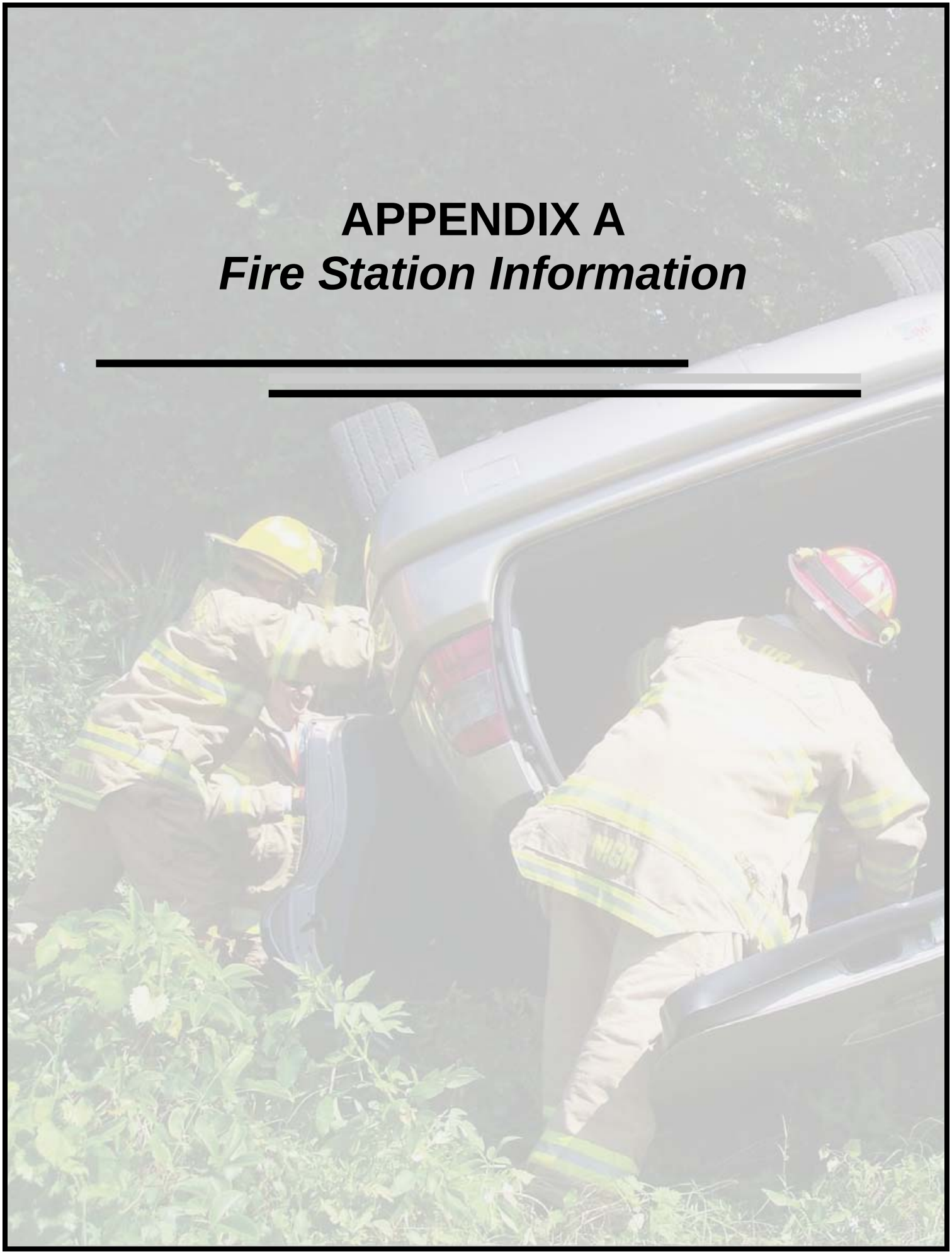
Opticom GPS is the only system that is not line of sight dependent. It is capable of both high and low priority activation and probe vehicle functions. The installation of intersection equipment is less complex than the other systems since all hardware can be mounted in and on the controller cabinet eliminating the need for lane closures. The system is currently installed at three (3) intersections in Ormond Beach with plans for an additional eight (8) intersections. Intersections with Opticom Infrared can be upgraded to Opticom GPS with a 25% trade up policy that does not require existing equipment to be returned to the manufacturer. Utilizing estimated time of arrival to determine when and how long to request preemption decreases the negative effects on traffic flow when compared to the other systems. Left-turn dependent mode, which is only available for Opticom GPS, allows protected left-turn preemption which reduces turn bay congestion allowing the emergency vehicle to turn without using an opposing lane of traffic. System security is ensured though unique vehicle identification preventing unauthorized system use. Additionally, system information is stored and easily downloaded via computer, allowing reports on usage to be developed.

After careful review of each system's capabilities and thorough discussion with fellow committee members it is recommended that Opticom GPS should be utilized countywide. Opticom GPS utilizes sound technology to provide emergency responders a safe and efficient method to transverse a signalized intersection. Additionally, twenty-five (25) percent of the costs already realized by the various agencies who utilize the Opticom Infrared equipment can be credited as a "trade-up" to the Opticom GPS.

References

1. Florida Department of Transportation, District 5: Traffic Operations. (1994). *Tri-County Traffic Signal Preemption Report*
2. Federal Highway Administration. (2006). *Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study*
3. Global Traffic Technologies. (2009). *Opticom GPS System* [Brochure]. St. Paul, MN:
4. Global Traffic Technologies. (2009). *Opticom GPS System, Intersection Equipment* [Brochure]. St. Paul, MN:
5. Global Traffic Technologies. (2009). *Opticom GPS System, Vehicle Equipment* [Brochure]. St. Paul, MN
6. Global Traffic Technologies. (2009). *Opticom Infrared System* [Brochure]. St. Paul, MN:
7. Global Traffic Technologies. (2009). *Opticom Infrared System Model 752, 754 Phase Selector* [Brochure]. St. Paul, MN:
8. Global Traffic Technologies. (2009). *Opticom Infrared System Model 711, 720, 721 Detectors* [Brochure]. St. Paul, MN:
9. Global Traffic Technologies. (2009). *Opticom Infrared System Model 792 Emitter* [Brochure]. St. Paul, MN:
10. Global Traffic Technologies. (2009). *Opticom Infrared System, Central Management Software* [Brochure]. St. Paul, MN:
11. SONEM 2000 Features. Retrieved July 3, 2009, from Traffic Systems LLC Web site: http://www.trafficsystemsllc.com/feat.htm

APPENDIX A
Fire Station Information



Fire Station Information

Closest Unit Response Agreements

		BC	DB	DBS	DEL	DLT	EDG	FLC	HH	LC	NSB	ORC	OB	PIN	PO	SC	SD	VC
Brevard County	BC																	
Daytona Beach	DB			X			X		X		X		X	X	X		X	X
Daytona Beach Shores	DBS		X											X	X			X
DeLand	DEL																	X
Deltona	DLT											X						X
Edgewater	EDG		X						X		X		X	X	X		X	X
Flagler County	FLC																	X
Holly Hill	HH		X				X				X		X	X	X		X	X
Lake County	LC																	X
New Smyrna Beach	NSB		X				X		X				X	X	X		X	X
Orange City	ORC					X												X
Ormond Beach	OB		X				X		X		X			X	X		X	X
Ponce Inlet	PIN		X	X			X		X		X		X		X		X	X
Port Orange	PO		X	X			X		X		X		X	X				X
Seminole County	SC																	X
South Daytona	SD		X				X		X		X		X	X	X			X
Volusia County	VC		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Traffic Signal Maintenance

Maintaining Agency		DB	DBS	DEB	DEL	DLT	EDG	HH	LH	NSB	OH	ORC	OB	PIE	PIN	PO	SD	VC
Daytona Beach	DB	X																
Daytona Beach Shores	DBS																	
Debary	DEB																	
DeLand	DEL																	
Deltona	DLT					X												
Edgewater	EDG																	
Holly Hill	HH																	
Lake Helen	LH																	
New Smyrna Beach	NSB																	
Oak Hill	OH																	
Orange City	ORC																	
Ormond Beach	OB																	
Pierson	PIE																	
Ponce Inlet	PIN																	
Port Orange	PO																	
South Daytona	SD																	
Volusia County	VC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Fire Station Information

Station	Location (Station Name)	Apparatus	Unit Responses 2006	2007	2008	Station Calls 2006	2007	2008
City of Daytona Beach								
Station 1 - 301 S. Beach St.								4,194
		Engine	2,528	2,490	2,546			
		Rescue	3,060	3,084	2,688			
		Battalion	623	692	525			
Station 2 - 126 Botefuhr Ave.								1,430
		Squirt	1,804	1,620	1,464			
Station 3 - 945 N. Halifax Ave.								2,426
		Engine	2,028	1,798	1,526			
		Rescue	953	1,154	1,574			
Station 4 - 1675 Mason Ave.								2,940
		Engine	3,080	3,175	2,421			
		Rescue	1,244	1,382	2,810			
Station 5 - 627 N. Nova Rd.								2,939
		Tower	989	965	966			
		Engine	3,089	2,956	2,986			
		Squad	164	307	250			
Station 6 -2020 Beville Rd.								2,050
		Engine	2,529	2,514	2,530			
Station 7 - 2545 LPGA Blvd.								
		Engine			284 (partial year)			570 (partial year)
		Total	**22,091**	**22,137**	**22,570**			**11,785**
		Average per Shift	**5.0**	**5.0**	**5.0**			**5.4**
City of Deltona								
Station 61 - 1685 Providence Blvd.								
		Ladder	1,895	1,888	2,579			
		Rescue	2,162	2,195	2,009			
Station 62 - 320 Diamond St.								
		Engine	1,928	1,792	1,655			
Station 63 - 2147 Howland Blvd.								
		Engine	2,220	1,552	1,379			
		Engine	179	863	1,236			
Station 64 - 236 Fort Smith Blvd.								
		Engine	1,166	1,099	1,070			
		Total	**9,550**	**9,389**	**9,928**			
		Average per Shift	**4.4**	**4.3**	**4.5**			
City of Deland								
Station 81 - 210 W. Howry Ave.						5,545	4,986	4,601
		Ladder	1859	1577	1546			
		Engine	4776	3569	3469			
		Battalion	1546	1215	1145			
Station 82 - 257 W. International Speedway Blvd.						1,028	1,254	1,545
		Engine	2173	1737	1912			
Station 83 - 1695 E. Taylor Rd.							331	834
		Engine		604	1172			
		Total	**10,354**	**8,702**	**9,244**	**6,573**	**6,571**	**6,980**
		Average per Shift	**7.1**	**4.8**	**5.1**	**9.0**	**6.0**	**6.4**

Fire Station Information

Station	Location (Station Name)	Apparatus	Unit Responses 2006	Unit Responses 2007	Unit Responses 2008	Station Calls 2006	Station Calls 2007	Station Calls 2008
City of Port Orange								
Station 71 - 4200 Ridgewood Ave.						2,788	2,859	2,815
		Engine	1,805	1,796	2,196			
Station 72 - 5839 Trailwood Dr.						2,003	2,002	2,098
		Engine	2,003	1,311	1,761			
Station 73 - 1090 City Center Blvd.						5,301	5,042	4,891
		Engine	2,659	2,506	2,067			
		Squirt	798	796	1,438			
		Battalion	765	631	789			
Station 74 - 6701 Airport Rd.						863	917	899
		Engine	863	567	756			
		Total	**8,893**	**7,607**	**9,007**	**10,955**	**10,820**	**10,703**
		Average per Shift	**4.1**	**3.5**	**4.1**	**7.5**	**7.4**	**7.3**
City of South Daytona								
Station 98 - 1672 S. Ridgewood Ave.								
		Engine	1,986	2,213	2,074	1,986	2,213	2,074
		Total	**1,986**	**2,213**	**2,074**	**1,986**	**2,213**	**2,074**
		Average per Shift	**5.4**	**6.1**	**5.7**	**5.4**	**6.1**	**5.7**
Ctiy of Daytona Beach Shores								
Station 76 - 3050 S. Atlantic Ave.								
		Engine	357	423	492	357	423	492
		Squirt						
		Brush						
		Total	**357**	**423**	**492**	**357**	**423**	**492**
		Average per Shift	**1.0**	**1.2**	**1.3**	**1.0**	**1.2**	**1.3**
Orange City								
Station 67 - 215 N. Holly Ave.						2,894	1,968	2,011
		Engine						
		Ladder						
		Rescue						
		Brush						
		Battalion						
Station 68 - 743 Harley Strickland Blvd.						350	1,522	1,408
		Engine						
		Rescue						
		Total				**3,244**	**3,490**	**3,419**
		Average per Shift				**4.4**	**4.8**	**4.7**
City of Ormond Beach								
Station 91 - 364 S. Atlantic Ave.						836	868	886
		Quint	41	868	896			
Station 92 - 189 S. Nova Rd.						1,892	1,998	2,145
		Quint	1,963	194	261			
		Engine	881	2,134	2,254			
		Brush Attack	19	35	16			
		Battalion	208	296	309			
Station 93 - 300 Wilmette Ave.						1,819	1,825	1,663
		Engine	1,595	1,590	1,519			
		Brush	25	48	37			
Station 94 - 2301 Airport Rd.						692	880	950
		Engine	747	922	846			
		Brush	29	36	18			
		Tender	24	48	51			
		Total	**5,532**	**6,171**	**6,207**	**5,239**	**5,571**	**5,644**
		Average per Shift	**1.5**	**1.7**	**1.7**	**3.6**	**3.8**	**3.9**

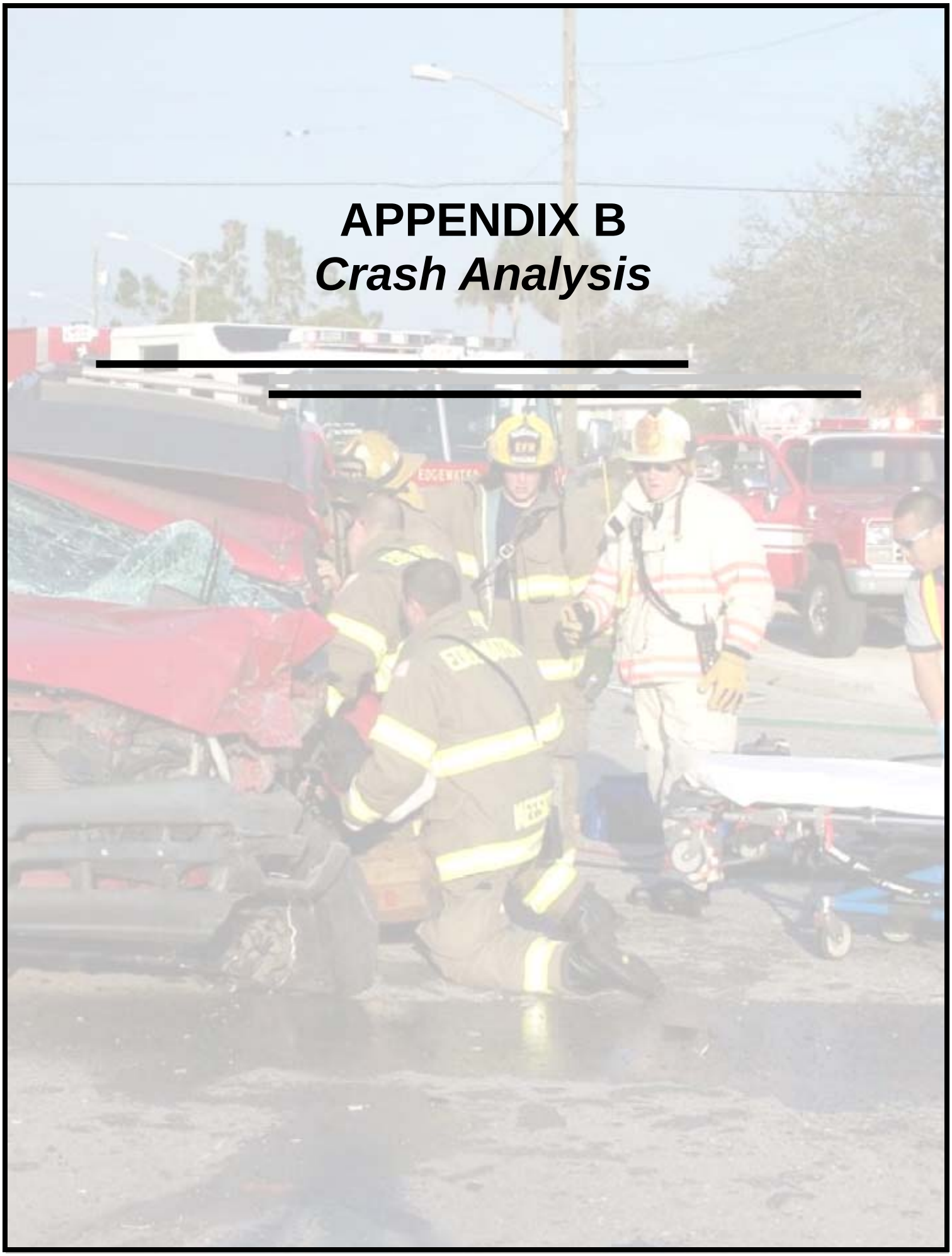
Fire Station Information

Station	Location (Station Name)	Apparatus	Unit Responses 2006	Unit Responses 2007	Unit Responses 2008	Station Calls 2006	Station Calls 2007	Station Calls 2008
Volusia County								
Station 11 - 1580 Derbyshire Rd.	Holly Hill (Halifax 11)					1,583	1,684	2,303
		Engine						
		Tender						
		Brush Attack						
Station 12 - 1979 Taylor Rd.	Port Orange (Spruce Creek)					716	733	930
		Engine						
		Brush						
		Heavy Rescue						
		Squad						
Station 13 - 15 Southland Rd.	Ormond Beach (Halifax)					649	765	964
		Engine						
		Brush						
		Heavy Rescue						
		Squad						
Station 14 - 1716 Atlantic Ave.	Ormond Beach (North Peninsula)					933	996	1,121
		Engine						
Station 15 - 3889 Tiger Bay Rd.	Daytona Beach (Fire Science Institude)					694	837	843
		Engine						
Station 16 - 3935 Old Dixie Hwy.	Ormond Beach (Halifax Plantation)					251	270	251
		Engine						
Station 18 - 500 Rodeo Dr.	Ormond Beach (Rima Ridge)					0	108	143
		Engine						
Station 21 - 4840 S. Atlantic Dr.	New Smyrna Beach (South Beach)					246	434	394
		Engine						
		Light Rescue						
Station 22 - 213 N. US Hwy. 1	Oak Hill (Oak Hill)					678	599	609
		Engine						
		Tender						
		Brush Attack						
Station 23 - 1850 Pioneer Tr.	New Smyrna Beach (Turnbull)					1,016	1,216	1,264
		Engine						
		Brush						
		Heavy Rescue						
		Squad						
		Tender						
Station 31 - 2850 Firehouse Rd.	Deland (Spring Lake 32)					856	897	919
		Engine						
		Brush						
Station 32 - 1970 S. Volusia Ave.	Orange City					1,195	1,159	1,058
		Engine						
		Tender						
Station 33 - 93 US Hwy. 17-92	Debary (Debary)					1,528	1,513	1,453
		Engine						
		Tender						
Station 34 - 1700 Enterprise/Osteen Rd.	Osteen (Indian Mound)					371	450	439
		Engine						
		Tender						
		Light Rescue						
Station 35 - 630 W. Main St.	Lake Helen (Lake Helen)					903	831	804
		Engine						
		Heavy Rescue						
		Squad						
		Tender						
		Brush Attack						
Station 36 - 180 N. State Rd. 415	Osteen (Osteen)					662	696	596
		Engine						
		Rescue						
		Tender						
		Brush Attack						
Station 37 - 740 Lake Harney Woods Blvd.	Mims (Lake Harney)					45	62	34
		Engine						
		Tender						
		Brush Attack						

