City of Jonesboro

Invitation to Bid - Not an Order

P.O. Box 1845

300 South Church St. Rm 421 (72401)

Purchasing Office

Bid No. 2014:22

Jonesboro, Arkansas 72403

Date June 13, 2014

Sealed bids, subject to the conditions on the reverse hereof, and as may be attached hereto, will be received at this office until **2:00pm Wed. July 2, 2014** and then publicly opened, for furnishing the supplies, materials and/or services as described below and tabulated for presentation to the City Council on 7/14 ~ 7/15 Am

F.O.B City of Jonesboro

Maximum Delivery or completion time after issuance of Purchase Order or work ordered by the City n/a days.

By: **Steve A. Kent**
Purchasing Agent
(870)932-0740

Item #	Description	Quantity	Unit	Unit Price	Amount
	SCOPE:				
	Furnish GPS Emergency preemption equipment & vehicle management software to the City of Jonesboro. As per attached specifications.				
1.	GPS Preemption Equipment & Management Software as per specs	1	EA	$84,250.00	$84,250.00
2.	Intersection installation	18	EA	$ 0	$ 0
3.	Vehicle installation	72	EA	$ 0	$ 0
	Please state manufacturer Global Traffic Technologies, inc				
	Please state warranty on equipment & software: 5 years from ship date				
	NOTE: An aerial map of impacted intersections may be obtained by going to the purchasing web site at www.jonesboro.org.				
	Many of the equipment and vendor specifications, such variation(s) must be listed in writing and attached as part of the bid proposal. The City of Jonesboro reserves the right to waive minor variance(s) if in the opinion of the Engineering Department that the basic bid meets the general intent of these specifications.				
	Bid number (2014:22) must be annotated on the outside of bidder's envelope.				
	The City of Jonesboro reserves the right to accept or reject any and/or any part of any bid received.				
	Bid must be signed or bid will be rejected.				
	Please check www.jonesboro.org and click on Purchasing for any addendums up to one week before bid opening.				
	Vendor's email address: brad.white@temple-inc.com				
	Bid opening will be in Conference Room #109 if bidder is attending.				
	Cash Discounts ____ % ____ Days				

Execution of Bid

Date 7/1/2014

We, the undersigned, have read all the requirements set forth in this bid proposal including specification, instructions, conditions and pertinent information regarding the articles being bid on, and we agree to furnish articles at the prices stated

Arkansas Use Tax Register No. 00155243 Phone # (256) 353-3620

Bidder Temple Inc Address P.O. Box 2066

By Brad White Sales Rep City Decatur, AL 35601

(Person Authorized to Sign Bids) (Title)

Unsigned Bids Will Be Rejected

Bids number MUST be annotated on Bidder's envelope.
Bids are subject to rejection unless submitted on this form.
Notice to bidders: See reverse side for instructions and conditions.

CITY OF JONESBORO, ARKANSAS

CONDITIONS OF BIDDING

COMPLIANCE WITH THE FOLLOWING CONDITIONS IS NECESSARY FOR CONSIDERATION OF THIS BID:

1. ***SIGNATURE*** - This bid must be signed with the firm name and by an authorized officer, employee, or agent.
2. ***SALES OR USE TAX*** - is not to be shown in the bid price (unless otherwise stated) but is to be added by the vendor to the invoice billing to the City. The City is not exempt from Arkansas State Sales & Use Tax. Although Use Tax is not included in this bid, vendors are to register and pay tax direct to the Arkansas State Revenue Department.
3. ***FREIGHT & OTHER DELIVERY CHARGES*** - to designated City facility in Jonesboro must be included in bid. Charges may not be added after the bid is opened.
4. ***DISCOUNTS*** - Show rate, total amount, and latest day any discounts will be allowed after receipt of article and invoice, otherwise City will deduct allowed discount when payment is made.
5. ***FIRM PRICE*** - All prices quoted will remain firm for at least 30 days from date of bid, unless otherwise specified by the City or bidder.
6. ***IDENTICAL BIDS*** - In the event of two or more identical low bids, the contract may be awarded arbitrarily or for any reason to any of such bidders or split in any proportion between the said two or more bidders at the discretion of City.
7. ***LIQUIDATED DAMAGES*** - Liquidated damages shall be assessed beginning on the first day following the maximum delivery or completion time entered on this bid form and/or provided for by the plans and specifications.
8. ***AMBIGUITY IN BID*** - Any ambiguity in any bid as the result of omission, error, lack of clarity or non-compliance by the bidder with specifications, instructions, and all conditions of bidding shall be construed in the light most favorable to the City.
9. ***CONSTRUCTION*** -
   A. When noted, the Contractor is to supply the City with evidence of having and maintaining proper and complete insurance, specifically Workman's Compensation Insurance in accordance with the laws of the State of Arkansas, Public Liability and Property Damage. All premiums and cost shall be paid by the Contractor. In no way will the City be responsible in case of accidents.
   B. When noted, a Certified check or bid bond in the amount of 5% of total bid shall accompany bid.
   C. A performance Bond equaling the total amount of any bid exceeding $3,000.00 must be provided for any contract for the repair, alteration or erection of any public building, public structure or public improvement (pursuant to Ark. Stat. 5851-632.5851-565 as amended.)
10. The City reserves the right to reject any and all bids, to accept in whole or in part, to waive any informalities in bids received, to accept bids on materials or equipment with variations from specifications in those cases where efficiency of operation will not be impaired, and unless otherwise specified by the bidder, to accept any item in the bid. If unit prices and extensions thereof do not coincide, the City may accept the bid for the lesser amount whether reflected by the extension or by the correct multiple of the unit price.
11. Minority Business Policy - It is the policy of the City of Jonesboro that minority business enterprises shall have the maximum opportunity to participate in the city purchasing process. Therefore, the City of Jonesboro encourages all minority businesses to compete for, win and receive contracts for goods, services, and construction. The city also encourages all companies to subcontract portions of any city contract to minority business enterprises.

INSTRUCTIONS TO BIDDERS

(PLEASE READ CAREFULLY)

1. Submit bid on bid form on reverse side of this sheet. NO Facsimiles will be accepted.
2. Address all bids to: Purchasing Agent, P.O. Box 1845, Jonesboro, Arkansas 72403-1845 and make certain to indicate identifying bid number on the outside of bidder's envelope.
3. DO NOT include Federal Excise Tax in bid. City will furnish exemption certificate.
4. State Manufacturer, Brand Name, Model, etc for each item bid on.
5. Samples of items, when required, must be furnished free, and, if not called for within 30 days from date of bid opening, will be disposed of by City
6. Bids received after stated time will not be considered
7. Be sure and read all conditions and verify amounts before submitting bids. No changes or additions will be allowed after submission.
8. Guarantees and warranties should be attached as a part of the bid as they may be a consideration in awarding a contract.
9. Delivery or contract completion time is to be shown, as this date may, where time is of the essence, determine the contract award.
10. Additional information may be obtained from the Purchasing Office.

THE CITY RESERVES THE RIGHT TO ACCEPT PART OR ALL OF ANY SPECIFIC BID OR BIDS AND TO ACCEPT ANY BID WITH OR WITHOUT TRADE-IN. THE CITY FURTHER RESERVES THE RIGHT TO REJECT ALL BIDS, OR PART OR ALL OF ANY SPECIFIC BID OR BIDS.

Click on Purchasing at www.jonesboro.org for any additional information.