Fire Station Information

Station	Location (Station Name)	Apparatus	Unit Responses 2006	Unit Responses 2007	Unit Responses 2008	Station Calls 2006	Station Calls 2007	Station Calls 2008
Station 41 - 5007 Central Ave.	DeLeon Springs (DeLeon Springs)					605	637	535
		Engine						
		Tender						
		Brush						
Station 42 - 1885 Kepler Rd.	Deland (Kepler Ridge)					796	771	778
		Engine						
		Tender						
		Brush Attack						
Station 43 - 1580 US Hwy. 17	Seville (Seville)					175	192	150
		Engine						
		Rescue						
		Tender						
		Brush Attack						
Station 44 - 132 N. Fountain Dr.	Pierson (Pierson)					608	589	525
		Engine						
		Rescue						
		Tender						
		Brush						
Station 45 - 2580 W. SR 44	Deland (St. Johns)					769	779	700
		Engine						
		Tender						
		Brush						
Station 46 - 920 Glenwood Rd.	DeLand (Glenwood)					1,102	1,042	1,184
		Engine						
		Heavy Rescue						
		Squad						
		Total				**18,387**	**19,267**	**20,005**
		Average per Shift				**2.0**	**2.1**	**2.1**
City of Edgewater								
Station 55 - 106 Rhode Island St.								
		Engine			1,478			
		Brush						
		Squad						
Station 57 - 2628 Hibiscus Dr.								
		Engine			1,417			
		Rescue			716			
		Brush						
		Tender						
		Total			**3,611**			
		Average per Shift			**3.3**			
City of New Symrna Beach	**Data Not Provided**							
Station 50 - 103 Faulkner St.								
		Engine						
Station 51 - 151 Williamson Blvd.								
		Engine						
Station 52 - 309 Columbus Ave.								
		Engine						
Station 53 - 1400 N. Dixie Hwy								
		Engine						
City of Holly Hill	**Data Not Provided**							
Station 96 - 1020 Daytona Ave.								
		Engine						
City of Ponce Inlet	**Data Not Provided**							
Station 78 - 4680 S. Peninsula Dr.								
		Engine						
		Attack						
		Rescue						

APPENDIX B
Crash Analysis



EMERGENCY VEHICLE CRASH ANALYSIS 2005-2007

Date	Time	Location	Estimated Property Damage	Vehicle Type	# of Fatalities	# of Injuries	Signalized Intersection	Crash Type	Crash Causation	Emergecy Response
City of Daytona Beach										
6/19/05	1:52	BRENTWOOD DR @ CENTER ST	$3,500	AMBULANCE	0	0	Y	ANGLE	FTYRW	Y
10/8/07	16:02	CR 4009 WILLIAMSON BLVD N @ DUNN AV	$600	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
12/1/06	1:33	CR 4040 MAIN ST @ OCEAN AV N	$800	AMBULANCE	0	0	N	SIDESWIPE	CARELESS	Y
10/1/09	13:00	CR 430 MASON AV @ CR 4017 JIMMY ANN DR	$1,000	FIRE DEPARTMENT	0	0	Y	REAR-END	CARELESS	N
8/30/06	19:01	I-95 @ I-4	$8,000	FIRE DEPARTMENT	0	0	N	RIGHT TURN	CARELESS	Y
10/2/07	9:57	PRIVATE PROPERTY, PARKING LOTS	$1,500	FIRE DEPARTMENT	0	0	N	PARKED VEHICLE	CARELESS	N
5/28/07	15:49	SR 430 MASON AV @ CARSWELL AV	$3,000	AMBULANCE	0	0	Y	REAR-END	CARELESS	Y
11/15/07	15:22	SR 430 MASON AV @ FOREST LN	$700	FIRE DEPARTMENT	0	0	N	ANGLE	FTYRW	Y
7/25/07	8:04	SR 430 MASON AV @ OAKWOOD DR	$1,000	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
8/15/05	15:51	SR 441 PENINSULA DR S @ GRANVILLE CIR	$400	FIRE DEPARTMENT	0	0	N	BACKED INTO	CARELESS	N
2/1/07	21:00	SR 5A NOVA RD N @ MADISON AV	$600	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	Y
1/14/05	10:16	SR 5A NOVA RD S @ SR 400 BEVILLE RD	$2,600	AMBULANCE	0	1	Y	ANGLE	FTYRW	Y
12/1/07	17:00	SR 5A NOVA RD S @ SR 400 BEVILLE RD	$1,400	AMBULANCE	0	0	N	REAR-END	CARELESS	N
3/3/06	16:19	SR A1A ATLANTIC AV N @ SR 430 OAKRIDGE BLVD	$200	FIRE DEPARTMENT	0	0	N	SIDESWIPE	IMPROPER PASSING	N
10/5/06	8:20	US HWY 1 RIDGEWOOD AV S @ WILDER BLVD	$800	AMBULANCE	0	0	Y	RIGHT TURN	CARELESS	Y
11/10/06	14:17	US HWY 92 INTL SPEEDWAY BLVD W @ BEACH ST N	$6,500	FIRE DEPARTMENT	0	0	Y	ANGLE	DISREGARD TRAFFIC SIGNAL	N
6/19/07	16:57	US HWY 92 INTL SPEEDWAY BLVD W @ CAROLINE ST N	$150	AMBULANCE	0	0	N	SIDESWIPE	IMPROPER LANE CHANGE	N
8/24/06	16:42	US HWY 92 INTL SPEEDWAY BLVD W @ FENTRESS BLVD	$100	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
7/28/05	7:47	US HWY 92 INTL SPEEDWAY BLVD W @ INDIAN LAKE RD	$500	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
9/14/07	14:41	US HWY 92 INTL SPEEDWAY BLVD W @ MIDWAY AV	$13,000	FIRE DEPARTMENT	0	2	Y	ANGLE	FTYRW	Y
2/8/06	8:48	US HWY 92 INTL SPEEDWAY BLVD W @ SR 483 CLYDE MORR	$4,000	AMBULANCE	0	3	Y	ANGLE	FTYRW	Y
7/29/06	16:44	US HWY 92 INTL SPEEDWAY BLVD W @ SR 5A NOVA RD S	$10,000	AMBULANCE	0	0	Y	ANGLE	FTYRW	Y

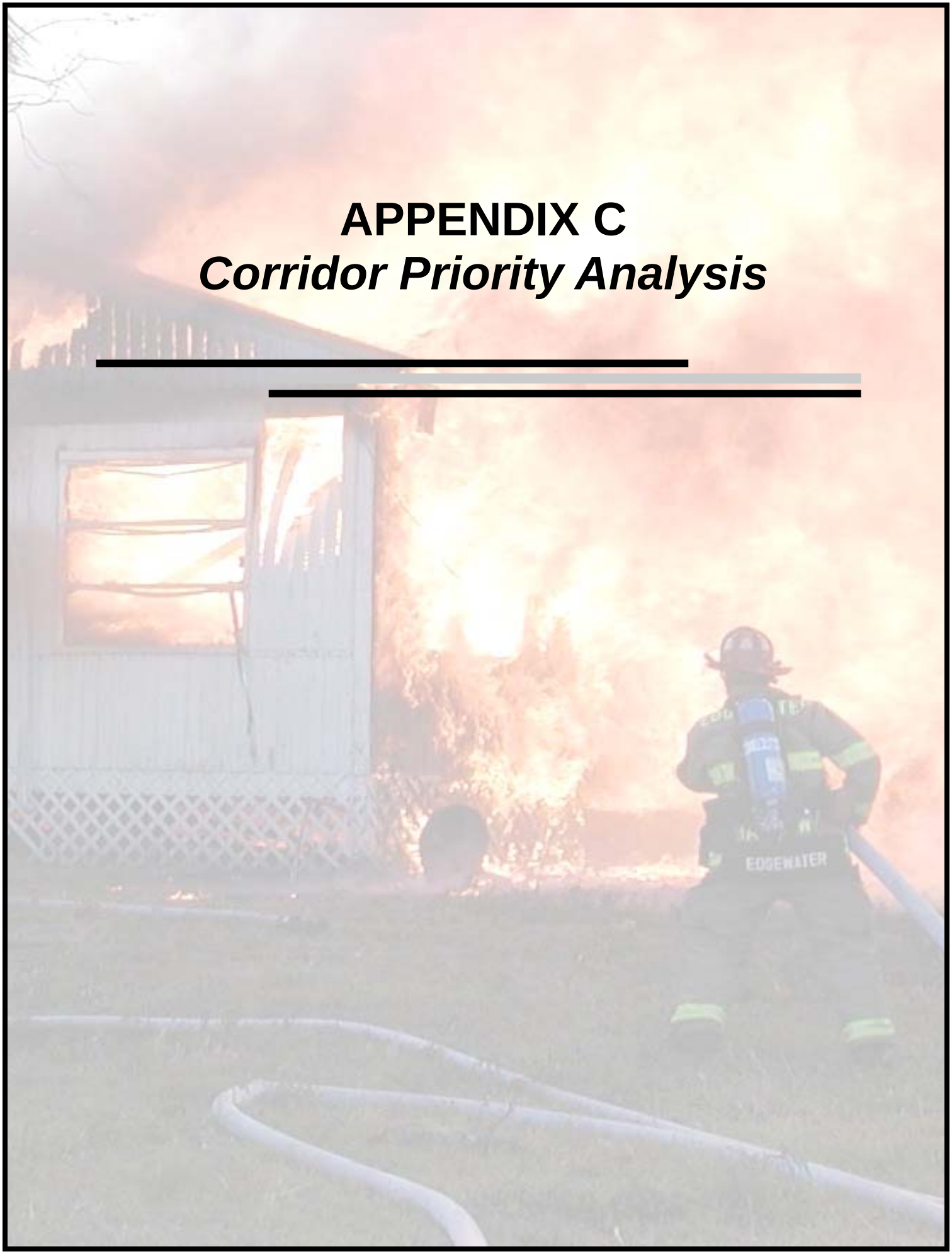
EMERGENCY VEHICLE CRASH ANALYSIS 2005-2007

Date	Time	Location	Estimated Property Damage	Vehicle Type	# of Fatalities	# of Injuries	Signalized Intersection	Crash Type	Crash Causation	Emergecy Response
City of Debary										
11/6/05	1237	US HWY 17-92 CHARLES R BEALL BLVD S @ SIMON DR	$2,400	FIRE DEPARTMENT	0	0	N	SIDESWIPE	FTYRW	Y
City of DeLand										
4/30/07	1814	CR 4101 KEPLER RD N @ SAN ANTONIO ST	$500	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
3/11/05	2004	FLORIDA AV N @ INDIANA AV W	$500	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	Y
7/31/07	251	I-4 INTERCHANGE @ SR 44	$1,500	AMBULANCE	0	0	N	SIDESWIPE	CARELESS	N
8/9/06	1555	SR 44 NEW YORK AV E @ PREVATT AV N	$500	FIRE DEPARTMENT	0	0	Y	REAR-END	CARELESS	N
2/9/05	1645	US HWY 92 INTL SPEEDWAY BLVD E @ US HWY 17 WOODLAN	$200	FIRE DEPARTMENT	0	0	Y	PARKED VEHICLE	CARELESS	Y
City of Deltona										
5/28/05	1803	AARON DR @ PIONEER DR	$1,000	FIRE DEPARTMENT	0	0	N	SIDESWIPE	CARELESS	N
6/30/05	1255	CR 4143 ELKCAM BLVD @ ACADIAN DR W	$0	FIRE DEPARTMENT	0	0	N	SIDESWIPE	CARELESS	N
7/3/05	2050	CR 4143 ELKCAM BLVD @ HIBISCUS CT	$2,000	FIRE DEPARTMENT	0	0	N	REAR-END	FOLLOWING TO CLOSE	Y
2/26/07	1635	CR 4145 GRAVES AV E @ NORMANDY BLVD N	$4,000	AMBULANCE	0	0	Y	RIGHT TURN	IMPROPER TURN	
12/11/07	2134	CR 4145 HOWLAND BLVD @ FOREST EDGE DR	$600	AMBULANCE	0	0	Y	SIDESWIPE	FTYRW	
2/2/06	1543	CR 4146 SAXON BLVD @ APACHE CIR W	$2,000	AMBULANCE	0	1	N	HEAD-ON	FTYRW	
4/27/06	1318	I-4 @ CR 4146 SAXON BLVD	$1,500	AMBULANCE	0	0	N	BACKED INTO	CARELESS	Y
4/12/07	1527	I-4 E @ MILEPOST #130	$500	FIRE DEPARTMENT	0	0	N	SIDESWIPE	CARELESS	Y
8/21/07	1214	TIVOLI DR @ LYDIA DR	$200	FIRE DEPARTMENT	0	0	N	PARKED VEHICLE	OBSTRUCTING TRAFFIC	N
City of Edgewater										
8/20/07	1210	I-95 N @ MILEPOST #239	$250	FIRE DEPARTMENT	0	0	N	SIDESWIPE	CARELESS	Y

EMERGENCY VEHICLE CRASH ANALYSIS 2005-2007

Date	Time	Location	Estimated Property Damage	Vehicle Type	# of Fatalities	# of Injuries	Signalized Intersection	Crash Type	Crash Causation	Emergecy Response
City of Holly Hill										
2/5/05	2335	SELMA AV @ FLOMICH ST	$2,000	AMBULANCE	0	1	Y	SIDESWIPE	FTYRW	Y
6/21/05	1656	SR 5A NOVA RD N @ WALKER ST	$8,000	AMBULANCE	0	0	Y	SIDESWIPE	FTYRW	Y
City of New Smyrna										
9/14/05	1406	CANAL ST @ FAULKNER ST	$1,500	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	N
5/5/05	1606	I-95 INTERCHANGE@ SR 44	$15,000	FIRE DEPARTMENT	0	1	N	REAR-END	CARELESS	N
2/28/05	1524	MAGNOLIA ST @ SMITH ST	$25,000	FIRE DEPARTMENT	0	1	N	ANGLE	DISREGARDED STOP SIGN	N
4/7/06	1421	RIVERSIDE DR S @ DOWNING ST	$250	FIRE DEPARTMENT	0	0	N	BACKED INTO	CARELESS	N
2/15/05	1512	SR 44 @ COATES DR	$2,800	FIRE DEPARTMENT	0	0	Y	REAR-END	CARELESS	N
5/5/07	2225	SR 44 @ WALLACE RD	$500	FIRE DEPARTMENT	0	0	N	REAR-END	CARELESS	Y
2/6/07	2041	SR 44 @ WALLACE RD	$300	AMBULANCE	0	0	Y	BACKED INTO	CARELESS	Y
6/22/07	1540	SR 44 LYTLE AV @ SR A1A LYTLE AV	$8,500	FIRE DEPARTMENT	0	0	N	SIDESWIPE	FTYRW	Y
5/19/07	203	SR A1A CAUSEWAY S @ RICHMOND DR	$3,500	AMBULANCE	1	0	N	PEDESTRIAN	FTYRW	Y
Orange City										
3/9/06	1744	CR 4145 GRAVES AV E @ HOLLY AV N	$5,000	FIRE DEPARTMENT	0	0	Y	RIGHT TURN	CARELESS	N
7/19/05	1405	US HWY 17-92 VOLUSIA AV N @ NEW YORK AV E	$2,200	AMBULANCE	0	1	Y	REAR-END	CARELESS	Y
City of Ormand Beach										
7/11/07	1615	I-95 N @ MILEPOST #274	$3,000	AMBULANCE	0	2	N	REAR-END	FOLLOWING TO CLOSE	N
6/20/05	1300	SR 5/US 1 @ EXT FR I-95 S	$7,500	FIRE DEPARTMENT	0	0	N	SIDESWIPE	FTYRW	Y
City of Port Orange										
11/14/06	1719	PRIVATE PROPERTY, PARKING LOTS	$150	FIRE DEPARTMENT	0	0	N	SIDESWIPE	CARELESS	N
7/1/06	1707	SR 5A NOVA RD @ TREE GARDEN DR	$3,500	AMBULANCE	0	1	Y	SIDESWIPE	FTYRW	N
City of South Daytona										
6/3/05	2028	SR 5A NOVA RD S @ CR 4072 BIG TREE RD	$8,000	AMBULANCE	0	0	Y	RIGHT TURN	FTYRW	Y

APPENDIX C
Corridor Priority Analysis



CORRIDOR PRIORITY ANALYSIS

Segments without signalized intersection not included in analysis. Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
US 92																				
79060	0.000	600	US 17		US 17					39			29			29				
	0.251				Amelia Ave.					39			20			26				
	0.501				Garfield Ave.					16			20			9				
	1.406				Jacobs Rd.					23			14			12				
	2.638			Kepler Rd.	Kepler Rd.	C	3	2.638	5	7	28,500	4.52	5	29,000	3.15	8	31,000	2.81	3.49	52.42
	3.958		Kepler Rd.	Old Daytona Rd.		B	2	1.320	0		16,636			16,800			16,531			
	11.153		Old Daytona Rd.	Red John Dr.		A	1	7.195	0		16,636			16,800			16,531			
	11.595		Red John Dr.		Indian Lake Rd.					2			1			8				
	13.137			I 4		B	2	1.984	1		24,000	0.12		25,000	0.06		24,500	0.45	0.21	0.41
	13.993		I 4	LPGA Blvd.	LPGA Blvd.	B	2	0.856	1	5	24,000	0.67	4	25,000	0.51	8	24,500	1.05	0.74	1.48
	15.609		LPGA Blvd.		Tomoka Farms Rd.					27			41			45				
	16.088			I 95	I-95 NB Exit Ramp	B	2	2.095	2	14	21,500	2.49	7	28,000	2.24	6	29,000	2.30	2.35	9.38
	16.401		I 95		Indigo Dr.					54			47			45				
	16.534				Thames Rd.					40			31			33				
	16.733			Williamson Blvd.	Williamson Blvd.	B	2	0.645	3	95	48,000	16.73	54	48,500	11.56	59	51,500	11.30	13.20	79.17
	17.043		Williamson Blvd.		Kennel Club					3			16			20				
	17.179				Fentress Blvd.					34			25			27				
	17.427				Plaza Entrance					7			13			12				
	17.615				Industrial Parkway					15			11			13				
	17.860			Bill France Blvd.	Bill France Blvd	B	2	1.127	5	37	51,500	4.53	40	49,500	5.16	24	50,000	4.67	4.79	47.85
	18.117		Bill France Blvd.		Midway Blvd.					25			29			14				
	18.405				Hagen Terrace					1			4			0				
	18.716			SR 483	SR 483	B	2	0.856	3	70	42,500	7.23	57	42,500	6.78	58	44,000	5.24	6.41	38.49
	19.254		SR 483		White St.					16			16			13				
	19.376				Seneca Blvd.					15			9			14				
	19.648			SR 5A	SR 5A	B	2	0.932	3	96	45,000	8.30	78	45,000	6.73	59	44,000	5.75	6.92	41.54
	19.911		SR 5A		Adams St.					7			7			7				
	20.276				Lincoln St.					10			17			17				
	20.424			Martin Luther King Blvd.	Martin Luther King Blvd.	B	2	0.776	3	28	33,000	4.81	19	29,000	5.23	17	26,500	5.46	5.17	31.02
	20.766		Martin Luther King Blvd.	US 1	US 1	B	2	0.342	1	61	28,000	17.45	44	28,000	12.59	38	26,000	11.71	13.92	27.83
79080	0.000	600	US 1																	
	0.110				Palmetto Ave.					17			14			17				
	0.230			Beach St.	Beach St.	B	2	0.230	2	29	20,900	26.22	29	17,900	28.62	18	22,500	18.53	24.45	97.82
	1.059		Beach St.		Halifax Dr.					12			5			8				
	1.114			SR 441	SR 441	B	2	0.884	2	15	21,000	3.98	14	16,500	3.57	15	18,500	3.85	3.80	15.21
	1.316		SR 441		Grandview Ave.															
	1.407			SR A1A	SR A1A	B	2	0.293	2	32	12,800	23.38	27	19,600	12.88	22	15,300	13.45	16.57	66.27
TOTAL US 92						**B**	**2**	**22.173**	**33**			**9.26**			**7.62**			**6.66**	**7.85**	**517.94**
SR 44																				
79070	3.103	44	Hazen Rd.																	
	3.862			SR 15A	SR 15A	C	3	0.759	1	30	14,400	7.52	40	14,300	10.10	39	13,600	10.35	9.32	27.97
	4.361		SR 15A	Stone St.	Stone St.	C	3	0.499	1	4	13,400	1.64	2	13,300	0.83	9	12,500	3.95	2.14	6.42
	4.871		Stone St.	Clara Ave.	Clara Ave.	C	3	0.510	1	3	13,100	1.23	6	12,900	2.50	4	12,300	1.75	1.83	5.48
	5.000		Clara Ave.		Florida Ave.					5			5			6				
	5.122				US 17-92					18			10			11				
	5.246				Alabama Ave.					9			1			4				
	5.375			Amelia Ave.	Amelia Ave.	C	3	0.504	4	14	10,600	23.59	23	10,000	21.20	11	9,800	17.75	20.85	250.16
	6.372		Amelia Ave.	Hill Ave.	Hill Ave.	C	3	0.997	1	5	14,700	0.93	6	15,300	1.08	5	13,200	1.04	1.02	3.05
	6.879		Hill Ave.	Blue Lake Ave.	Blue Lake Ave.	D	4	0.507	1	8	13,200	3.28	8	14,600	2.96	13	15,600	4.50	3.58	14.32
	7.817		Blue Lake Ave.	Kepler Rd.	Kepler Rd.	D	4	0.938	1	37	16,400	6.59	20	17,700	3.30	25	15,000	4.87	4.92	19.68
			Kepler Rd.	Summit Ave.	Summit Ave.	D	4	1.23	1	6	16,100	0.83	13	18,000	1.61	6	17,200	0.78	1.07	4.29
			Summit Ave.		I 4 WB Ramps					8			2			5				
				I 4		A	1	0.91	1		16,200	1.49		16,800	0.36		17,200	0.88	0.91	0.91
			I 4		I 4 EB Ramps					7			4			14				
	10.721			Prevatt Rd.	Prevatt Rd.	A	1	0.78	2	12	17,200	3.88	32	14,700	8.60	9	15,300	5.28	5.92	11.84
	16.650		Prevatt Rd.	Pioneer Tr.		A	1	5.929	0		17,200			14,700			15,300			
	20.207		Pioneer Tr.	SR415	SR 415	A	1	3.557	1	3	10,300	0.22	11	9,400	0.90	7	12,200	0.44	0.52	0.52
	21.348		SR 415	Samsula Dr.		A	1	1.141	0		14,200			14,000			14,900			
	25.120		Samsula Dr.	I 95		B	2	3.772	0		14,300			18,200			18,800			
	25.155		I 95		I 95 NB Ramps					0			0			4				
	26.185				Glencoe Rd.					5			8			13				
	27.589				Eddie Rd.					20			13			7				
	27.936				Wallace Rd.					38			39			42				
	28.039			Canal St.		B	2	2.919	4		22,000	2.69		23,000	2.45		25,500	2.43	2.52	20.17
	28.777		Canal St.		Myrtle Ave.					2			6			5				
	29.026			US 1		B	2	0.987	1		18,200	0.31		19,000	0.88		20,200	0.69	0.62	1.25
TOTAL SR 40						**B**	**2**	**25.939**	**20**			**4.17**			**4.37**			**4.21**	**4.25**	**169.90**
SR 400																				
79001	0.283	400	Williamson Blvd.		Williamson Blvd.					25			17			38				
	1.609			Forest Lake Blvd.		B	2	1.326	1		27,500	1.88		28,500	1.23		25,500	3.08	2.06	4.13
	2.194		Forest Lake Blvd.	SR 483	SR 483	B	2	0.585	1	49	27,500	8.34	40	28,500	6.57	51	29,000	8.24	7.72	15.44
	2.658		SR 483		Bellenova Shopping Center					6			16			10				
	2.871			Nova Rd.	Nova Rd.	C	3	0.677	2	98	35,000	12.02	85	34,500	11.85	74	34,000	10.00	11.29	67.74
	3.221		Nova Rd.		Magnolia Ave.					3			7			2				
	3.864				Golfview Blvd.					6			2			5				
	4.216			US 1	US 1	B	2	1.345	3	21	28,500	2.14	26	26,000	2.74	23	25,000	2.44	2.44	14.66
TOTAL SR 400						**B**	**2**	**3.933**	**7**			**6.10**			**5.60**			**5.94**	**5.88**	**82.30**

CORRIDOR PRIORITY ANALYSIS

Segments without signalized intersection not included in analysis. Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
US 1																				
79030	12.803	5	Flagler County Line																	
	11.450				Destination Daytona					5			7			25				
	11.252				I 95 SB Ramps					26			4			7				
	11.116			I 95		A	1	1.687	2		17,100	2.94		18,300	0.98		19,900	2.61	2.18	4.35
	11.066		I 95		I 95 NB Ramps					12			9			6				
	8.453			Airport Rd.	Airport Rd.	B	2	2.663	2	18	22,500	1.37	21	23,000	1.34	26	23,000	1.43	1.38	5.53
	7.336		Airport Rd.	Nova Rd.	Nova Rd.	C	3	1.117	1	24	34,500	1.71	34	30,000	2.78	22	31,000	1.74	2.08	6.23
	6.223		Nova Rd.		Wilmette Ave.					10			11			17				
	5.509			SR 40	SR 40	B	2	1.827	2	64	19,600	5.66	66	19,800	5.83	49	18,800	5.26	5.59	22.34
	4.911		SR 40		Division Ave.					10			9			18				
	4.666			Hand Ave.	Hand Ave.	B	2	0.843	2	22	26,500	3.92	13	27,000	2.65	13	25,000	4.03	3.53	14.14
	3.849		Hand Ave.		Calle Grande St.					13			13			7				
	3.400				Flomich Ave.					21			24			14				
	2.913				Walker St.					16			15			5				
	2.664				LPGA Blvd.					24			12			12				
	2.167				8th St.					8			6			3				
	1.916			6th St.	6th St.	B	2	2.750	6	7	29,000	3.06	10	28,500	2.80	5	28,500	1.61	2.49	29.85
	1.567		6th St.		3rd St.					10			7			8				
	1.390				2nd St.					11			12			16				
	1.192			SR 430	SR 430	B	2	0.724	3	57	28,500	10.36	43	28,500	8.23	43	28,500	8.90		
	0.963		SR 430		Madison Ave.					28			18			10				
	0.664			Fairview Ave.	Fairview Ave.	C	3	0.528	2	13	28,500	7.46	12	30,000	5.19	18	30,000	4.84	5.83	34.99
	0.544		Fairview Ave.		Mullally St.					3			10			13				
	0.356				Dr. Mary McLeod Bethune Blvd.					18			7			21				
	0.144				Bay St.					13			20			12				
	0.000			US 92	US 92	C	3	0.664	4	61	32,000	12.25	44	32,500	10.28	38	29,500	11.75	11.43	137.13
79010	32.696	5	US 92																	
	32.540				Magnolia Ave.					12			9			8				
	32.394			Orange Ave.	Orange Ave.	C	3	0.302	2	30	35,000	10.89	24	32,000	9.36	22	30,000	9.07	9.77	58.63
	31.669		Orange Ave.	Bellevue Ave.	Bellevue Ave.	C	3	0.725	1	18	35,500	1.92	21	32,500	2.44	21	30,500	2.60	2.32	6.96
	31.010		Bellevue Ave.		Wilder Blvd.					18			12			13				
	30.623			Beville Rd.	Beville Rd.	C	3	1.046	2	21	39,000	2.62	26	33,500	2.97	23	34,000	2.77	2.79	16.73
	30.422		Beville Rd.	Bellewood Ave.	Ferndale Ave.	C	3	0.201	1	1	35,000	0.39	5	33,000	2.07	2	30,500	0.89	1.12	3.35
	29.908		Bellewood Ave.	Big Tree Rd.	Big Tree Rd.	C	3	0.514	1	22	34,000	3.45	24	31,500	4.06	18	29,500	3.25	3.59	10.76
	29.402		Big Tree Rd.		Ridge Blvd.					16			21			10				
	28.740			Reed Canal Rd.	Reed Canal Rd.	C	3	1.168	2	2	35,500	1.19	1	33,000	1.56	1	30,000	0.86	1.20	7.23
	28.371		Reed Canal Rd.		Venture Dr.					11			12			10				
	27.704				Herbert St.					10			13			10				
	27.560			SR 421	SR 421	C	3	1.180	3	29	33,500	3.47	21	29,500	3.62	33	31,000	3.97	3.69	33.17
	27.375		SR 421		Meeker Pl.					1			1			1				
	27.248			Oak St.		B	2	0.312	1		24,500	0.36		23,500	0.37		22,500	0.39	0.37	0.75
	26.186		Oak St.		Commonwealth Blvd.					9			6			2				
	24.954			Nova Rd.	Nova Rd.	B	2	2.294	2	14	21,000	1.31	17	20,500	1.34	4	17,000	0.42	1.02	4.09
	21.762		Nova Rd.	Art Center Ave.		B	2	3.192	0		22,500			23,500			22,000			
	19.519		Art Center Ave.	Turnbull Bay Rd.	Turnbull Bay Rd.	B	2	2.243	1	12	26,000	0.56	14	29,000	0.59	11	24,500	0.55	0.57	1.13
	18.954		Turnbull Bay Rd.		Wayne Ave.					13			14			11				
	18.343				Washington Ave.					22			9			11				
	18.176			Canal St.	Canal St.	B	2	1.343	3	39	31,000	4.87	23	30,000	3.13	17	28,000	2.84	3.61	21.68
	17.969		Canal St.		Lytie Ave.					14			10			16				
	16.655				10th St.					9			14			13				
	15.652			Park Ave.	Park Ave.	B	2	2.524	3	8	28,500	1.18	5	28,000	1.12	5	27,000	1.37	1.22	7.34
	14.871		Park Ave.	Turgot Ave.		B	2	0.781	0		32,000			32,500			29,000			
	14.166		Turgot Ave.	SR 442	SR 442	B	2	0.705	1	19	31,500	2.34	14	31,500	1.73	15	29,000	2.01	2.03	4.05
	13.643		SR 442		Falcon Ave.					4			8			4				
	12.290				Roberts Rd.					10			14			11				
	11.911			Volco Rd.		B	2	2.255	2		22,500	0.76		22,500	1.19		25,000	0.73	0.89	3.56
	8.210		Volco Rd.	HH Birch Rd.		B	2	3.701	0		13,094			12,980			12,672			
	6.164		HH Birch Rd.	Halifax Ave.		B	2	2.046	0		3,700			12,980			12,672			
	3.970		Halifax Ave.	Kennedy Pkwy.		A	1	2.194	0		3,700			3,700			4,000			
TOTAL US 1						**B**	**2**	**41.529**	**49**			**3.65**			**3.29**			**3.21**	**3.38**	**331.73**
SR 40																				
79100	0.855	40	Emporia Rd.																	
	6.427			US 17	US 17	C	3	5.572	1	7	6,900	0.50	2	7,500	0.13	3	8,300	0.18	0.27	0.81
	13.117		US 17	Stone St.	SR 11					8			5			4				
	19.941			Pinto Ln.		B	2	13.514	1		5,600	0.29		5,800	0.17		6,000	0.14	0.20	0.40
	24.523		Pinto Ln.		Breakaway Tr.					5			7			9				
	25.492			Tymber Creek Rd.	Tymber Creek Rd.	B	2	5.551	2	16	13,000	0.80	12	13,500	0.69	10	11,200	0.84	0.78	3.11
	26.022		Tymber Creek Rd.		Booth Rd.					5			4			3				
	26.286				I 95 SB Ramps					5			3			5				
	26.334			I 95		B	2	0.842	2		28,500	1.14		28,000	0.81		28,500	0.91	0.96	3.82
	26.351		I 95		I 95 NB Ramps					9			4			5				
	26.504				Williamson Blvd.					35			39			24				
	27.002				Seminole Dr.					20			13			12				
	27.866			Clyde Morris Blvd.	Clyde Morris Blvd.	F	6	1.532	4	30	38,500	4.37	20	36,500	3.72	23	38,000	3.01	3.70	88.82
	28.192		Clyde Morris Blvd.		Old Tomoka Rd.					16			16			12				
	28.908			SR 5A	SR 5A	F	6	1.042	2	43	37,000	4.19	44	36,000	4.38	49	36,000	4.46	4.34	52.12
	29.799		SR 5A		Orchard St.					21			27			24				
	30.317			US 1	US 1	C	3	1.409	2	30	31,500	3.15	33	33,000	3.54	30	32,500	3.23	3.30	19.83
TOTAL SR 40						**C**	**3**	**29.462**	**14**			**2.06**			**1.92**			**1.82**	**1.94**	**81.30**

CORRIDOR PRIORITY ANALYSIS

Segments without signalized intersection not included in analysis. Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
SR A1A																				
79080	16.726	A1A	Flagler County Line																	
	10.620			Kathy Dr.		D	4	6.106	0		10,500			16,300			17,100			
	9.017		Kathy Dr.		Publix Entrance					0			0			1				
	7.978			Ocean Terrace		D	4	2.642	1		17,600	0.00		16,500	0.00		16,600	0.06	0.02	0.08
	7.357		Ocean Terrace		Neptune Ave.					1			1			2				
	6.662			SR 40	SR 40	D	4	1.316	2	27	17,400	3.35	16	18,400	1.92	27	18,100	3.34	2.87	22.96
	5.974		SR 40		Fire Station					0			0			0				
	5.414				Cardinal Dr.					11			4			5				
	4.962				Harvard Dr.					12			4			4				
	4.618			Plaza Blvd.	Plaza Blvd.	B	2	2.044	4	13	19,700	2.45	9	19,100	1.19	6	19,800	1.02	1.55	12.42
	4.432		Plaza Blvd.		Bellair Plaza					2			5			4				
	4.181				Williams Ave.					2			2			3				
	3.702				Seaview Ave.					2			2			2				
	3.207				Driftwood Ave					5			4			3				
	2.930				University Blvd					12			10			8				
	2.433			SR 430	SR 430	B	2	2.185	6	27	21,000	2.99	31	20,000	3.39	28	24,000	2.51	2.96	35.51
	2.309		SR 430	Oakridge Blvd.	Oakridge Blvd.	B	2	0.124	1	8	17,700	9.99	22	16,700	29.11	11	24,300	10.00	16.36	32.73
	2.122		Oakridge Blvd		Ora St.					9			21			14				
	2.003				Earl St.					12			11			9				
	1.884				Auditorium Blvd.					6			14			9				
	1.767				Main St.					16			13			5				
	1.649				Harvey Rd.					12			9			5				
	1.407			US 92	US 92	B	2	0.902	6	32	16,000	16.52	27	15,400	18.74	22	21,500	9.04	14.76	177.18
79180	6.615		US 92																	
	5.922			Silver Beach Ave.	Silver Beach Ave.	B	2	0.693	1	7	14,600	1.90	4	13,300	1.19	5	15,400	1.28	1.46	2.91
	5.194		Silver Beach Ave.		Botefuhr Ave.					3			3			5				
	4.664				Moore Ave.					9			3			1				
	3.171			Thames Ave.		B	2	2.751	2		16,000	0.75		19,500	0.31		18,900	0.32	0.46	1.83
	2.388		Thames Ave.		Emergency Signal					0			0			0				
	1.647			Simpson Ave.		B	2	1.524	1		15,600	0.00		13,900	0.00		14,900	0.00	0.00	0.00
	1.246		Simpson Ave.	Dunlawton Ave.	Dunlawton Ave.	B	2	0.401	1	7	17,400	2.75	12	18,800	4.36	2	13,000	1.05	2.72	5.44
	1.085		Atlantic Ave.		Peninsula Dr.					11			11			5				
	0.000			US 1	US 1	C	3	1.246	2	29	28,500	3.09	21	29,000	2.43	33	29,500	2.83	2.78	16.69
TOTAL SR A1A						**B**	**2**	**21.934**	**27**			**3.98**			**5.69**			**2.86**	**4.18**	**225.56**
SR 5A																				
79190	15.606	5A	US 1		US 1					24			34			22				
	14.610			Wilmette Ave.	Wilmette Ave.	B	2	0.996	2	14	11,800	8.86	16	15,900	8.65	9	14,700	5.80	7.77	31.08
	14.101		Wilmette Ave.	SR 40	SR 40	B	2	0.509	1	43	21,500	10.77	44	24,500	9.67	49	26,000	10.14	10.19	20.38
	13.874		SR 40		Emergency Signal					0			0			0				
	13.781				Woodlands Blvd.					9			9			10				
	13.199				Division Ave.					2			6			6				
	12.952			Hand Ave.	Hand Ave.	B	2	1.149	4	23	23,500	3.45	31	29,000	3.78	22	29,500	3.07	3.43	27.48
	12.706		Hand Ave.		Fleming Ave.					10			14			16				
	12.202				Golf Ave.					9			9			9				
	11.696				Flomich Ave.					17			16			21				
	11.425				15th St.					9			13			3				
	11.151				Walker St.					13			10			14				
	10.891			LPGA Blvd.	LPGA Blvd.	B	2	2.061	6	31	32,500	3.64	30	31,000	3.95	32	31,000	4.07	3.89	46.64
	10.389		LPGA Blvd.		8th St.					10			7			8				
	10.142			6th St.	6th St.	B	2	0.749	2	19	32,500	3.26	10	31,500	1.97	11	31,000	2.24	2.49	9.97
	9.791		6th St.		3rd St.					10			16			10				
	9.619				Brentwood Dr.					23			24			22				
	9.423			SR 430	SR 430	B	2	0.719	3	48	34,500	8.95	75	34,000	12.89	68	33,000	11.55	11.13	66.76
	9.205		SR 430		Madison Ave.					10			10			15				
	8.785				George W. Engram Blvd.					25			30			30				
	8.481				Mary McLeod Bethune Blvd.					36			23			28				
	8.201			US 92	US 92	B	2	1.222	4	96	36,000	10.40	78	35,000	9.03	59	35,000	8.46	9.30	74.37
	7.940		US 92		Orange Ave.					28			30			34				
	7.130			Bellevue Ave.	Bellevue Ave.	B	2	1.071	2	29	41,000	3.56	45	38,500	4.98	34	38,000	4.58	4.37	17.49
	6.127		Bellevue Ave.	Beville Rd.	Beville Rd.	B	2	1.003	1	98	40,000	6.69	85	39,000	5.95	74	38,000	5.32	5.99	11.98
	5.917		Beville Rd.	June Terrace		B	2	0.210	0		30,000			30,000			28,500			
	5.429		June Terrace		Big Tree Rd.					29			33			31				
	4.576				Reed Canal Rd.					14			19			23				
	3.822			Madeline Ave.	Madeline Ave.	B	2	2.095	3	9	30,000	2.27	5	30,000	2.48	4	28,500	2.66	2.47	14.83
	3.307		Madeline Ave.	Herbert St.	Herbert St.	B	2	0.515	1	7	25,000	1.49	17	26,000	3.48	18	26,000	3.68	2.88	5.77
	2.521		Herbert St.	SR 421	SR421	B	2	0.786	1	35	25,000	4.88	39	26,000	5.23	24	26,000	3.22	4.44	8.88
	2.299		SR 421		Village Tr.					7			12			9				
	1.437			Spruce Creek Rd.	Spruce Creek Rd.	B	2	1.084	2	15	23,500	2.37	27	25,500	3.87	10	24,500	1.96	2.73	10.92
	0.000		Spruce Creek Rd.	US 1	US 1	B	2	1.437	1	17	16,400	1.98	17	17,400	1.86	4	16,900	0.45	1.43	2.86
TOTAL SR 5A						**B**	**2**	**15.606**	**33**			**5.18**			**5.56**			**4.80**	**5.18**	**341.87**
SR 15A																				
79160	6.899	15	US 17																	
	5.787			Glenwood Rd.	Glenwood Rd.	B	2	1.112	1	4	11,600	0.85	3	10,900	0.68	2	11,400	0.43	0.65	1.31
	4.591		Glenwood Rd.	CR 92	CR 92	B	2	1.196	1	3	15,000	0.46	12	13,700	2.01	8	15,100	1.21	1.23	2.45
	3.766		CR 92	Plymouth Ave.	Plymouth Ave.	B	2	0.825	1	24	24,000	3.32	9	23,000	1.30	15	23,500	2.12	2.25	4.49
	3.262		Plymouth Ave.		Minnesota Ave.					9			13			7				
	2.759			SR 44	SR 44	B	2	1.007	2	30	26,000	4.08	40	27,000	5.34	39	26,000	4.81	4.75	18.98
	2.266		SR 44		Euclid Ave.					12			20			8				
	1.759			Beresford Ave.	Beresford Ave.	B	2	1.000	2	4	25,500	1.72	3	24,500	2.57	11	24,500	2.12	2.14	8.55
	0.000		Beresford Ave.	US 17-92	US 17-92	B	2	1.759	1	28	22,000	1.98	45	22,500	3.12	40	22,000	2.83	2.64	5.29
SR 15A						**B**	**2**	**6.899**	**8**			**2.07**			**2.50**			**2.26**	**2.28**	**36.41**