Special Provision GPS emergency preemption equipment & central management software

1. Description

This item shall include GPS based emergency preemption equipment and Central Management Software with the specifications outlined in this separate line items for intersection equipment and emergency vehicle equipment. Software and equipment training shall be considered subsidiary to the equipment cost. The number of intersections and vehicles are indicated below:

Traffic Signals: 18 Vehicles: 12

2. Component Specifications

A. The Central Management Software shall include the following features:

Create and manage device event reports
Log changes to control settings with a time stamp
Remotely update firmware to field upgradable equipment
Provide a vehicle ID with each event
Shall have the ability to implement event evacuation plans

B. The Intersection Components shall include the following features:

Remote antenna located on the traffic signal mast arm allowing for 360 degree reception and transmission with applicable cable and mounting hardware
Ethernet based rack or shelf mounted selector/detector unit that logs the following information:
Location Name
Vehicle ID
Channel Enabled
Green Signal Indications Displayed
Length of Event
Average speed of enabling vehicle
Card rack (if required)
Auxiliary Interface Panel (if required)
All applicable connectors and jumpers

C. The Vehicle Equipment shall include the following features:
GPS Control Unit
GPS Antenna with applicable cables and connectors
Vehicle Interface Cable
Vehicle Hardware Installation Kit

3. Product Presentation

As part of the selection process, a representative from each bidder shall give a product presentation. The presentation shall cover the following areas:
Central Management Software capabilities
Intersection components programming and options
Vehicle Equipment programming and options
Procedures for adding additional intersections and vehicles to the existing system in future phases

4. Basis of Payment

Equipment, software and training supplied under this job shall be measured by Lump Sum; which price shall be full compensation for furnishing GPS based preemption equipment for 18 intersections, 12 vehicles, central management software, training and all incidentals necessary to complete the work. Intersection and vehicle installation shall be on separate pay lines (see page 1).

Global Traffic Technologies
Opticom™ System Components

Warranty Coverage

Global Traffic Technologies, LLC ("GTT") offers the following exclusive limited warranty coverage for its Opticom™ System and Components. This warranty is made for the exclusive benefit of the original End User of the Products and shall not accrue to the benefit of any other user, third party or dealer unless otherwise required by law.

Description	Opticom™ System Components Covered: • Intersection Components: 462/464 Phase Selector, 762/764 Phase Selector, 768 Auxiliary Interface Panel, 3100/3101 GPS Radio Unit • Vehicle Components: 792HM/792TM Emitters, 794HM/794TM Emitters, Multimode Vehicle Kit and Multimode Vehicle Upgrade Kit, GPS Vehicle Kit • IntelliGreen
Warranty Period	GTT's Exclusive Limited Warranty shall cover its Opticom™ System for a period of 5 years from the date of shipment by GTT. An additional 5 year extension to GTT's Exclusive Limited Warranty (hereinafter referred to as Extended Warranty) may be purchased either at the time of original order or within 90 days of the expiration date of the first five year period.

Exclusive Limited Warranty: GTT warrants that, during the Warranty Period described above, its Opticom™ System will deliver the same level of system operability and functionality as defined in the published GTT specifications applicable to the version of Components purchased. **THIS WARRANTY CONSTITUTES THE SOLE AND EXCLUSIVE WARRANTY RELATING TO THE OPTICOM™ SYSTEM SOLD OR MANUFACTURED BY GTT. GTT MAKES NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH RESPECT TO ITS OPTICOM™ SYSTEM. GTT SPECIFICALLY EXCLUDES AND DISCLAIMS ALL OTHER WARRANTIES REGARDING ITS OPTICOM™ SYSTEM, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR WARRANTIES ARISING FROM A COURSE OF DEALINGS OR USAGE OF TRADE.**

Warranty Exclusions: This Warranty shall not apply to (A) incandescent lamps (confirmation lamps) or (B) to any defect or impairment of operability or functionality resulting from or caused by: (1) alteration, misuse, incorrect installation, neglect of the System or damage due to accident; (2) repair or modification of the System by persons not authorized by GTT; (3) extreme atmospheric or weather conditions; (4) events or use outside the normal or anticipated course; or (5) improper packaging or damage during shipment by the End User or party other than GTT. In addition, the Opticom™ System integrates an array of matched Components. GTT has designed, developed and tested Opticom™ System Components as part of a matched Component system. To assure system integrity and optimal performance, the emitters, detectors, radios/GPS components, detector cables, phase selectors/discriminators and system software must be GTT Components. The use or integration of any GTT System with any non GTT Component shall void all GTT warranties with respect to such GTT System.