CORRIDOR PRIORITY ANALYSIS

Segments without signalized intersection not included in analysis. | Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
SR 483																				
			SR 40		SR 40					30			20			23				
				S. Forty Tr.		C	3	0.130	1		16,050	39.39		16,380	25.73		18,450	26.27	30.47	91.40
			S. Forty Tr.	Falls Way Blvd.		C	3	0.230	0		15,750			15,960			18,090			
			Falls Way Blvd.	Coquina Point Dr.		F	6	0.270	0		14,750			15,110			16,900			
			Coquina Point Dr.	Hand Ave.	Hand Ave.	F	6	0.110	1	16	14,790	26.94	16	15,130	26.34	22	16,910	32.40	28.56	171.37
			Hand Ave.	Flomich St.	Strickland Range Rd.	F	6	1.720	1	5	14,840	0.54	2	14,720	0.22	4	16,210	0.39	0.38	2.29
			Flomich St.	LPGA Blvd.	LPGA Blvd.	F	6	0.750	1	20	15,090	4.84	20	15,640	4.67	24	17,500	5.01	4.84	29.05
			LPGA Blvd.	Bill France Blvd.	Bill France Blvd.	C	3	1.240	1	4	15,430	0.57	3	15,920	0.42	3	17,890	0.37	0.45	1.36
			Bill France Blvd.	Jimmy Ann Dr.	Jimmy Ann Dr.	C	3	0.220	1	7	13,440	6.49	5	13,750	4.53	3	15,330	2.44	4.48	13.45
			Jimmy Ann Dr.	midblock		C	3	0.270	0		14,200			14,470	0.00		16,020			
			midblock	SR 430	SR 430	C	3	0.270	1	22	14,470	15.43	25	14,390	17.63	24	16,700	14.58	15.88	47.64
79270	3.377	483	SR 430																	
	2.812				Dunn Ave.					27			21			19				
	2.555				Mayberry Ave.					4			7			3				
	2.402				Hospital Entrance					1			2			2				
	2.179			US 92	US 92	B	2	1.198	4	70	22,000	10.60	57	20,500	9.71	58	20,500	9.15	9.82	78.55
	1.770		US 92		Richard Petty Blvd.					22			15			8				
	1.475				Embry Riddle					5			5			6				
	0.984				Bellvue Ave.					25			26			9				
	0.697				Bellvue Ave. Ext.					14			11			10				
	0.000			Beville Rd.	Beville Rd.	C	3	2.179	5	49	34,000	4.25	40	34,000	3.59	51	32,000	3.30	3.71	55.70
			Beville Rd.	Georgetowne Blvd.		D	4	0.590	0		25,670			25,470			28,340			
			Georgetowne Blvd.	Big Tree Rd.	Big Tree Rd.	D	4	0.450	1	14	25,210	3.38	13	14,980	5.28	20	27,580	4.41	4.36	17.44
			Big Tree Ave.		Reed Canal Rd.					8			9			3				
				Madeline St.	Madeline St.	D	4	0.960	2	7	25,290	1.69	11	25,040	2.28	6	27,880	0.92	1.63	13.05
			Madeline St.	Herbert St.	Herbert St.	D	4	1.120	1	10	24,300	1.01	8	24,240	0.81	7	26,710	0.64	0.82	3.27
			Herbert St.	Willow Run Blvd.	Willow Run Blvd.	D	4	0.280	1	6	24,800	2.37	9	24,690	3.57	6	27,290	2.15	2.70	10.78
			Willow Run Blvd.	SR 421	SR 421	D	4	0.630	1	7	22,890	1.33	11	22,760	2.10	5	24,710	0.88	1.44	5.75
			SR 421	Victoria Gardens Blvd.		D	4	0.370	0		11,490			11,330			12,620			
TOTAL SR 483						**C**	**3**	**12.987**	**22**			**8.49**			**7.12**			**7.35**	**7.65**	**505.21**
US 17-92																				
79040	15.172	15/600	SR 92																	
	14.345			Plymouth Ave.	Plymouth Ave	B	2	0.827	1	18	26,500	2.25	16	26,000	2.04	17	25,000	2.25	2.18	4.36
	14.087		Plymouth Ave.		Pennsylvania Ave.					14			6			4				
	13.838				Minnesota Ave.					3			11			5				
	13.581				Wisconsin Ave.					5			11			5				
	13.456				Rich Ave.					10			14			10				
	13.393				Indiana Ave.					2			1			2				
	13.331			SR 44	SR 44	F	6	1.014	6	18	19,300	7.28	10	19,500	7.34	11	18,000	5.55	6.73	242.13
	13.207		SR 44		Howry Ave.					5			11			5				
	13.086				Voorhis Ave.					18			23			10				
	12.840			Euclid Ave.		E	5	0.491	2		17,400	7.38		18,200	10.42		16,400	5.10	7.63	76.34
	12.345		Euclid Ave.	Beresford Ave.	Beresford Ave.	F	6	0.495	1	29	19,500	8.23	29	20,000	8.03	26	17,900	8.04	8.10	48.59
	11.829		Beresford Ave.		New Hampshire Ave.					15			17			11				
	11.322			SR 15A	SR 15A	C	3	1.023	2	28	33,500	3.44	45	32,000	5.19	40	33,000	4.14	4.26	25.53
	10.291		SR 15A		Orange Camp Rd.					46			43			39				
	10.020				Firehouse Rd.					33			26			34				
	9.690			SR 472		F	6	1.632	2		51,500	2.58		50,000	2.32		49,500	2.48	2.46	29.47
	9.282		SR 472		Minnesota Ave.					20			8			11				
	8.828				New York Ave.					9			11			11				
	8.082			French Ave.	French Ave.	C	3	1.608	3	20	33,500	2.49	22	33,500	2.09	22	30,000	2.50	2.36	21.23
	7.832		French Ave.	Graves Ave.	Graves Ave.	C	3	0.250	1	11	35,000	3.44	10	33,000	3.32	7	32,000	2.40	3.05	9.16
	7.447		Graves Ave.	Blue Springs Ave.	Blue Springs Ave.	C	3	0.385	1	24	35,000	4.88	23	33,500	4.89	22	32,500	4.82	4.86	14.58
	7.198		Blue Springs Ave.		Ohio Ave.					9			7			6				
	6.826				Rhode Island Ave.					16			14			12				
	6.075			Enterprise Rd.	Enterprise Rd.	F	6	1.372	3	14	36,000	2.16	17	36,500	2.08	17	36,000	1.94	2.06	37.10
	5.277		Enterprise Rd.		Saxon Blvd.					17			20			9				
	4.666				Debary Plantation Blvd.					5			11			3				
	4.231				Dogwood Tr.					3			2			4				
	3.749			Highbanks Rd.	Highbanks Rd.	B	2	2.326	4	12	30,500	1.43	19	30,500	2.01	15	28,500	1.28	1.57	12.58
	2.687		Highbanks Rd.	Plantation Rd.		B	2	1.062	0		21,000			22,500			21,500			
	1.980		Plantation Rd.	Dirksen Dr.	Dirksen Dr.	B	2	0.707	1	12	21,000	2.21	10	22,500	1.72	6	21,500	1.08	1.67	3.35
TOTAL US 17-92						**C**	**3**	**13.192**	**27**			**3.98**			**4.29**			**3.47**	**3.91**	**316.78**
LPGA BOULEVARD																				
			Tournament Dr.																	
				I 95	I-95 SB Exit Ramp	D	4	1.39	1	0	9,520	0.00	2	9,690	0.41	2	10,430	0.38	0.26	1.05
			I 95		I 95 NB Exit Ramp					3			1			2				
				Williamson Blvd	Williamson Blvd.	D	4	0.62	2	37	24,740	7.14	25	25,210	4.56	23	25,230	4.38	5.36	42.88
			Williamson Blvd.	SR 483	SR 483	D	4	0.48	1	20	21,700	5.26	20	21,930	5.21	24	21,750	6.30	5.59	22.35
			SR 483	Midpoint		C	3	0.55	0		16,510			16,810			16,090			
			Midpoint	Jimmy Ann Dr.		C	3	0.55	0		16,530			16,800			19,480			
			Jimmy Ann Dr.	Kilgore St.		F	6	0.18	0		19,310			19,730			18,680			
			Kilgore St.	Derbyshire Rd.	Derbyshire Rd.	F	6	0.08	1	7	19,140	12.52	15	19,070	26.94	19	18,500	35.17	24.88	149.27
			Derbyshire Rd.	Old Kings Rd.		E	5	0.25	0		15,020			14,890			14,640			
			Old Kings Rd.	SR 5A	SR 5A	D	4	0.31	1	31	14,340	19.11	30	14,290	18.55	32	13,700	20.64	19.43	77.74
			SR 5A	Center Ave.	Center Ave.	D	4	0.51	1	10	11,750	4.57	6	11,690	2.76	7	10,920	3.44	3.59	14.36
			Center Ave.	US 1	US 1	C	3	0.57	1	24	8,310	13.88	12	8,310	6.94	12	8,080	7.14	9.32	27.96
LPGA BOULEVARD						**D**	**4**	**5.49**	**8**			**8.93**			**9.34**			**11.06**	**9.78**	**312.84**

CORRIDOR PRIORITY ANALYSIS

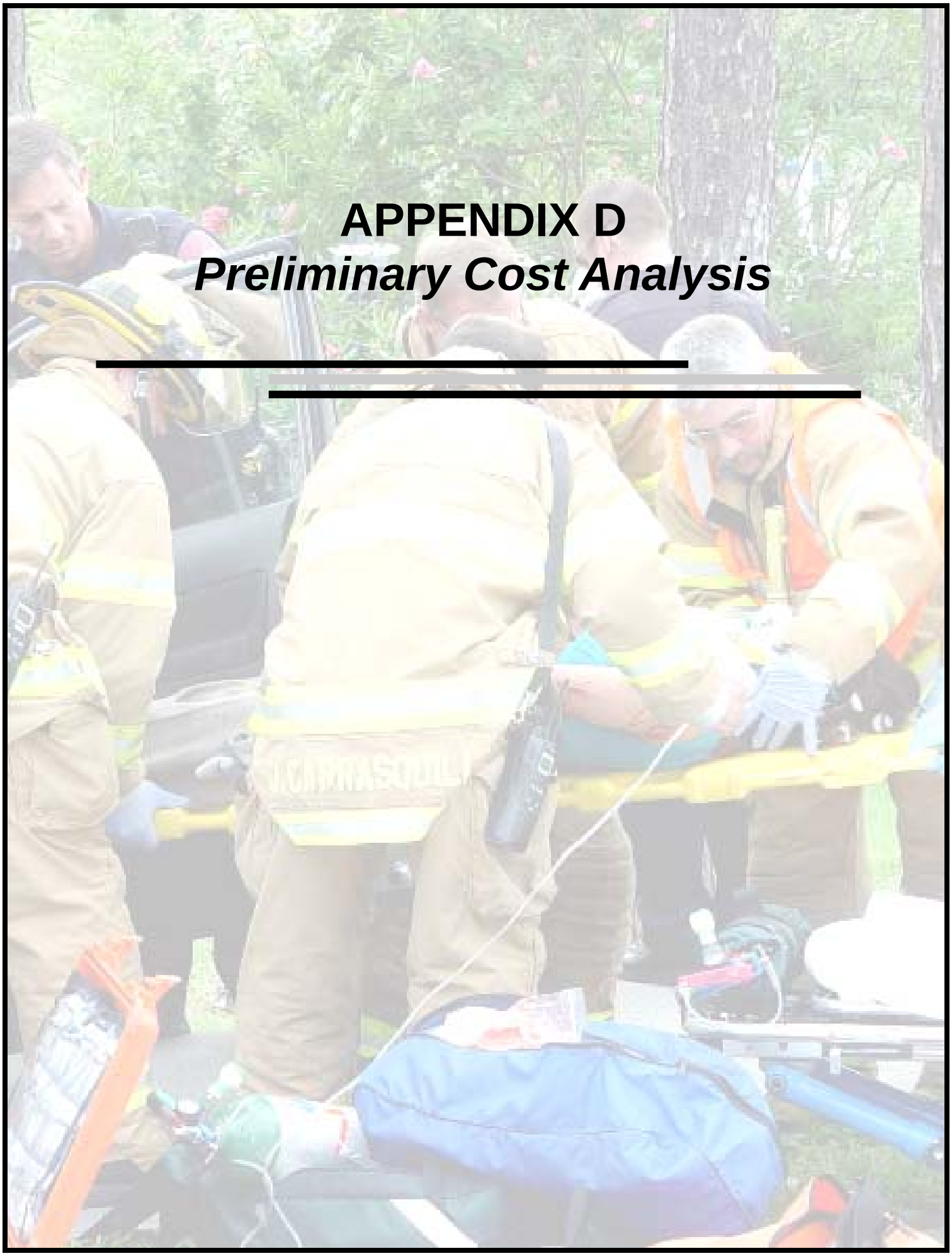
Segments without signalized intersection not included in analysis. Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
US 17																				
79050	25.873	15	Putnam County Line																	
	22.466			CR 305	CR 305	C	1	3.407	1	2	5,600	0.29	0	7,500	0.00	2	8,300	0.19	0.16	0.16
	17.213		CR 305	Washington Ave.	Washington Ave.	B	1	5.253	1	1	5,300	0.10	3	7,500	0.21	1	8,300	0.06	0.12	0.12
	12.183		Washington Ave.	SR 40	SR 40	B	1	5.030	3	7	7,100	0.54	2	13,500	0.08	3	11,200	0.15	0.25	0.76
	7.250		SR 40	Lake Winona Rd.		D	4	4.933	0		8,500			7,500			8,300			
	6.690		Lake Winona Rd.	Spring Garden Ranch Rd.		C	3	0.560	0		8,500			7,500			8,300			
	5.791		Spring Garden Ranch Rd.	Ponce De Leon Blvd.		C	3	0.899	0		12,100			28,000			28,500			
	2.824		Ponce De Leon Blvd.	SR 15A	SR 15A	A	1	2.967	1	21	19,200	1.01	17	7,500	2.09	13	8,300	1.45	1.52	1.52
	1.198		SR 15	Glenwood Rd.	Glenwood Rd.	B	2	1.626	1	17	16,600	1.73	15	7,500	3.37	13	8,300	2.64	2.58	5.16
	0.682		Glenwood Rd.	Mercers Fernery Rd.		B	2	0.516	0		24,500			7,500			8,300			
	0.426		Mercers Fernery Rd.	Clyde Morris Blvd.	Violetwood Rd.					22			16			13				
	0.000			US 92	US 92	C	3	0.682	2	39	30,500	8.03	29	7,500	24.10	29	8,300	20.33	17.49	104.93
TOTAL US 17						**B**	**2**	**25.873**	**9**			**1.95**			**4.98**			**4.14**	**3.69**	**66.36**
SR 430																				
79220	0.000	15	SR 483																	
	0.432				Derbyshire Rd.					1			2			1				
	0.539				White St.					8			11			6				
	0.748				Vine St.					8			4			3				
	0.990				SR 5A					48			75			68				
	1.505				Center St.					12			11			6				
	1.953				Carswell Ave.					3			2			2				
	2.069				US 1					57			43			43				
	2.370			Beach St.	Beach St.	B	2	2.370	8	1	21,000	7.60	1	19,600	8.79	5	20,300	7.63	8.01	128.08
79220001	0.000		Beach St.																	
	0.109			West End of Bridge (EB Lane)		B	2	0.109	0		10,500			9,600			9,800			
	0.620		West End of Bridge (EB Lane)	Halifax Ave.	Halifax Ave.	B	2	0.511	1	13	6,900	10.10	13	6,700	10.40	8	6,400	6.70	9.07	18.14
	0.703		Halifax Ave.		Peninsula Dr.					7			15			7				
	0.983			SR A1A	SR A1A	B	2	0.363	2	8	5,300	21.36	22	4,600	60.71	11	5,300	25.63	35.90	143.60
79220002	0.000		SR A1A		SR A1A					27			31			29				
	0.067				Grandview Ave.					28			17			19				
	0.134				Wild Olive Ave.					20			8			15				
	0.217				Oleander Ave.					8			9			11				
	0.285				Peninsula Dr.					12			11			9				
	0.367			Halifax Ave.	Halifax Ave.	B	2	0.367	6	24	6,200	143.28	20	4,800	149.30	15	5,900	124.00	138.86	1666.34
	0.894		Halifax Ave.	West End of Bridge (WB Lane)		B	2	0.527	0		7,500			7,800			7,300			
SR 430						**B**	**2**	**4.247**	**17**			**45.59**			**57.30**			**40.99**	**47.96**	**1630.61**
SR 421																				
			Tomoka Farms Rd.		Tomoka Farms Rd.					6			10			5				
				Spruce Creek Blvd.		C	3	0.680	1		8,390	2.88		8,670	4.65		8,520	2.36	3.30	9.89
			Spruce Creed Blvd.	Fern Park Dr.		D	4	1.250	0		12,400			12,770			12,460			
			Fern Park Dr.	Summer Trees Rd.		F	6	0.730	0		18,890			19,390			18,660			
			Summer Tree Rd.	Williamson Blvd.	Williamson Blvd.	F	6	0.210	1	48	20,590	30.41	52	20,960	32.37	26	20,330	16.68	26.49	158.93
			Williamson Blvd.		I 95 SB Ramps					3			1			7				
				I 95		F	6	0.180	1		37,390	1.22		38,740	0.39		37,180	2.87	1.49	8.96
79230	0.237	421	I 95																	
	0.424				Taylor Rd.					17			28			20				
	0.730				Yorktowne Blvd.					9			9			12				
	1.068			SR 483	SR 483	B	2	0.831	3	32	37,500	5.10	44	35,000	7.63	27	36,500	5.33	6.02	36.12
	1.472		SR 483		Victoria Gardens Blvd.					11			12			21				
	1.880				Swallow Tail Dr.					9			18			12				
	2.382			SR 5A	SR 5A	B	2	1.314	3	35	31,500	3.64	39	29,500	4.88	24	33,500	3.55	4.02	24.13
	3.292		SR 5A	Spruce Creek Rd.	Spruce Creek Rd.	B	2	0.910	1	18	28,500	1.90	15	32,000	1.41	14	28,000	1.51	1.61	3.21
	4.001		Spruce Creek Rd.	US 1	US 1	B	2	0.709	1	29	25,500	4.39	21	29,000	2.80	33	26,000	4.90	4.03	8.06
SR 421						**C**	**3**	**6.814**	**11**			**7.08**			**7.73**			**5.31**	**6.71**	**221.38**
SAXON BOULEVARD																				
			US 17-92		US 17-92					17			20			9				
				Market Place Shopping Center	Market Place Shopping Center	C	3	0.43	2	3	15,520	8.21	3	15,350	9.55	4	14,560	5.69	7.82	46.89
			Market Place Shopping Center	Enterprise Rd.	Enterprise Rd.	C	3	0.23	1	35	17,075	24.42	31	14,720	25.09	44	16,160	32.43	27.31	81.94
			Enterprise Rd.	Threadgil Pl.	Threadgill Pl.	E	5	0.23	1	14	34,780	4.79	10	32,290	3.69	14	31,790	5.25	4.58	22.88
			Threadgill Pl.	Veterans Memorial Pkwy.	Veterans Memorial Pkwy.	E	5	0.41	1	54	35,790	10.08	58	32,660	11.87	67	32,130	13.93	11.96	59.81
			Veterans Memorial Pkwy.	Park and Ride Lot	Park and Ride Lot	F	6	0.33	1	6	48,090	1.04	15	45,170	2.76	25	44,450	4.67	2.82	16.92
			Park and Ride Lot	I-4		F	6	0.25			48,090			45,170			39,780			
			I-4	Finland Dr.	Finland Dr.	F	6	0.41	1	18	50,330	2.39	27	45,250	3.99	21	46,890	2.99	3.12	18.74
			Finland Dr.	Normandy Blvd.	Normandy Blvd.	F	6	0.34	1	27	44,490	4.89	28	40,010	5.64	25	38,680	5.21	5.25	31.48
			Normandy Blvd.	Urbana Ave.		D	4	0.61			28,380			25,440			24,990			
			Urbana Ave.	Tivoli Dr.	Tivoli Dr.	C	3	0.86	1	8	22,090	1.15	8	20,380	1.25	8	21,100	1.21	1.20	3.61
			Tivoli Dr.	Page Dr.		D	4	0.44			12,560			11,020			10,520			
			Page Dr.	Providence Blvd.	Providence Blvd.	D	4	0.38	1	8	10,740	5.37	11	10,710	7.41	5	11,580	3.11	5.30	21.18
			Providence Blvd.	Waycross Cir.		F	6	0.29			9,880			10,040			10,790			
			Waycross Cir.	Normandy Blvd.	Normandy Blvd.	E	5	0.43	1	9	8,170	7.02	7	7,520	5.93	6	8,450	4.52	5.82	29.12
			Normandy Blvd.	Coble Dr.		D	4	0.55			6,660			5,880			6,490			
			Coble Dr.	Doyle Rd.	Doyle Rd.	D	4	0.62	1	11	6,790	7.16	11	6,700	7.25	10	7,300	6.05	6.82	27.29
SAXON BOULEVARD						**E**	**5**	**6.81**	**8**			**6.96**			**7.67**			**7.73**	**7.45**	**298.19**

CORRIDOR PRIORITY ANALYSIS

Segments without signalized intersection not included in analysis. | Intersection with Opticom System

SECTION	M.P.	SR #	FROM	TO	SIGNALIZED INTERSECTION	LOS	LOS VALUE	SEGMENT LENGTH	# TRAFFIC SIGNALS	CRASH FREQUENCY (2005)	ADT (2005)	CRASH RATE (2005)	CRASH FREQUENCY (2006)	ADT (2006)	CRASH RATE (2006)	CRASH FREQUENCY (2007)	ADT (2007)	CRASH RATE (2007)	AVERAGE CRASH RATE	SPS SCORE
HOWLAND BOULEVARD																				
			I 4		Graves Ave. Forest Edge Dr. Wolf Pack Run					13 10 12			18 11 10			25 7 11				
				Wolf Pack Run	Wolf Pack Run	E	5	1.00	3		29,420	3.26		34,200	3.12		31,910	3.69	3.36	50.38
			Wolf Pack Run	Red Fox Run		D	4	0.28	0		25,820			29,860			27,980			
			Red Fox Run	Catalina Blvd.	Catalina Blvd.	D	4	0.92	1	23	26,100	2.62	33	30,200	3.25	26	28,610	2.71	2.86	11.45
			Catilina Blvd.	Bluffview Cir.		D	4	0.24	0		19,170			22,740			21,780			
			Bluffview Cir.	Providence Blvd.	Providence Blvd.	D	4	0.12	1	5	19,850	5.75	7	23,670	6.75	11	22,660	11.08	7.86	31.45
			Providence Blvd.	Adelia Blvd.		F	6	0.50	0		14,380			14,610			16,590			
			Adelia Blvd.	Elkcam Blvd.	Elkcam Blvd.	E	5	1.58	1	28	13,230	3.67	24	15,250	2.73	38	14,720	4.48	3.63	18.13
			Elkcam Blvd.	Lake Helen-Osteen Rd.		F	6	0.30	0		16,610			18,200			17,460			
			Lake Helen-Osteen Rd.	Day Rd.		F	6	0.20	0		19,200			21,180			20,690			
			Day Rd.	Newmark Dr.	Newmark Dr.	F	6	0.48	1	8	16,350	2.79	11	19,530	3.21	10	19,440	2.94	2.98	17.89
			Newmark Dr.	Roble Ln.		F	6	0.71	0		14,960			16,580			16,820			
			Roble Ln.	Courtland Blvd.	Courtland Blvd.	F	6	0.38	1	12	13,090	6.61	6	13,620	3.18	8	15,800	3.65	4.48	26.87
			Courtland Blvd.	Fish Hawk Rd.	Fish Hawk Rd.	D	4	1.15	1	2	9,300	0.51	2	11,280	0.42	1	12,690	0.19	0.37	1.50
			Fish Hawk Rd.	Ft. Smith Blvd.	Ft. Smith Blvd.	D	4	0.54	1	1	7,910	0.64	6	10,050	3.03	9	11,850	3.85	2.51	10.03
			Ft. Smith Blvd.	Tabb Dr.		D	4	0.26	0		7,770			8,220			11,730			
			Tabb Rd.	SR 415		C	3	0.42	0		7,470			7,910			8,440			
HOWLAND BOULEVARD						**D**	**4**	**9.08**	**10**			**3.23**			**3.21**			**4.07**	**3.51**	**140.25**
WILLIAMSON BOULEVARD																				
			SR 40		SR 40 Shopping Center Entrance					35 1			39 6			24 3				
				Midpoint		D	4	0.31	2		21,200	15.01		20,890	19.04		22,070	10.81	14.95	119.62
			Midpoint	Hand Ave.	Hand Ave.	C	3	0.31	1	11	19,000	5.12	12	18,600	5.70	13	19,610	5.86	5.56	16.68
			Hand Ave.	Strickland Range Blvd.		E	5	1.12	0		14,310			13,810			14,940			
			Strickland Range Blvd.	LPGA Blvd.	LPGA Blvd.	F	6	0.95	1	37	15,480	6.89	25	15,090	4.78	23	16,040	4.14	5.27	31.61
			LPGA Blvd.	SR 430	SR 430	F	6	0.70	1	18	16,900	4.17	18	16,710	4.22	12	17,580	2.67	3.69	22.11
			SR 430	Dunn Ave.	Dunn Ave.	F	6	0.87	1	11	15,630	2.22	5	15,570	1.01	12	16,650	2.27	1.83	10.99
			Dunn Ave.	US 92	US 92	F	6	1.49	1	95	16,270	10.74	54	16,220	6.12	59	17,510	6.20	7.68	46.11
			US 92	Midway Ave.	Midway Ave.	C	3	0.57	1	15	10,450	6.90	12	10,730	5.38	11	11,530	4.59	5.62	16.86
			Midway Ave.	Bellevue Ave. Ext.	Bellevue Ave.	C	3	0.50	1	20	15,740	6.96	11	15,950	3.78	8	17,130	2.56	4.43	13.30
			Bellevue Ave. Ext	midpoint		C	3	0.53	0		17,330			17,390			18,650			
			midpoint	Beville Rd.	Beville Rd.	C	3	0.53	1	25	17,590	7.35	17	17,570	5.00	38	18,910	10.39	7.58	22.74
			Beville Rd.	Madeline Ave.	Madeline Ave.	E	5	1.86	0	4	14,020	0.42	3	14,010	0.32	5	14,990	0.49	0.41	0.00
			Madeline Ave.	Willow Run Blvd.		E	5	0.81	0		13,860			13,810			14,890			
			Willow Run Blvd.	I 95 Bridge		D	4	0.25	0		11,390			11,380			12,360			
			I 95 Bridge	Taylor Rd.	Taylor Rd.	D	4	1.68	1	48	13,160	5.95	52	13,070	6.49	26	14,270	2.97	5.14	20.54
			Taylor Rd.	Spruce Creek Bridge		F	6	1.05	0		19,810			19,780			18,900			
			Spruce Creek Bridge	Roscoe Turner Tr.		F	6	0.95	0		15,460			15,680			15,640			
WILLIAMSON BOULEVARD						**D**	**4**	**14.48**	**11**			**6.52**			**5.62**			**4.81**	**5.65**	**248.64**



APPENDIX D
Preliminary Cost Analysis

Fire Equipment Preemption Cost

Station	Location (Station Name)	Apparatus	Opticom GPS	Opticom Infrared	SONEM 2000
City of Daytona Beach					
Station 1 - 301 S. Beach St.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
		Battalion	$3,650	$1,610	$0
Station 2 - 126 Botefuhr Ave.					
		Squirt	$3,650	$1,610	$0
Station 3 - 945 N. Halifax Ave.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 4 - 1675 Mason Ave.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 5 - 627 N. Nova Rd.					
		Tower	$3,650	$1,610	$0
		Engine	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
Station 6 -2020 Beville Rd.					
		Engine	$3,650	$1,610	$0
Station 7 - 2545 LPGA Blvd.					
		Engine	$3,650	$1,610	$0
		Total	**$47,450**	**$20,930**	**$0**
City of Deltona					
Station 61 - 1685 Providence Blvd.					
		Ladder	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 62 - 320 Diamond St.					
		Engine	$3,650	$1,610	$0
Station 63 - 2147 Howland Blvd.					
		Engine	$3,650	$1,610	$0
		Engine	$3,650	$1,610	$0
Station 64 - 236 Fort Smith Blvd.					
		Engine	$3,650	$1,610	$0
		Total	**$21,900**	**$9,660**	**$0**
City of Deland					
Station 81 - 210 W. Howry Ave.					
		Ladder	$3,650	$1,610	$0
		Engine	$3,650	$1,610	$0
		Battalion	$3,650	$1,610	$0
Station 82 - 257 W. International Speedway Blvd.					
		Engine	$3,650	$1,610	$0
Station 83 - 1695 E. Taylor Rd.					
		Engine	$3,650	$1,610	$0
		Total	**$18,250**	**$8,050**	**$0**
City of Port Orange					
Station 71 - 4200 Ridgewood Ave.					
		Engine	$2,900	$0	$0
Station 72 - 5839 Trailwood Dr.					
		Engine	$2,900	$0	$0
Station 73 - 1090 City Center Blvd.					
		Engine	$2,900	$0	$0
		Squirt	$2,900	$0	$0
		Battalion	$2,900	$0	$0
Station 74 - 6701 Airport Rd.					
		Engine	$2,900	$0	$0
		Total	**$17,400**	**$0**	**$0**
City of South Daytona					
Station 98 - 1672 S. Ridgewood Ave.					
		Engine	$3,650	$1,610	$0
		Total	**$3,650**	**$1,610**	**$0**
Ctiy of Daytona Beach Shores					
Station 76 - 3050 S. Atlantic Ave.					
		Engine	$3,650	$1,610	$0
		Squirt	$3,650	$1,610	
		Total	**$7,300**	**$3,220**	**$0**

Existing Opticom Infrared (GPS Trade up Value = 25%)

Existing Opticom GPS

Fire Equipment Preemption Cost

Station	Location (Station Name)	Apparatus	Opticom GPS	Opticom Infrared	SONEM 2000
Volusia County					
Station 11 - 1580 Derbyshire Rd.	Holly Hill (Halifax 11)				
		Engine	$3,650	$1,610	$0
Station 12 - 1979 Taylor Rd.	Port Orange (Spruce Creek)				
		Engine	$3,650	$1,610	$0
		Heavy Rescue	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
Station 13 - 15 Southland Rd.	Ormond Beach (Halifax)				
		Engine	$3,650	$1,610	$0
		Heavy Rescue	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
Station 14 - 1716 Atlantic Ave.	Ormond Beach (North Peninsula)				
		Engine	$3,650	$1,610	$0
Station 15 - 3889 Tiger Bay Rd.	Daytona Beach (Fire Science Institude)				
		Engine	$3,650	$1,610	$0
Station 16 - 3935 Old Dixie Hwy.	Ormond Beach (Halifax Plantation)				
		Engine	$3,650	$1,610	$0
Station 18 - 500 Rodeo Dr.	Ormond Beach (Rima Ridge)				
		Engine	$3,650	$1,610	$0
Station 21 - 4840 S. Atlantic Dr.	New Smyrna Beach (South Beach)				
		Engine	$3,650	$1,610	$0
		Light Rescue	$3,650	$1,610	$0
Station 22 - 213 N. US Hwy. 1	Oak Hill (Oak Hill)				
		Engine	$3,650	$1,610	$0
Station 23 - 1850 Pioneer Tr.	New Smyrna Beach (Turnbull)				
		Engine	$3,650	$1,610	$0
		Heavy Rescue	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
Station 31 - 2850 Firehouse Rd.	Deland (Spring Lake 32)				
		Engine	$3,650	$1,610	$0
Station 32 - 1970 S. Volusia Ave.	Orange City				
		Engine	$3,650	$1,610	$0
Station 33 - 93 US Hwy. 17-92	Debary (Debary)				
		Engine	$3,650	$1,610	$0
Station 34 - 1700 Enterprise/Osteen Rd.	Osteen (Indian Mound)				
		Engine	$3,650	$1,610	$0
		Light Rescue	$3,650	$1,610	$0
Station 35 - 630 W. Main St.	Lake Helen (Lake Helen)				
		Engine	$3,650	$1,610	
		Heavy Rescue	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
Station 36 - 180 N. State Rd. 415	Osteen (Osteen)				
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 37 - 740 Lake Harney Woods Blvd.	Mims (Lake Harney)				
		Engine	$3,650	$1,610	$0
Station 41 - 5007 Central Ave.	DeLeon Springs (DeLeon Springs)				
		Engine	$3,650	$1,610	$0
Station 42 - 1885 Kepler Rd.	Deland (Kepler Ridge)				
		Engine	$3,650	$1,610	$0
Station 43 - 1580 US Hwy. 17	Seville (Seville)				
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 44 - 132 N. Fountain Dr.	Pierson (Pierson)				
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
Station 45 - 2580 W. SR 44	Deland (St. Johns)				
		Engine	$3,650	$1,610	$0
Station 46 - 920 Glenwood Rd.	DeLand (Glenwood)				
		Engine	$3,650	$1,610	$0
		Heavy Rescue	$3,650	$1,610	$0
		Squad	$3,650	$1,610	$0
		Total	**$138,700**	**$61,180**	**$0**
Orange City					
Station 67 - 215 N. Holly Ave.					
		Engine	$3,650	$1,610	$0
		Ladder	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
		Battalion	$3,650	$1,610	$0
Station 68 - 743 Harley Strickland Blvd.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
		Total	**$21,900**	**$9,660**	**$0**

Existing Opticom Infrared (GPS Trade up Value = 25%)

Existing Opticom GPS

Fire Equipment Preemption Cost

Station	Location (Station Name)	Apparatus	Opticom GPS	Opticom Infrared	SONEM 2000
City of Ormond Beach					
Station 91 - 364 S. Atlantic Ave.					
		Quint	$0	$0	$0
Station 92 - 189 S. Nova Rd.					
		Quint	$0	$0	$0
		Engine	$2,900	$0	$0
		Battalion	$0	$0	$0
Station 93 - 300 Wilmette Ave.					
		Engine	$0	$0	$0
Station 94 - 2301 Airport Rd.					
		Engine	$0	$0	$0
		Total	**$2,900**	**$0**	**$0**
City of Edgewater					
Station 55 - 106 Rhode Island St.					
		Engine	$3,650	$1,610	$0
		Squad	$3,650	$1,610	
Station 57 - 2628 Hibiscus Dr.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
		Total	**$14,600**	**$6,440**	**$0**
City of New Symrna Beach					
Station 50 - 103 Faulkner St.					
		Engine	$3,650	$1,610	$0
Station 51 - 151 Williamson Blvd.					
		Engine	$3,650	$1,610	$0
Station 52 - 309 Columbus Ave.					
		Engine	$3,650	$1,610	$0
Station 53 - 1400 N. Dixie Hwy					
		Engine	$3,650	$1,610	$0
		Total	**$14,600**	**$6,440**	**$0**
City of Holly Hill					
Station 96 - 1020 Daytona Ave.					
		Engine	$3,650	$1,610	$0
		Total	**$3,650**	**$1,610**	**$0**
City of Ponce Inlet					
Station 78 - 4680 S. Peninsula Dr.					
		Engine	$3,650	$1,610	$0
		Rescue	$3,650	$1,610	$0
		Total	**$7,300**	**$3,220**	**$0**

Existing Opticom Infrared (GPS Trade up Value = 25%)