Sale and use of the Opticom™ System is expressly restricted to authorized agencies of government customers, within their specific jurisdictions. However, because the signal generated by the Opticom™ System is not exclusive, GTT does not warrant exclusive activation by purchaser. Authorized users who desire to use or coordinate use of the Opticom™ System with that of other jurisdictions must first obtain the prior written approval of each authorized user in the jurisdiction where use is sought.

Remedies and Limitation of Liability: In the event that any Opticom™ System sold or manufactured by GTT fails to conform to the terms of GTT's Exclusive Limited Warranty as provided herein, the original End User's exclusive remedy shall be limited to return of the non-conforming goods to GTT for repair, replacement, or refund of the purchase price paid for the non-conforming Components, said remedy to be determined by GTT in its sole discretion. The cost of return shipping to GTT is the responsibility of the end user. All claims for non-conformance or breach of warranty shall be deemed waived unless the non-conforming Components are returned to GTT within 30 days of discovery of the alleged non-conformance. **IN NO EVENT SHALL GTT BE LIABLE FOR ANY OTHER INJURY OR DAMAGES, INCLUDING WITHOUT LIMITATION ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES, LOST PROFITS, LOST BUSINESS OPPORTUNITY, LOSS OF GOOD WILL, ATTORNEYS' FEES, DAMAGE TO BUSINESS OR BUSINESS RELATIONSHIPS OR OTHER FORMS OF ECONOMIC LOSS ARISING FROM, CONNECTED WITH, OR RELATING TO GTT'S ACTS OR OMISSIONS, WHETHER FOR BREACH OF WARRANTY, BREACH OR REPUDIATION OF ANY CONTRACTUAL TERM OR LEGAL DUTY IN CONTRACT, TORT, STATUTE OR OTHER THEORY OF LIABILITY.** In addition, because GTT Systems are installed by other parties in a variety of applications, and are used by trained professionals under often extreme emergency conditions, GTT shall not be liable for any personal injury, wrongful death or property damages caused by or arising from any alleged defect, non-conformance, or failure of its Systems to function, operate or perform, whether asserted in warranty, contract, tort or other theory of liability. No action, regardless of form, arising out of or alleging either a breach of any warranty or a breach of any contractual term or legal duty by GTT may be brought more than one year after the cause of action accrues.

Warranty Claim Process: Contact your authorized Opticom™ system dealer, or contact GTT technical service at 1-800-258-4610 or download a warranty & services request form at www.gtt.com.
Outside the United States please contact our headquarters in St. Paul, MN at +1 651-789-7333 for assistance in locating an authorized repair facility servicing your country.

Severability: Should any portion of this Warranty be declared void or otherwise rendered without effect, the remaining provisions of the Warranty shall continue in full force and effect.

February 7, 2014

Global Traffic Technologies, LLC
7800 Third Street North
St. Paul, Minnesota 55128-5441
1-800-258-4610
651-789-7333
www.gtt.com

79-1000-0604-0 D

Global Traffic Technologies

Steve Kent
City of Jonesboro
P.O. Box 1845
300 S Church Street, Room 421
Jonesboro, AR 72401

Dear Mr. Kent:

Thank you for inviting Global Traffic Technologies (GTT) and GTT authorized distributor, Temple Inc., with the opportunity to bid on Project #2014:22 for an emergency vehicle preemption system. The attached bid response is based on GTT's Opticom™ GPS solution as specified in Jonesboro's Invitation to Bid.

Today's Opticom™ products represent over 45 years of continuous innovation. First introduced in the late 1960's, Opticom™ priority control equipment is currently deployed in over 70,000 intersections and 50,000 vehicles in over 3000 customers around the world. We are confident that as you consider the contents in this proposal, that Opticom™ will remain the best choice for Jonesboro.

With this in mind, there are a number of factors we feel differentiate the Opticom™ products and provide exceptional value to Jonesboro:

Commitment to Quality

Emergency Vehicle Preemption (EVP) is a mission critical application. GTT does not take this responsibility lightly. GTT exhaustively tests the Opticom™ products to not only meet functionality requirements, but reliability and regulatory compliance requirements as well. All products are confirmed by independent testing laboratories to meet all applicable NEMA, FCC, UL, CE, and ETSI regulatory requirements. Products also go through thorough accelerated life testing to ensure they will continue to perform to these rigorous specifications over the entire service life of the product. As an ISO 9001 accredited organization, GTT is audited regularly by independent assessors and required to demonstrate a consistent implementation of these testing regimes on all of their products, as defined in their ISO Quality Management System.

While the Opticom™ products offer a comprehensive and competitive warranty, a warranty only provides for equipment replacement, there are still hidden costs to a failure – loss of critical capabilities and the opportunity cost of diverting scarce city resources to troubleshoot and replace failed equipment. One of the hallmarks of the Opticom™ equipment, as a result of GTT's commitment to quality, is a proven track record of performance and reliability. This reliability performance is demonstrated by customer surveys where Opticom™ routinely scores above 95% in customer satisfaction.

Continuous Innovation

GTT spends millions of dollars each year in product development, continually refining the Opticom™ product line. This on-going investment and innovation is demonstrated by both a broad portfolio of U.S.

and international patents covering Infrared (IR), GPS, and Central Management technologies as well as a complete product line providing integrated solutions based on these technologies.

GTT's focus on innovation ensures that you, the customer, always has access to the latest, most reliable technology. The solution presented in this proposal includes many of these innovative technologies – GPS Intersection Kit, GPS Vehicle Kit, Central Management Software (CMS).

Matched Component System Guarantee

In order to guarantee the performance of critical EVP applications, GTT tests all Opticom™ intersection and vehicle components as a Matched Component System, and guarantees their compatibility. This is the only way GTT can guarantee the required level of system performance. Competitors may claim varying degrees of compatibility with Opticom™ equipment, but please note that GTT has not been approached by their competitors to verify compatibility, and they do not endorse mixing different vendors' components. Therefore, any claims of compatibility with GTT's products made by competitors are made without GTT's endorsement, consent, or support. Mixing vendors also places a customer into the role of systems integrator – transferring the responsibility of determining the source of any mix and match issues from the vendors (where it belongs) to that customer. Any damage caused by incompatible equipment also runs the risk of voiding the Opticom™ warranty. The Opticom™ products are purpose designed and built as an integrated system specifically for priority control, and in many cases patented, and GTT has not licensed the manufacturing rights of Opticom™ to others. As such, GTT is the sole source for Opticom™ products for all of our customers.

GPS Solution

This proposal is based on an Opticom™ GPS solution. At the core of the Opticom™ GPS solution is the Model 764 Multimode Phase Selector. The Opticom™ 764 Phase Selector has proven so successful, that over 9,000 have been deployed since being introduced in early 2011. The Opticom™ Multimode Phase Selector represents much more than simply a platform for enabling GPS-based priority control. In addition, the 764 Multimode Phase Selector is also designed to support past (IR), present (IR and GPS) and future technology advances such as the U.S. DOT Connected Mobility initiative utilizing Dedicated Short Range Radio Communication (DSRC), as well as alternate priority control schemes, such as centralized coordination via a third party or an Automatic Traffic Management System. The Opticom™ Multimode Phase Selector is truly designed to protect you priority control investment in the long term.

Centralized Management System (CMS)

Over the past several years GTT has developed a feature-rich Central Management System (CMS) software application. First introduced in 2009, this optional software is used by over 80 agencies in the U.S. and internationally. CMS provides system managers seamless remote management of Opticom™ Priority Control Systems for the traffic, transit, and emergency management departments with the ability to monitor, maintain, and update the Opticom™ system from their desktop. Whether it is automatic notification of anomalies, reports on system usage, fine tuning operation, or activating advanced features such as time plans and evacuation mode, the Opticom™ CMS simplifies the task, and provide cost savings associated with system maintenance. CMS is compatible with both Opticom™ IR and Opticom™ GPS equipment. CMS does not support competitive equipment.