Existing Opticom GPS

Intersection Preemption Cost

= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
US 92									
79060	0.000	600	US 17	DeLand	4	NSEW	$5,900	$12,310	$9,175
	0.251		Amelia Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	0.501		Garfield Ave.	DeLand	4	NSEW	$5,900	$0	$7,850
	1.406		Jacobs Rd.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	2.638		Kepler Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	11.595		Indian Lake Rd.	Volusia County	3	NEW	$5,300	$12,310	$9,175
	13.993		LPGA Blvd.	Volusia County	3	NEW	$5,300	$12,310	$9,175
	15.609		Tomoka Farms Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	16.088		I-95 NB Exit Ramp	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
	16.401		Indigo Dr.	Daytona Beach	3	NEW	$5,300	$12,310	$9,175
	16.534		Thames Rd.	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
	16.733		Williamson Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	17.043		Kennel Club	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
	17.179		Fentress Blvd.	Daytona Beach	3	NEW	$5,300	$12,310	$9,175
	17.427		Plaza Entrance	Daytona Beach	2	W(E LEFT)	$4,700	$12,310	$9,175
	17.615		Industrial Parkway	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	17.860		Bill France Blvd	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	18.117		Midway Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	18.405		Hagen Terrace	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	18.716		SR 483	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	19.254		White St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	19.376		Seneca Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	19.648		SR 5A	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	19.911		Adams St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	20.276		Lincoln St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	20.424		Martin Luther King Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	20.766		US 1	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79080	0.110	600	Palmetto Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.230		Beach St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.059		Halifax Dr.	Daytona Beach	3	NEW	$5,300	$12,310	$9,175
	1.114		SR 441	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.316		Grandview Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.407		SR A1A	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
							$188,700	**$393,920**	**$301,450**
SR 44									
79070	3.862	44	SR 15A	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	4.361		Stone St.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	4.871		Clara Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	5.000		Florida Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	5.122		US 17-92	DeLand	4	NSEW	$5,900	$12,310	$9,175
	5.246		Alabama Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	5.375		Amelia Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	6.372		Hill Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	6.879		Blue Lake Ave.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	7.817		Kepler Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
			Summit Ave.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
			I 4 WB Ramps	Volusia County	2	E (W LEFT)	$4,700	$12,310	$9,175
	10.721		Prevatt Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	20.207		SR 415	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	25.155		I 95 NB Ramps	Volusia County	3	SEW	$5,300	$12,310	$9,175
	26.185		Glencoe Rd.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	27.589		Eddie Rd.	Symrna Beach	3	NEW	$5,300	$12,310	$9,175
	27.936		Wallace Rd.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	28.777		Myrtle Ave.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
							$109,700	**$233,890**	**$174,325**
SR 400									
79001	0.283	400	Williamson Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.194		SR 483	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.658		Bellenova Shopping Center	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.871		Nova Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	3.221		Magnolia Ave.	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
	3.864		Golfview Blvd.	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
	4.216		US 1	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
							$39,500	**$86,170**	**$64,225**

Intersection Preemption Cost

= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
US 1									
79030	11.450	5	Destination Daytona	Volusia County	3	NSE	$5,300	$12,310	$9,175
	11.252		I 95 SB Ramps	Volusia County	3	NSE	$5,300	$12,310	$9,175
	11.066		I 95 NB Ramps	Volusia County	3	NSE	$5,300	$12,310	$9,175
	8.453		Airport Rd.	Volusia County	3	NSW	$5,300	$12,310	$9,175
	7.336		Nova Rd.	Ormond Beach	3	NSW	$5,300	$0	$7,850
	6.223		Wilmette Ave.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	5.509		SR 40	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	4.911		Division Ave.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	4.666		Hand Ave.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	3.849		Calle Grande St.	Volusia County	3	NSW	$5,300	$12,310	$9,175
	3.400		Flomich Ave.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	2.913		Walker St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	2.664		LPGA Blvd.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	2.167		8th St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	1.916		6th St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	1.567		3rd St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	1.390		2nd St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	1.192		SR 430	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	0.963		Madison Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.664		Fairview Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.544		Mullally St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.356		Dr. Mary McLeod Bethune Blvd	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.144		Bay St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.000		US 92	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79010	32.540	5	Magnolia Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	32.394		Orange Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	31.669		Bellevue Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	31.010		Wilder Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	30.623		Beville Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	30.422		Ferndale Ave.	South Daytona	3	NSW	$5,300	$0	$7,850
	29.908		Big Tree Rd.	South Daytona	4	NSEW	$5,900	$12,310	$9,175
	29.402		Ridge Blvd.	South Daytona	4	NSEW	$5,900	$12,310	$9,175
	28.740		Reed Canal Rd.	South Daytona	4	NSEW	$5,900	$12,310	$9,175
	28.371		Venture Dr.	South Daytona	3	NSW	$5,300	$12,310	$9,175
	27.704		Herbert St.	Port Orange	4	NSEW	$5,900	$0	$7,850
	27.560		SR 421	Port Orange	4	NSEW	$5,900	$0	$7,850
	27.375		Meeker Pl.	Port Orange	4	NSEW	$5,900	$0	$7,850
	26.186		Commonwealth Blvd.	Port Orange	4	NSEW	$5,900	$0	$7,850
	24.954		Nova Rd.	Port Orange	3	NSW	$5,300	$0	$7,850
	19.519		Turnbull Bay Rd.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	18.954		Wayne Ave.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	18.343		Washington Ave.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	18.176		Canal St.	Symrna Beach	4	NSEW	$5,900	$12,310	$9,175
	17.969		Lytie Ave.	Symrna Beach	3	NSE	$5,300	$12,310	$9,175
	16.655		10th St.	Symrna Beach	3	NSW	$5,300	$12,310	$9,175
	15.652		Park Ave.	Edgewater	4	NSEW	$5,900	$12,310	$9,175
	14.166		SR 442	Edgewater	4	NSEW	$5,900	$12,310	$9,175
	13.643		Falcon Ave.	Edgewater	4	NSEW	$5,900	$12,310	$9,175
	12.290		Roberts Rd.	Edgewater	3	NSW	$5,300	$12,310	$9,175
							$281,900	**$467,780**	**$435,000**
SR 40									
79100	6.427	40	US 17	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	13.117		SR 11	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	24.523		Breakaway Tr.	Ormond Beach	3	NEW	$5,300	$0	$7,850
	25.492		Tymber Creek Rd.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	26.022		Booth Rd.	Ormond Beach	4	NSEW	$5,900	$12,310	$9,175
	26.286		I 95 SB Ramps	Ormond Beach	3	NEW	$5,300	$12,310	$9,175
	26.351		I 95 NB Ramps	Ormond Beach	3	SEW	$5,300	$12,310	$9,175
	26.504		Williamson Blvd.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	27.002		Seminole Dr.	Ormond Beach	3	NEW	$5,300	$0	$7,850
	27.866		SR 483	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	28.192		Old Tomoka Rd.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	28.908		SR 5A	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	29.799		Orchard St.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	30.317		US 1	Ormond Beach	4	NSEW	$5,900	$0	$7,850
							$80,200	**$61,550**	**$116,525**

Intersection Preemption Cost

= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
SR A1A									
	9.017		Publix Entrance	Ormond Beach	3	NSW	$5,300	$12,310	$9,175
	7.357		Neptune Ave.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	6.662		SR 40	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	5.974		Fire Station	Ormond Beach	3	NSE	$5,300	$0	$7,850
	5.414		Cardinal Dr.	Ormond Beach	4	NSEW	$5,900	$12,310	$9,175
	4.962		Harvard Dr.	Ormond Beach	4	NSEW	$5,900	$12,310	$9,175
	4.618		Plaza Blvd.	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	4.432		Bellair Plaza	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	4.181		Williams Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	3.702		Seaview Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	3.207		Driftwood Ave	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	2.930		University Blvd	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.433		SR 430	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.309		Oakridge Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.122		Ora St.	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	2.003		Earl St.	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	1.884		Auditorium Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.767		Main St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.649		Harvey Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.407		US 92	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79180	5.922		Silver Beach Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	5.194		Botefuhr Ave.	DBS	3	NSW	$5,300	$12,310	$9,175
	4.664		Moore Ave.	DBS	3	NSW	$5,300	$12,310	$9,175
	2.388		Emergency Signal	DBS	3	NSW	$5,300	$0	$7,850
	1.246		Dunlawton Ave.	DBS	4	NSEW	$5,900	$12,310	$9,175
	1.085		Peninsula Dr.	Port Orange	4	NSEW	$5,900	$0	$7,850
	0.000		US 1	Port Orange	4	NSEW	$5,900	$12,310	$9,175
							$153,300	**$270,820**	**$241,100**
SR 5A									
79190	15.606	5A	US 1	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	14.610		Wilmette Ave.	Ormond Beach	4	NSEW	$5,900	$12,310	$0
	14.101		SR 40	Ormond Beach	4	NSEW	$5,900	$0	$7,850
	13.874		Emergency Signal	Ormond Beach	3	NSE	$5,300	$0	$7,850
	13.781		Woodlands Blvd.	Ormond Beach	4	NSEW	$5,900	$12,310	$0
	13.199		Division Ave.	Ormond Beach	3	NSE	$5,300	$0	$7,850
	12.952		Hand Ave.	Ormond Beach	4	NSEW	$5,900	$12,310	$0
	12.706		Fleming Ave.	Ormond Beach	4	NSEW	$5,900	$12,310	$9,175
	12.202		Golf Ave.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	11.696		Flomich Ave.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	11.425		15th St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	11.151		Walker St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	10.891		LPGA Blvd.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	10.389		8th St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	10.142		6th St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	9.791		3rd St.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
	9.619		Brentwood Dr.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	9.423		SR 430	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	9.205		Madison Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	8.785		George W. Engram Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	8.481		Mary McLeod Bethune Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	8.201		US 92	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	7.940		Orange Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	7.130		Bellevue Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	6.127		Beville Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	5.429		Big Tree Rd.	South Daytona	4	NSEW	$5,900	$12,310	$9,175
	4.576		Reed Canal Rd.	South Daytona	4	NSEW	$5,900	$12,310	$9,175
	3.822		Madeline Ave.	Port Orange	4	NSEW	$5,900	$0	$7,850
	3.307		Herbert St.	Port Orange	4	NSEW	$5,900	$0	$7,850
	2.521		SR421	Port Orange	4	NSEW	$5,900	$0	$7,850
	2.299		Village Tr.	Port Orange	4	NSEW	$5,900	$0	$7,850
	1.437		Spruce Creek Rd.	Port Orange	4	NSEW	$5,900	$0	$7,850
	0.000		US 1	Port Orange	4	NSEW	$5,900	$0	$7,850
							$193,500	**$283,130**	**$262,000**
SR 15A									
79160	5.787	15	Glenwood Rd.	Volusia County	4	NSEW	$5,900	$0	$7,850
	4.591		CR 92	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	3.766		Plymouth Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	3.262		Minnesota Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	2.759		SR 44	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	2.266		Euclid Ave.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	1.759		Beresford Ave.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	0.000		US 17-92	DeLand	4	NSEW	$5,900	$12,310	$9,175
							$47,200	**$86,170**	**$72,075**

Intersection Preemption Cost

= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
SR 483									
			SR 40	Ormond Beach	4	NSEW	$5,900	$0	$7,850
			Hand Ave.	Ormond Beach	4	NSEW	$5,900	$0	$7,850
			Strickland Range Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			LPGA Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Bill France Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Jimmy Ann Dr.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			SR 430	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79270	2.812	483	Dunn Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.555		Mayberry Ave.	Daytona Beach	3	NSE	$5,300	$12,310	$9,175
	2.402		Hospital Entrance	Daytona Beach	3	NSE	$5,300	$12,310	$9,175
	2.179		US 92	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.770		Richard Petty Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.475		Embry Riddle	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.984		Bellvue Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.697		Bellvue Ave. Ext.	Daytona Beach	3	NSW	$5,300	$12,310	$9,175
	0.000		Beville Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Big Tree Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Reed Canal Rd.	Port Orange	3	NSE	$5,300	$0	$7,850
			Madeline St.	Port Orange	4	NSEW	$5,900	$0	$7,850
			Herbert St.	Port Orange	3	NSE	$5,300	$0	$7,850
			Willow Run Blvd.	Port Orange	4	NSEW	$5,900	$0	$7,850
			SR 421	Port Orange	4	NSEW	$5,900	$0	$7,850
							$126,800	**$184,650**	**$192,575**
US 17-92									
79040	14.345	15/600	Plymouth Ave	DeLand	4	NSEW	$5,900	$12,310	$9,175
	14.087		Pennsylvania Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.838		Minnesota Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.581		Wisconsin Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.456		Rich Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.393		Indiana Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.331		SR 44	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.207		Howry Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	13.086		Voorhis Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	12.345		Beresford Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	11.829		New Hampshire Ave.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	11.322		SR 15A	DeLand	4	NSEW	$5,900	$12,310	$9,175
	10.291		Orange Camp Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	10.020		Firehouse Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	9.282		Minnesota Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	8.828		New York Ave.	Orange City	3	NSW	$5,300	$12,310	$9,175
	8.082		French Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	7.832		Graves Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	7.447		Blue Springs Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	7.198		Ohio Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	6.826		Rhode Island Ave.	Orange City	4	NSEW	$5,900	$12,310	$9,175
	6.075		Enterprise Rd.	Orange City	3	NSE	$5,300	$12,310	$9,175
	5.277		Saxon Blvd.	Debary	3	NSE	$5,300	$12,310	$9,175
	4.666		Debary Plantation Blvd.	Debary	3	NSW	$5,300	$12,310	$9,175
	4.231		Dogwood Tr.	Debary	4	NSEW	$5,900	$12,310	$9,175
	3.749		Highbanks Rd.	Debary	4	NSEW	$5,900	$12,310	$9,175
	1.980		Dirksen Dr.	Debary	4	NSEW	$5,900	$12,310	$9,175
							$156,900	**$332,370**	**$247,725**
LPGA BOULEVARD									
			I-95 SB Exit Ramp	Daytona Beach	3	NEW	$5,300	$12,310	$9,175
			I 95 NB Exit Ramp	Daytona Beach	3	SEW	$5,300	$12,310	$9,175
			Williamson Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			SR 483	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Derbyshire Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
			SR 5A	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
			Center Ave.	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
			US 1	Holly Hill	4	NSEW	$5,900	$12,310	$9,175
							$46,000	**$98,480**	**$73,400**

Intersection Preemption Cost

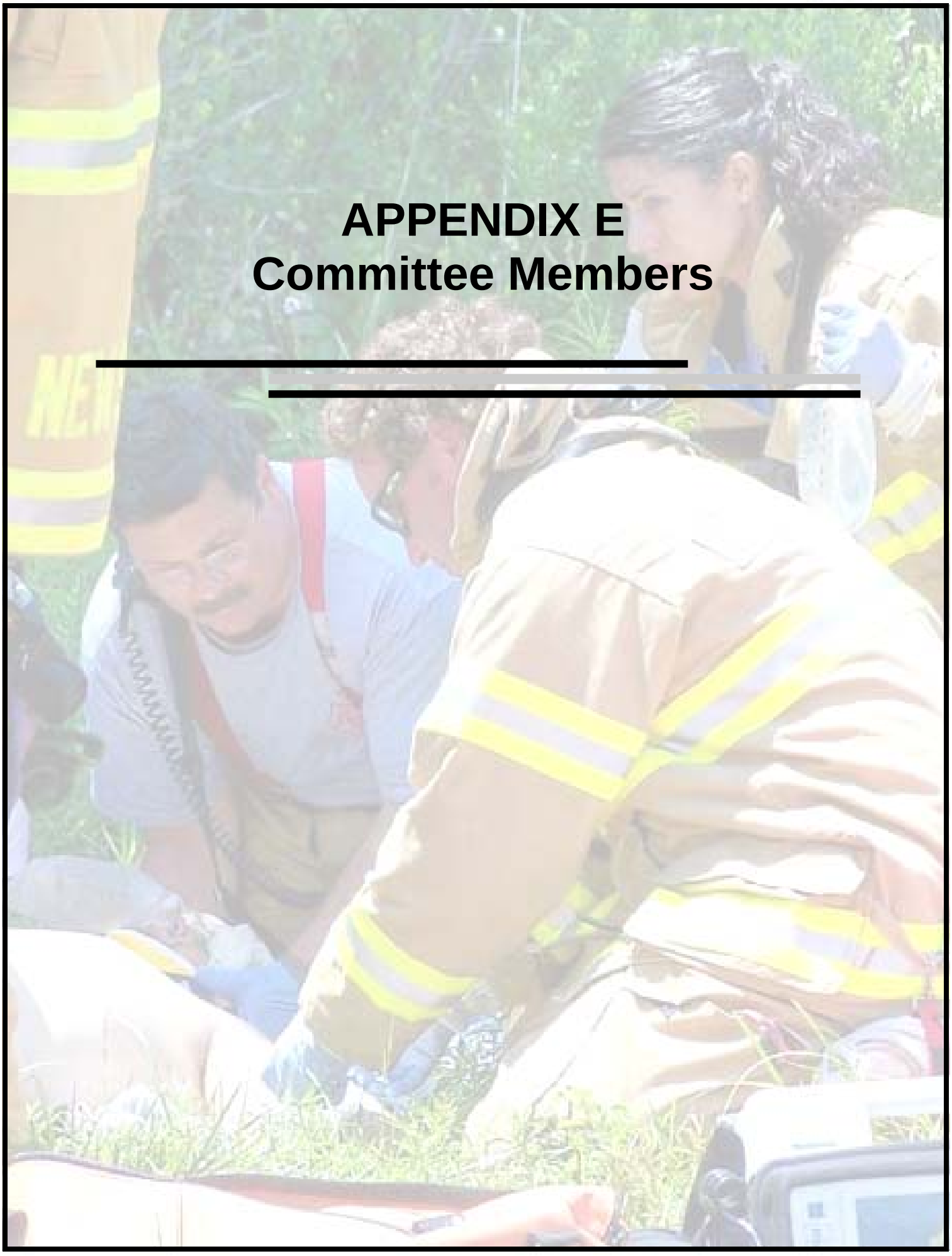
= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
US 17									
79050	22.466	15	CR 305	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	17.213		Washington Ave.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	12.183		SR 40	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	2.824		SR 15A	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	1.198		Glenwood Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
	0.426		Violetwood Rd.	DeLand	4	NSEW	$5,900	$12,310	$9,175
	0.000		US 92	DeLand	4	NSEW	$5,900	$12,310	$9,175
							$41,300	**$86,170**	**$64,225**
SR 430									
79050	0.000	15	SR 483	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.432		Derbyshire Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.539		White St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.748		Vine St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.990		SR 5A	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.505		Center St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	1.953		Carswell Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.069		US 1	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	2.370		Beach St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79220001	0.620		Halifax Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.703		Peninsula Dr.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.983		SR A1A	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
79220002	0.000		SR A1A	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.067		Grandview Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.134		Wild Olive Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.217		Oleander Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.285		Peninsula Dr.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.367		Halifax Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
	0.997		Beach St.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
							$112,100	**$233,890**	**$174,325**
SR 421									
			Tomoka Farms Rd.	Volusia County	4	NSEW	$5,900	$12,310	$9,175
			Williamson Blvd.	Port Orange	4	NSEW	$5,900	$0	$7,850
			I 95 SB Ramps	Port Orange	3	NEW	$5,300	$0	$7,850
79230	0.424	421	Taylor Rd.	Port Orange	3	SEW	$5,300	$0	$7,850
	0.730		Yorktowne Blvd.	Port Orange	3	NEW	$5,300	$0	$7,850
	1.068		SR 483	Port Orange	4	NSEW	$5,900	$0	$7,850
	1.472		Victoria Gardens Blvd.	Port Orange	4	NSEW	$5,900	$0	$7,850
	1.880		Swallow Tail Dr.	Port Orange	4	NSEW	$5,900	$0	$7,850
	2.382		SR 5A	Port Orange	4	NSEW	$5,900	$0	$7,850
	3.292		Spruce Creek Rd.	Port Orange	4	NSEW	$5,900	$0	$7,850
	4.001		US 1	Port Orange	4	NSEW	$5,900	$0	$7,850
							$63,100	**$12,310**	**$87,675**
SAXON BOULEVARD									
			US 17-92	Debary	3	NSEW	$5,300	$12,310	$9,175
			Market Place Shopping Center	Orange City	4	NSEW	$5,900	$12,310	$9,175
			Enterprise Rd.	Orange City	4	NSEW	$5,900	$12,310	$9,175
			Threadgill Pl.	Orange City	3	NEW	$5,300	$12,310	$9,175
			Veterans Memorial Pkwy.	Orange City	4	NSEW	$5,900	$12,310	$9,175
			Park and Ride Lot	Orange City	4	NSEW	$5,900	$12,310	$9,175
			Finland Dr.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Normandy Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Tivoli Dr.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Providence Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Normandy Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Doyle Rd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
							$69,600	**$147,720**	**$110,100**
HOWLAND BOULEVARD									
			Graves Ave.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Forest Edge Dr.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Wolf Pack Run	Deltona	3	NSE	$5,300	$12,310	$9,175
			Catalina Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Providence Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Elkcam Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Newmark Dr.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Courtland Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Fish Hawk Rd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
			Ft. Smith Blvd.	Deltona	4	NSEW	$5,900	$12,310	$9,175
							$58,400	**$123,100**	**$91,750**