Illegal Emitter Detection

Opticom CMS assists customers with the management of coding plans across multiple agencies and regions to avoid unauthorized users gaining access to the Opticom™ system. CMS offers extensive tools to set-up regional coding plans, administer and track changes, detect unauthorized attempts to use the system, and automatically notifies system administrators of attempted unauthorized usage. CMS also allows the operator to manage Mutual or Automatic aid with any other Opticom™ cities using Opticom™ IR or GPS products. While coding plans can be administered without CMS, the task is greatly simplified with CMS.

Key Opticom™ Features:

System Time Plans:

GTT's Priority control algorithm (resident on the Opticom™ 764 Phase Selector) incorporates the ability to modify priority performance, based on the time of day, day of the week, specific dates, specific vehicles, specific intersections, and/or relative and directional priority. For example priority may be modified in a given direction at specific times of the day (e.g. rush hour) for specific vehicles to create time dependent directional priority control. Time plans may be programmed locally at each phase selector or through the CMS.

Estimated arrival time to the intersection:

Activation of the Opticom™ GPS system is based on an estimated time of arrival (ETA) and/or distance to the intersection. ETA is programmable between 0 and 255 seconds with a default set at 30 seconds. Approach distance from the intersection is settable between 0 and 5000 feet with a factory default of 1000 feet. These thresholds are independently settable by vehicle class, channel and priority level.

Turn Signal Dependent Mode Functionality:

Periodically vehicles utilizing priority control must move out of well-defined lanes (e.g. into a turning lane to get around an obstruction despite the need to go straight, or conversely moving out of a turning lane because of an obstruction and then proceeding to turn). Basing priority control solely on lane position can lead to either false or missed priority activation. To overcome this issue, Opticom™ GPS supports turn signal dependent mode. In this mode, activation of intersections "around the corner" only occurs when a driver indicates a turning movement by means of their left or right turn signal indicator. Similarly, if a vehicle is in a turning lane but has not activated their turn signal, preemption occurs in a forward direction and not around the corner. To perform this look ahead capability, Opticom™ equipped intersections forward vehicle requests to the next intersection on the path based on the vehicle indicators. This relay capability is also useful to start pre-emption early on subsequent intersections in cities with either short blocks or long pedestrian crossing times.

Coding and Mutual Aid:

The Opticom™ system implements security features allowing users to control access and use of the priority control system through use of a regional vehicle coding plan. The system also facilitates the implementation of security across both infrared and GPS/radio technologies used simultaneously in one region.

The Opticom™ system supports mutual aid strategies with Fire/EMS agencies outside the Region while *supporting agencies within the region that have not transitioned vehicle technology from Opticom™ IR* to Opticom™ GPS or Multimode operation.

Benefits of an Intersection Centric System

Priority control systems generally come in two forms – vehicle centric and intersection centric.

In an intersection centric system, most system operational parameters reside at the intersection-based equipment. Modification of an intersection's configuration will apply to all vehicles requesting priority service from said intersection, without the need to modify vehicle information *at all*.

In a vehicle centric system, most system configuration data (e.g. all intersection locations, approach maps, and associated provisioning, etc.) is required to be stored on each vehicle. *The vehicle centric approach typically requires modification of each vehicle's configuration every time a major system change occurs.* Examples of these would include adding or modifying an intersection, modifying mutual-aid coverage or bus routes into new jurisdictions, adding a new fire station, changing bus routes, or accounting for special events that change intersection treatment - all making the vehicle centric system more difficult to scale and more costly to maintain. Logs of prioritization activity and changes are also stored on the vehicle and may or may not be captured in the intersection. Although not apparent at first, this configuration could represent considerable, on-going operating costs and complexity and introduces delays in utilizing newly deployed resources.