Intersection Preemption Cost

= Existing Opticom Infrared (GPS Trade up Value = 25%) = Existing Opticom GPS

SECTION	M.P.	SR #	SIGNALIZED INTERSECTION	LOCATION	# OF DIRECTIONS	DIRECTIONS	SONEM 2000	OPTICOM INFRARED	OPTICOM GPS
WILLIAMSON BOULEVARD									
			SR 40	Ormond Beach	4	NSEW	$5,900	$0	$7,850
			Shopping Center Entrance	Ormond Beach	4	NSEW	$5,900	$12,310	$9,175
			Hand Ave.	Volusia County	3	NSE	$5,300	$12,310	$9,175
			LPGA Blvd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			SR 430	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Dunn Ave.	Daytona Beach	3	NSE	$5,300	$12,310	$9,175
			US 92	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Midway Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Bellevue Ave.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Beville Rd.	Daytona Beach	4	NSEW	$5,900	$12,310	$9,175
			Madeline Ave.	Port Orange	3	NSE	$5,300	$0	$7,850
			Taylor Rd.	Port Orange	4	NSEW	$5,900	$0	$7,850
							$69,000	**$110,790**	**$106,125**



APPENDIX E
Committee Members

Volusia County Preemption Committee Members

Gary Hughes, Fire Chief
Daytona Beach Fire Department
301 South Beach Street
Daytona Beach, FL 32114
Bus: (386) 671-4003
Email: hughesgary@dbfd.uf

Robert Staples, Fire Chief
Deltona Fire Department
1685 Providence Blvd.
Deltona, FL 32725
Bus: (386) 860-7177
Email: rstaples@deltonafl.gov

Thomas G. Weber, Fire Chief
Port Orange Fire & Rescue
6092 Sabal Hammock Circle
Port Orange, FL 32128
Bus: (386) 505-5901
E-mail: tweber@port-orange.org

Skip Irby, Fire Chief
Ormond Beach Fire Department
22 S. Beach Street
Ormond Beach, FL 32174
Bus: (386) 676-3334
Email: irby@ormondbeach.org

Herb Hoffman, Fire Chief
Orange City Fire Department
215 N. Holly Ave
Orange City, FL 32763
Bus: (386) 775-5460
Email: hhoffman@ourorangecity.com

Tim Hawver, Fire Chief
New Smyrna Fire & Rescue Department
103 Faulkner Street
New Smyrna Beach, FL 32168
Bus: (386) 424-2162
Email: thawver@cityofnsb.com

Stephan Cousins, Fire Chief
Edgewater Fire-Rescue
1605 S. Ridgewood Ave.
Edgewater, FL 32132
Bus: (386) 424-2445
Email: scousins@cityofedgewater.org

Stephen Dimbinsky, Director of Public Safety
City of Daytona Beach Shores
2990 S. Atlantic Avenue
Daytona Beach Shores, FL 32118
Bus: (386) 763-5333
Email: sdembinsky@cityofdbs.org

Ron Spencer, Fire Chief
Holly Hill Fire Department
1065 Ridgewood Avenue
Holly Hill, FL 32117
Bus: (386)299-8012
Email: rspencer@hollyhillfl.org

John McDaniel, Fire Chief
DeLand Fire Department
201 W Howry Ave
Deland, FL 32720
Bus: (386) 785-5070
Email: mcdanielj@deland.org

Dan Scales, Fire Chief
Ponce Inlet Fire Rescue
4680 S Peninsula Drive
Ponce Inlet, FL 32127
Bus: (386) 322-6720
Email: dscales@ponce-inlet.org

Tad Derr, Commander
South Daytona Fire-Rescue Department
1672 S. Ridgewood Avenue
South Daytona, FL 32119
Bus: (386) 547-1695
Email: tderr@southdaytona.org

Kathy Weaver
Volusia County Fire Services
125 W. New York Ave., Room 220
DeLand, FL 32720
Bus: (386) 736-5940 Ext 2905
Email: kweaver@co.volusia.fl.us

Robert Keeth, Senior Planner
Volusia County MPO
2570 W. International Speedway Blvd.
Daytona Beach, FL 32114
Bus: (386) 226-0422 ext. 30
Email: rkeeth@co.volusia.fl.us

Jon E. Cheney, Director
Volusia County Traffic Engineering
123 W. Indiana Ave.
DeLand, FL 32720
Bus: (386) 736-5968
Email: jcheney@co.volusia.fl.us

Keith Riger, Director
Deland Public Services
120 S. Florida Ave.
DeLand, FL 32720
Bus: (386) 626-7197
Email: rigerk@deland.org

Mike Marcum, Traffic Engineer
Daytona Beach Traffic Division
950 Bellevue Ave.
Daytona Beach, Fl. 32114
Bus: (386) 671-8650
Email: marcumm@codb.us

Mike Hill, P.E.
Port Orange Community Development
1000 City Center Circle
Port Orange, FL 32128
Bus: (386) 506-5660
Email: mhill@port-orange.org

Dave Denny, Director
Deltona Public Works
2345 Providence Blvd.
Deltona, FL 32725
Bus: (386) 878-8950 Ext. 8972
Email: ddenny@deltonafl.gov

Paul Johnson, Director
Orange City Public Works
1100 S. Thorpe Ave
Orange City, FL 32763
Bus: (386) 775-5447
E-mail: pjohnson@ourorangecity.com

John Noble, Acting City Engineer
Ormond Beach Engineering Division
City Hall, 22 S. Beach Street
Ormond Beach, FL 32174
Bus: (386) 676-3269
Email: noble@ormondbeach.org

Rick Morrow, District Traffic Engineer
Florida Department of Transportation
7195 Woodland Blvd.
DeLand, FL 32720
Bus: (386) 943-5309
Email: rick.morrow@dot.state.fl.us

Khalid Resheidat, Director
New Smyrna Beach Public Works
124 Industrial Park Avenue
New Smyrna Beach, FL 32168
Bus: (386) 424-2209
Email: kresheidat@cityofnsb.com

Mark Juliano, Director
South Daytona Public Works
1770 Segrave Street
South Daytona, FL 32119
Bus: (386) 322-3080
Email: sdpublicworks@southdaytona.org

Kieth Gunter, General Manager
Ponce Inlet Public Works
4300 South Atlantic Avenue
Ponce Inlet, FL 32127
Bus: (386) 236-2181
Email: kgunter@ponce-inlet.org

Chris Hurst, Director
Holly Hill Public Works
1065 Ridgewood Ave.
Holly Hill, Fl 32117
Bus: (386) 248-9463
Email: churst@hollyhillfl.org

Anthony Gonzalez, Assistant City Manager
City of Debary
137 S. U.S. Highway 17/92
Debary, FL 32713
Bus: (386) 668-2040
Email: anthonygonzalez@debary.org

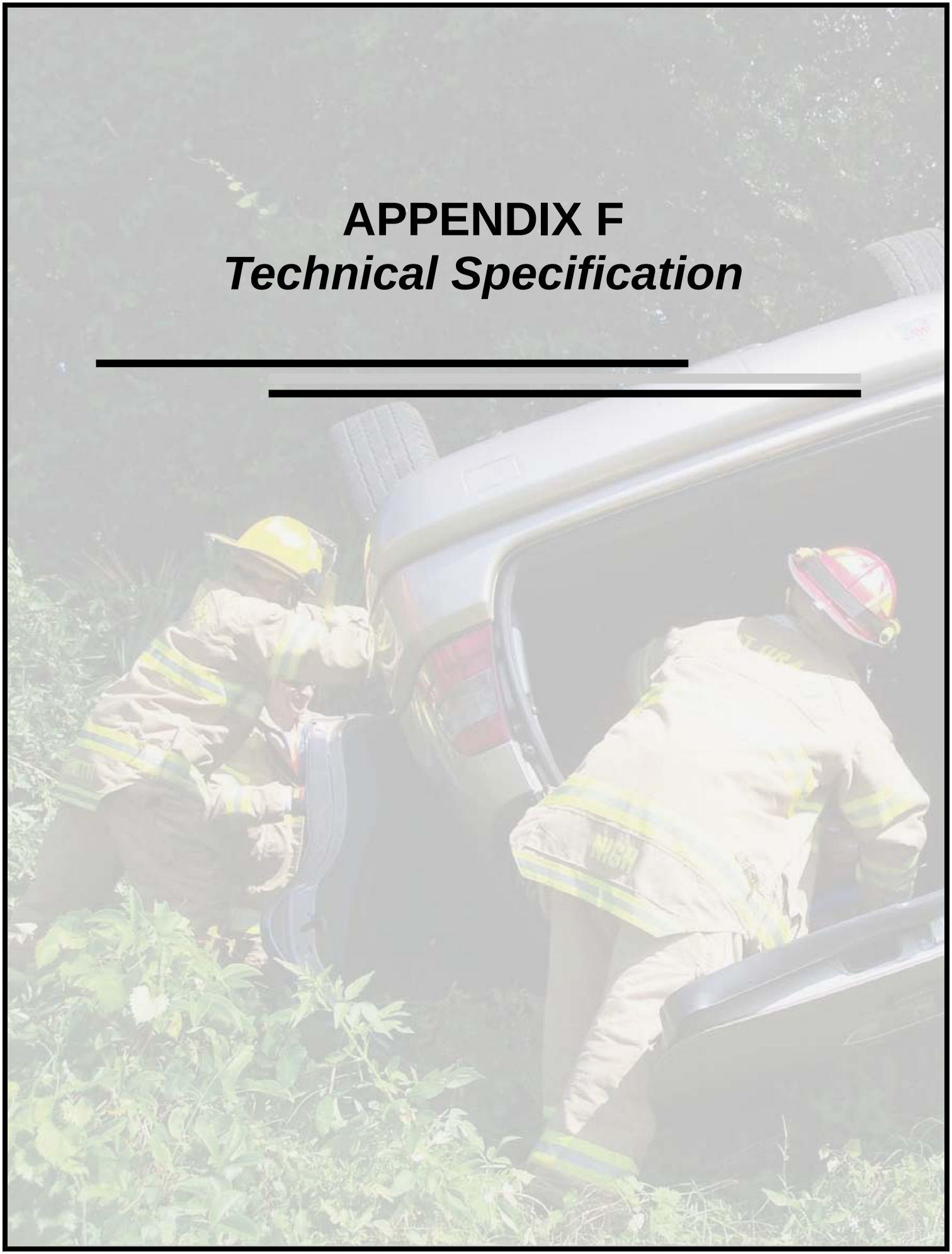
Jim McCroskey, Assistant City Manager
City of Daytona Beach Shores
2990 S. Atlantic Avenue
Daytona Beach Shores, FL 32118
Bus: (386) 763-5353
Email: jmccroskey@cityofdbs.org

Committee Members

Meeting Attendance and Participation

	Kick Off Meeting	4/22/09 Meeting	5/18/09 Meeting	Provided Data
Gary Hughes		X	X	X
Robert Staples		X	X	X
Thomas Weber		X	X	X
Ken Burgman		X	X	X
Skip Irby		X	X	X
Herb Hoffman				X
Tim Hawver		X	X	X
Stephan Cousins		X	X	X
Stephan Dimbinsky				X
Ron Spencer		X	X	X
John McDaniel		X	X	X
Dan Scales		X		
Tad Derr		X		X
Kathy Weaver		X	X	X
Robert Keeth	X		X	X
Jon Cheney	X			X
Garry Lester	X			X
Fred Ferrell	X	X	X	
Mark Mathes	X	X	X	
Mike Marcum			X	
Rick Morrow			X	
Jim Stroz			X	
Keith Riger				
Mike Hill				
Dave Denny				
Paul Johnson				
John Noble				
Khalid Resheidat				
Mark Juliano				
Kieth Gunter				
Chris Hurst				
Anthony Gonzalez				
Jim McCroskey				

APPENDIX F
Technical Specification



Technical Specification
Traffic Signal Preemption and Priority Control System
(Radio activated/GPS based)

Preface: The following technical specification was developed based on information provided from the web site of the recommended device (Global Traffic Technologies), with minor modifications. All devices proposed for use must be compatible with the recommended priority control system and meet these minimum requirements along with being capable of utilization within the same system without the installation of additional vehicle or intersection equipment.

I. System Description

The required priority control system will employ data-encoded radio communication to identify the presence of designated priority vehicles. A record of system users by agency identification number, vehicle classification and vehicle identification number will be created. In priority vehicle mode, the data-encoded communication will request the traffic signal controller to advance to and/or hold a desired traffic signal display selected from phases normally available.

The priority control system will consist of a matched system of vehicle equipment and intersection equipment. The vehicle equipment includes a radio, processor board, and GPS receiver contained in one unit, a GPS antenna and a radio antenna contained in one module, cable, system software, and a vehicle control unit in a separate module. The intersection equipment includes a radio, radio antenna, GPS receiver, and GPS antenna contained in one module, cable, phase selectors and system software.

The GPS receiver on the vehicle will obtain vehicle location, heading and speed from the U.S. Department of Defense (DoD) operated satellites. The vehicle equipment will also monitor the vehicle's turn signal status. A 2.4 GHz spread spectrum/frequency hopping radio in the vehicle equipment will transmit this data to nearby intersections, only when it is within radio communication range of an intersection, which is received by a similar radio located at the intersection. The vehicle radio will communicate to intersection radios at distances up to at least 2,500 feet (762 m) with no obstructions. The intersection radios will communicate to vehicles and other intersection radios at distances of up to at least 2,500 feet (762m) with no obstructions. The phase selector will process the vehicle information to ensure that the vehicle is (1) in a predefined approach corridor, (2) heading toward the intersection, (3) requesting priority, and (4) within user-settable range. If these conditions are met, the phase selector will generate a priority control request to the traffic controller for the approaching priority vehicle. If the approaching vehicle has an active turn signal, the approach intersection will relay the priority request to the next nearest in-range intersection in the direction of the approaching vehicle's turn signal. The output of the phase selector may also be varied depending on the state of the approaching vehicle's turn signal.

The system will require no action from the vehicle operator other than to turn on the vehicle equipment. A remote activation line will be provided so that activation may happen at the same time as the driver activates other equipment such as a lightbar. The system will operate on a first-come, first-served basis. High priority requests will override Low priority requests. The system will interface with most traffic signal controllers and will not compromise normal operation or existing safety provisions.

Automatic deactivation of vehicle priority control system device upon arriving at the scene must be included that involves no action of the vehicle driver. This can be completed by wiring the device to features of the vehicle (such as the parking brake) or other automated means as proposed by the vendor.

II. Matched System Components

The required priority control system will be comprised of seven basic matched components: vehicle/intersection radio/GPS module, vehicle control module, vehicle/intersection radio/GPS antenna, intersection only radio/GPS module, radio/GPS cable, phase selector and system software. In addition, a card rack, an interface panel with additional outputs and an auxiliary harness will be available if required. To ensure system integrity, operation and compatibility, all components will be from the same manufacturer. The system will offer compatibility with most signal controllers, e.g. NEMA (National Electrical Manufacturers Association), 170. The system can be interfaced with most globally available controllers using the controller's preemption inputs. An RS-232 interface shall also be available.

A. Vehicle/Intersection radio/GPS module, Radio/GPS Antenna, and vehicle control unit. The radio/GPS module will obtain the vehicle position, speed and heading information and transmit this information only when within range of a GPS intersection. The vehicle control unit will communicate with the radio/GPS module and provide the interface to the vehicle in order to monitor the vehicle's turn signal status, provide activation and disable inputs as well as regulate the vehicle power provided to the radio/GPS module.

B. Intersection Radio/GPS Module. The intersection radio/GPS module will transmit a beacon every second and receive the data transmitted by the vehicle equipment and relay this information to the phase selector as well as other system-equipped intersections. It will also obtain position information from the GPS satellites.

C. Radio/GPS Cable. The radio/GPS cable will carry the data received from the intersection radio/GPS unit to the phase selector. It will also carry the power for the radio and GPS components provided by the phase selector. The same cable will be used to carry the data between the vehicle radio/GPS unit and the vehicle control unit.

D. Phase Selector. The phase selector will process the data in order to validate that all parameters required for granting a priority request are met. It will be located within the controller cabinet at the intersection. It will request the controller to provide priority to a valid priority vehicle by connecting its outputs to the traffic controller's preemption inputs.

E. System Software. The system software will operate Windows™ 2000 or XP and Internet Explorer V5.5 or later compliant program. It supports system configuration and gathering of operational information.

F. Card Rack. The card rack will provide simplified installation of a phase selector into controller cabinets that do not already have a suitable card rack. The card rack will provide the +24 VDC required to operate the phase selector.

G. Auxiliary Interface Panel/Harness. The auxiliary panel will provide additional preemption outputs if needed. It will also provide a connection point for the phase selector to monitor the status of the intersection's green lights (green sense). Additional communication ports may also be accessed via this panel.

If additional outputs are not required, an auxiliary harness will be used to monitor the status of the

intersection's green lights.

III. System Component Specifications

A. Vehicle/Intersection Radio/GPS Module Radio/GPS Antenna and Vehicle Control Unit

1. A GPS receiver and antenna will obtain the vehicle position, speed and heading from the GPS satellite system operated by the DoD. The time information from the GPS satellites will also be used to synchronize the frequency hopping of the 2.4 GHz radio.

2. A 2.4 GHz spread spectrum/frequency hopping radio will provide the communications from the vehicle to the intersection when within range of an GPS intersection. The radio shall have a transmit power of not more than 1 watt. The radio shall have an unobstructed range of at least 2,500 feet (762 m). The radio will meet FCC Part 15 rules.

3. The Vehicle Control Unit will provide the interface between the vehicle and the priority control system. The vehicle control unit will also interface with the radio/GPS module. The vehicle control unit will monitor the status of the vehicle turn signal via an interface cable that will connect between the vehicle control unit and the left and right turn signal lines in the vehicle. The vehicle control unit will also monitor the disable input line as well as the remote activation input. Power to the vehicle equipment will be provided through the vehicle control unit.

4. The Vehicle Control Unit will have dimensions of no greater than 5.5 inches (14.0cm) wide by 1.75 inches (4.4 cm) high by 5.75 inches (14.6 cm) deep.

5. The radio/GPS module will have dimensions of no greater than 4.5 inches (11.4 cm) wide by 2.75 inches (7.0 cm) high by 8.0 inches (20.3cm) long. This module may also be used in the intersection.

6. The radio/GPS antenna will be a hemispherical dome with a height of 1.43" (3.6 cm) a diameter of 2.85" (7.2 cm) with a pair of 15' (4.6m) cables for the GPS signal and the radio signal. This antenna (along with the radio/GPS module described in paragraph 5 above) may also be used in the intersection.

7. The radio/GPS module will be housed in extruded aluminum housing.

8. The vehicle equipment will be supplied complete with a 20-foot (6.1m)(or longer) installation cable as well as a 15-foot (4.5m)(or longer) vehicle interface cable.

9. The vehicle will transmit the following information when within range of an equipped intersection:

    a. The priority level of the vehicle equipment. This will be either high priority or low priority. The priority level will be factory set. The High priority model will have the option to be wired to operate as low priority either permanently or temporarily.
    b. The agency ID, vehicle classification ID and vehicle ID of the vehicle. Setting these ID numbers will be accomplished through programming software. Each vehicle control unit will be capable of setting 254 different agency IDs and 15 different

vehicle type classifications with 9,999 different identification numbers per class for a total of 38,096,190 codes per priority level.

c. The location, speed and heading of the vehicle.

d. The status of the vehicle's turn signal.

e. The radio channel as assigned by the intersection and the serial number of the vehicle control unit.

10. The vehicle control unit includes multi-purpose communication ports compliant with the RS-232 communication standard. These ports enable unit configuration to be set into the vehicle control unit and read from vehicle control unit. It also allows real-time communication between the vehicle control unit and the interface computer as well as interfacing with other devices. One of the ports may be configured to output GPS data at a user selectable baud rate in the NEMA format while the vehicle control unit is turned on. It will output the following messages (depending on the baud rate):
    a. GGA Global Positioning System Fix Data (2400 baud and higher)
    b. GSA GPS DOP and active satellites (2400 baud and higher)
    c. GSV Satellites in view (4800 baud and higher)
    d. RMC Recommended Minimum Navigation Information (1200 baud and higher)

11. The vehicle control unit will be equipped with an ON/OFF switch to activate the system and request priority. The switch will be depressed to activate the system. In addition, a remote activation line is provided to interface with other vehicle equipment. This line must have a +12 VDC applied to request priority.

12. The vehicle control unit will also have a series of indicator lights that will operate as follows:

    a. A power indicator as well as an indicator light in the switch will indicate that the equipment is powered on.

    b. A GPS indicator will indicate the status of GPS reception. An amber indication means that GPS has not been acquired and that the radio is not "on the air." A green indication means that GPS has been acquired.

    c. A radio indicator will indicate the status of the communication between the vehicle control unit and the radio/GPS unit. An amber indication means that there is no communication and a green indication means that there is communication between the vehicle control unit and the radio/GPS unit.

    d. A disable indicator will indicate if the vehicle equipment is in a disable mode. The disable indicator and the indicator in the power switch will flash green at a rate of 2 Hz.

13. The vehicle control unit will be equipped with a disable input that, when activated, will cause the radio to transmit that the vehicle is in disable mode, thereby eliminating the possibility of the priority request continuing after the priority vehicle has arrived at its destination. The

disable input will be programmable to operate in either a latching or non-latching mode. The disable input will be programmed so that the input may transition from +12 VDC to ground or from ground to +12 VDC. Operation of the disable input will be programmable using software.

14. The vehicle equipment will operate over a temperature range of –30º F (-34º C) to 165º F (+74º C).

15. The vehicle equipment will operate over a relative humidity range of 5% to 95%.

16. Windows™ based software will be available for programming the vehicle control unit through its RS-232 compatible multi-purpose port. The communication protocol will be made available upon request for creating software to implement real-time communication.

B. Intersection Radio/GPS Module

1. A GPS receiver and antenna will obtain the intersection position from the GPS satellite system operated by the DoD. The time information from the GPS satellites will be used to synchronize the frequency hopping of the 2.4 GHz radio and to time stamp the activity log. The GPS receiver and the GPS antenna will reside inside of the radio/GPS module.

2. A 2.4 GHz spread spectrum/frequency hopping radio will provide the communications from the intersection to the vehicle as well as from intersection to intersection. The radio shall have a maximum transmit power of not more than 1 watt. The radio shall have an unobstructed range of at least 2,500 feet (762 m). The radio will meet FCC Part 15 rules. The radio and the radio antenna will reside inside of the radio/GPS module.

3. The radio/GPS module will be housed in a white, impact resistant polycarbonate housing that will include a water resistant wire entry point. It will contain a water resistant access cover to facilitate cable termination. (See section 6 below)

4. The radio/GPS module will be designed for mounting at or near an intersection on mast arms and span wire poles. Additional hardware may be needed.

5. The radio/GPS module will communicate to the phase selector via a radio/GPS cable up to 250 feet (76 m) in length.

6. As an alternate the radio/GPS unit and radio GPS antenna described in Section lll Subsection A, paragraphs five through eight, may be used in the intersection.

C. Radio/GPS Cable

1. The radio/GPS cable will deliver sufficient power from the phase selector to the radio/GPS module and will deliver the necessary quality signal from the radio/GPS module to the phase selector over a non-spliced distance of 250 feet (76 m).

2. The radio/GPS cable will deliver sufficient power from the vehicle control unit to the radio/GPS module and will deliver the necessary quality signal from the radio/GPS module to the vehicle control unit over a non-spliced distance of 50 feet (15 m).

3. The cable will be of durable construction to satisfy the following installations:

    a. Direct burial.

    b. Conduit and mast arm.

    c. Exposed overhead (supported by messenger wire).

4. The outside diameter of the detector cable will not exceed 0.4 inches (10.16 mm).

5. The insulation rating of the detector cable will be 300 volts minimum.

6. The temperature rating of the detector cable will be +194ºF (+90ºC) minimum.

7. The conductors will be AWG #20 (7x28) stranded and individually tinned. The cable will be shielded and have a drain wire to provide signal integrity and transient protection.

8. The radio/GPS cable wires shall be color coded as follows:

    a. Yellow/Yellow-Black dot for Radio transmit.

    b. Blue/Blue-White dot for Radio receive.

    c. Orange/Orange-Green dot for Radio clock.

    d. Brown/Brown-White dot for GPS power and common.

    e. Violet/Violet-White dot for Radio power and common.

    f. Bare for shield drain.

9. When the aluminum enclosure version of the radio/GPS module is used, a radio/GPS cable assembly using the above cable with a 15-pin connector that will mate with the connector on the radio/GPS module will be used.

D. Phase Selector

1. The phase selector is designed to be installed in the traffic controller cabinet and is intended for use directly with numerous controllers. These include California/New York Type 170 controllers with compatible software, NEMA controllers, or other controllers along with the system card rack and suitable interface equipment and controller software.

2. The phase selector will be a plug-in, four channel, multiple-priority device intended to be installed directly into a card rack located within the controller cabinet.

3. The phase selector will be powered from +24 VDC.

4. Programming the phase selector and retrieving the data stored in it will be accomplished using an IBM™ PC-compatible computer and the system interface software. The connection can be direct via the computer's communication (COM) port. The communication ports on the phase selector will be RS-232 ports located on the front and

back of the unit. Additional communication ports are available using the Auxiliary Interface Panel. The communication protocol will be made available upon request for creating software to implement other communication applications.

5. The phase selector will include the ability to directly sense the green traffic controller signal indications through the use of dedicated sensing circuits and wires connected directly to field wire termination points in the traffic controller cabinet. This connection will be made using either the auxiliary interface panel or the auxiliary harness.

6. The phase selector will have the capability of storing up to 10,000 of the most recent priority control calls. When the log is full, the phase selector will drop the oldest entry to accommodate the new entry. The phase selector will store the record in non-volatile memory and will retain the record if power terminates. Each record entry will include the following points of information about the priority call:

    a. Agency: Indicates the operating agency of the vehicle.

    b. Classification: Indicates the class type of vehicle.

    c. Identification number: Indicates the unique ID number of the vehicle.

    d. Priority level: Indicates the vehicle's priority level (High or Low priority).

    e. Direction: Channel A, B, C, or D; indicates the vehicle's direction of travel.

    f. Call duration: Indicates the total time in seconds the priority status is active.

    g. Final greens at end of call: Indicates which phases are green at the end of the call.

    h. Duration of the final greens: Indicates the total time final greens were active at the end of call.

    i. Time and date call started and ended: Indicates the time a priority call started and ended, provided in seconds, minutes, hours, day, month, year.

    j. Turn signal status: Indicates the status of the turn signal at the beginning of the hold time.

    k. Priority output active: Indicates if the phase selector requested priority from the controller for the call.

    l. Historical no preempt cause: Indicates a history of conditions, which may have prevented a call.

7. The phase selector will include several control timers that will limit or modify the duration of a priority control condition, by channel, and can be programmed from an IBM™ PC-compatible computer. The control timers will be as follows:

    a. MAX CALL TIME: Will set the maximum time a channel is allowed to be held active by a specific vehicle. It will be settable from 60 to 65,535 seconds in one-second

increments. The factory default shall be 360 seconds.

b. OFF APPROACH CALL HOLD TIME: Will set the time a call is held on a channel after the vehicle has left the approach. It will be settable from four to 255 seconds in one-second increments. Its factory default shall be six seconds.

c. LOST SIGNAL CALL HOLD TIME: Will set the time a call is held on a channel after the intersection has lost contact with the vehicle. It will be settable from one to 255 seconds in one-second increments. Its factory default shall be six seconds.

8. The phase selector shall have the ability to enable or disable all calls of both priority levels. This shall be settable independently by channel.

9. A unique intersection name, which will be broadcasted, shall be settable for each phase selector.

10. Up to 25 different radio channels will be available to be assigned to the phase selector.

11. The phase selector will have the option of operating in a mode that will vary the output based on the status of the approaching vehicles turn signal. Additional outputs available on an Auxiliary Interface Panel may be needed. Settings will be available for this mode as follows:

    a. Output mappings for each channel.

    b. Separate setting for each of the four channels.

    c. Separate settings for each Left turn, right turn or straight signal status for each of the above four channels.

12. The phase selector's default values will be re-settable by the operator using an IBM™ PC-compatible computer.

13. The phase selector will be capable of two levels of signal discrimination, as follows:

    a. Verification of the presence of the signal of either High priority or Low priority.

    b. Verification that the vehicle is approaching the intersection.

    c. Determination of when the vehicle is within the prescribed range.

14. The phase selector will include one opto-isolated NPN output per channel that provides the following electrical signal to the appropriate pin on the card edge connector:

    a. 6.25Hz ± 0.1Hz 50% on/duty square wave in response to a Low priority call.

    b. A steady ON in response to a High priority call.

    c. The phase selector will also have the option of providing separate outputs for High and Low priority calls for controllers that do not recognize a 6.25 Hz pulsed Low

priority request.

d. Additional outputs will also be available on the auxiliary interface panel.

15. The phase selector will accommodate two methods for setting range thresholds for High and Low priority signals:

    a. Based on the approaching vehicle's Estimated Time of Arrival (ETA). This will be settable between 0 and 255 seconds. The factory default will be 30 seconds. The ETA threshold will be independently settable by each of the following parameters; vehicle class, channel and priority level.

    b. Based on the approaching vehicle's distance from the intersection. This will be settable between 0 and 5000 feet. The factory default will be 1000 feet. The Distance threshold will be independently settable by each of the following parameters; vehicle class, channel and priority level.

    c. Input of the range requirements will be done via the communication port and configuration software.

16. The phase selector will have a POWER ON LED indicator that illuminates steadily to indicate proper operation.

17. A GPS indicator will indicate the status of GPS reception. An amber indication will mean that a GPS signal has not been acquired and that the radio is not "on the air." A green indication will mean that a GPS signal has been acquired.

18. A radio indicator will indicate the status of the communication between the vehicle control unit and the radio/GPS unit. An amber indication will mean that there is no communication and a green indication will mean that there is no communication between the vehicle control unit and the radio/GPS unit.

19. The phase selector will have a two-color LED indicator (green for High priority, amber for Low priority) for each channel to display active calls.

20. The phase selector will have a test switch for each channel to test proper operation of High or Low priority.

21. The phase selector will relay a priority request to the next adjacent intersection based on the intended direction as indicated by the vehicle's turn signal.

22. The phase selector will utilize the time obtained from the GPS satellites to time stamp the activity logs. The user will set the local time zone (offset from GPS time) via the interface software.

23. The interface software will have the capability to set the phase selector to automatically adjust the GPS time offset for changes in daylight savings time.

24. An auxiliary interface panel will be available to facilitate interconnections between the phase selector and traffic cabinet wiring as well as provide additional outputs.

25. The phase selector includes multi-purpose communication ports compliant with the RS-232 communication standard. These ports enable unit configuration to be set into the phase selector unit and read from phase selector. It also allows real-time communication between the phase selector and the interface computer as well as interfacing with other devices. One of the ports may be configured to output GPS data at a user selectable baud rate in the NEMA format while the vehicle control unit is turned on. It will output the following messages (depending on the baud rate):
    a. GGA Global Positioning System Fix Data (2400 baud and higher)
    b. GSA GPS DOP and active satellites (2400 baud and higher)
    c. GSV Satellites in view (4800 baud and higher)
    d. RMC Recommended Minimum Navigation Information (1200 baud and higher)

E. Card Rack

1. The required card rack will provide simplified installation of a phase selector into controller cabinets that do not already have a suitable card rack.

2. The card rack will be factory wired with one connector, located behind the card slot, a power supply inside the card rack and one connector on the front of the card rack.

3. The card rack connector on the front will provide for connections to the traffic controller.

4. The card rack will contain a 24 VDC power supply to power the phase selector.

F. Interface Software

1. The priority control interface software will be provided on a single CD-ROM to interface with the phase selector. It must run on most IBM™-compatible computers equipped with at least 64MB RAM, Windows™ 2000 or XP and Internet Explorer™ 5.5 or higher and color VGA display capability.

2. The priority control interface software must accommodate:

    a. Setting up and presenting user-determined system parameters.

    b. Configuring approach maps.

    c. Viewing vehicle activity screens.

    d. Displaying and/or downloading records of previous activity showing class, code, priority, direction, call duration, final greens at end of call, duration of final greens, time call ended in real time plus maximum signal intensity (vehicle location information). This information may be used to reconstruct the route taken by a priority vehicle to track the vehicle.

3. The priority control interface software must accommodate operation via a mouse or via the keyboard, or in combination.

4. The priority control interface software must provide menu displays to enable:

a. Setting of valid vehicle ID and class codes.

b. Establishing detection ranges, modem initialization, intersection name and timing parameters.

c. Resetting and/or retrieving logged data and priority vehicle activity.

d. Saving and retrieving vehicle and intersection configuration data, and printing, saving and viewing configuration data in html format.

e. A mapping module to facilitate creation and saving of intersection approach maps.

f. User driven context online help.

g. Ability to upgrade vehicle, intersection and radio firmware.

5. The interface software shall provide a real-time activity screen that will display the following information about tracked vehicles.

    a. The approach channel.

    b. Vehicle class and ID and agency ID.

    c. Priority level.

    d. Historical no preempt cause.

    e. Turn signal status

    f. Signal strength serial number and radio channel.

    g. Priority output and preempt status.

    h. ETA, distance, heading and velocity of vehicles in approach corridor.

    i. Source of the call vehicle or intersection.

    j. Green phase monitoring with information on the current greens.

6. Additional screens that provide the following information about all intersections in range shall be provided.

a. Name	b. Radio channel
c. Signal strength	d. Number of vehicle tracked
e. Satellites heard	f. Fix type
g. Horizontal and position dilution	h. Serial number

IV. Reliability

A. All equipment supplied as part of the radio/GPS priority control system intended for use in the controller cabinet will meet the following electrical and environmental specifications spelled out in the NEMA Standards Publication TS2 1992, Part 2:

1. Line voltage variations per NEMA TS2 1992, Paragraph 2.1.2.
2. Power source frequency per NEMA TS2 1992, Paragraph 2.1.3.
3. Power source noise transients per NEMA TS2 1992, Paragraph 2.1.6.1.
4. Temperature range per NEMA TS2 1992, Paragraph 2.1.5.1.
5. Humidity per NEMA TS2 1992, Paragraph 2.1.5.2.
6. Shock test per NEMA TS2 1992, Paragraph 3.13.9.
7. Vibration per NEMA TS2 1992, Paragraph 3.13.8.

B. Each piece of equipment supplied as part of the priority control system intended for use in or on priority vehicles will operate properly across the entire spectrum of combinations of environmental conditions (temperature range, relative humidity, vehicle battery voltage) per the individual component specifications.

V. Qualifications

A. The manufacturer of the required priority control system will verify the proven, safe operation of the system's technology through current examples of installed priority control systems. Upon request, the manufacturer will produce a list of user agencies having experience interfacing priority control equipment with programmable controller types.

B. The manufacturer product(s) must be on the current Florida Department of Transportation Approved Products List.

VI. Responsibilities

A. The manufacturer of the required priority control system and/or the manufacturer's representative will provide responsive service before, during and after installation of the priority control system. The manufacturer and/or the manufacturer's representative, as consultants to the installer, will provide certified, training technicians having traffic systems industry experience and operational knowledge of priority control systems.

VII. Substantiated Warranty

A. The manufacturer of the required priority control system will warrant that, provided the priority control system has been properly installed, operated and maintained, component parts of a matched component system (see Section II) that prove to be defective in workmanship and/or

material during the first two (2) years from the date of shipment from the manufacturer will be covered in a documented system-protection plan.

B. The protection plan will warrant that component parts of a matched component system that are not subject to coverage limitations and prove to be defective in workmanship and/or materials during the first two (2) years from the date of shipment from manufacturer will be repaired at no charge.

C. In total, the warranty/maintenance coverage must assure that system components will be available to allow system operation during the two (2) year warranty/maintenance coverage.

D. A copy of the manufacturer's written warranty outlining the conditions stated above will be supplied with the bid. Coverage and coverage limitations are to be administered as detailed in the manufacturer's Warranty/Maintenance document.

E. This warranty can be overridden by the bidding governmental agency requirements as shown in the bid documents.

VIII. Certificate of Insurance

The manufacturer of the required priority control system will provide a certificate of product liability insurance protection for $5,000,000 assuring the priority control user that the manufacturer is insured against civil damages if proven to be at fault for an accident due to equipment failure within the system of matched priority control components. This certificate, however, need not, and is not meant to, provide liability insurance protection to the priority control system dealer, installer or user.

IX. User Support Services

The manufacturer of the required priority control system will offer support programs to assist the purchase and implementation of a priority control system program, including:

A. Public relations assistance to promote the system within the user community.
B. Intersection survey service to document appropriate equipment interfaces.
C. Customized proposals to assist the procurement process.
D. Driver Training Program

X. Certification

The manufacturer of the required GPS priority control system will certify that all component products are designed, manufactured and tested as a system of matched components and will meet or exceed the requirements of this specification.

XI. Patent Infringement

Prior to using any priority control system device(s), user represents use of the products as contemplated herein does not and will not infringe any patent, copyright, or other proprietary right of any third party.

XII. Use of Intellectual Property

Prior to using any priority control system device(s), user represents that it has secured all necessary licenses, consents or approvals to use the components of any intellectual property from the vendor.