In an intersection centric system (the Opticom™ GPS architecture), vehicles contain minimal information (e.g. their unique id etc.) and generally do not require updating to modify system operations. Benefits of an intersection centric system includes:

- ✓ Each intersection is provisioned with a list of allowed vehicles (typically in blocks) as well as the specific attributes of that intersection (e.g. approach maps etc.). This change is not propagated to any vehicles or other intersections.
- ✓ Overall system configuration can be stored at a central location and is not duplicated in the vehicles or across multiple intersections.
- ✓ Control of the intersection operation remains with the maintaining agency, typically Traffic Engineering. Intersection configuration can be accessed and verified in real time, over the customer's communications network, and modifications can be made with immediate effect, without the need for mobilization. This eliminates labor and transportation risks and costs.

- ✓ Authorized vehicles have use of an added intersection as soon as the intersection is added without modifications to vehicle provisioning.
- ✓ Newly added vehicles will be able to use ANY equipped and authorized intersection, irrespective of whether the intersection was equipped and programmed when the vehicle was installed.
- ✓ Vehicles don't have to be reprogrammed when intersections are modified or mutual aid or transit is extended into other jurisdictions. This is a significant benefit for mutual, automatic and/or disaster aid.
- ✓ In mutual aid scenarios, jurisdictions do not need to propagate their intersection data to the vehicles managed by the other jurisdictions. Avoiding this eliminates both the coordination complexity and the associated security risks.
- ✓ Supports real-time monitoring of intersection activity from a central location (CMS). Extremely useful in troubleshooting, diagnosing and fine-tuning the intersection configuration. Moreover, approach maps may be modified from central (click and drag) if needed and the change takes effect immediately without the need to locate and upgrade vehicles.
- ✓ Data is logged at the intersection and is immediately available for download/analysis/troubleshooting/diagnostics/reporting. Data can be accessed locally or remotely via central management software.

Central Management Software (CMS) Evacuation Mode Functionality

With the implementation of GTT's CMS, the system administrator has the ability to manage, maintain, monitor and manipulate the Opticom™ system.

One of the capabilities of the CMS is evacuation mode. When evacuation mode is active, selected vehicles on selected routes normally managed in TSP mode are elevated to an EVP or pre-emption level. This would typically be used to guarantee transit vehicles unobstructed egress such as after a major event or in a disaster scenario. The advantage of this scheme is two-fold:

1. Signal timing is only modified when actual vehicles key to evacuation are present in the intersection resulting is less disruption to normal traffic flows and avoiding unnecessary impact to cross traffic
2. Transit vehicle priority remains below that of emergency vehicles, to ensure the unimpeded flow of emergency vehicles to the originating incident

Multiple evacuation scenarios can be pre-defined with CMS to simplify activation. Similarly, activation can be performed in real-time or preset for specific time intervals.

Evacuation mode thus allows emergency management organizations to take advantage of the city bus fleet in emergency scenarios.

Other Agencies

The Opticom™ system architecture allows other agencies to easily participate in the benefits of traffic signal priority if so desired. Some other possible applications are:

- Emergency Vehicles - Using High Priority, Fire equipment, Ambulances, and EMT rescue vehicles have the ability to utilize the existing and expanding Opticom™ infrastructure. Priority controlled intersections contribute greatly to faster, and safer responses to emergency scenes, contributing to lower accident rates en route, and providing critical time savings, when seconds count.
- Law Enforcement - Using High Priority, law enforcement agencies would have the ability to utilize the existing and expanding Opticom™ infrastructure. GTT has experienced a rapid expansion of law enforcement utilization over the last several years throughout North America.
- Public Works Vehicles - Using Low Priority, GTT has clients that have added the capability to Public Works vehicles to allow for more effective street sweeping and line striping with the ability to continue through the intersection without having to stop.
- Transit or School Buses - Using Low Priority if desired, buses could be equipped with Opticom™ priority control to improve overall fleet efficiency as well as in the event of inclement weather or in evacuation planning as part of an Emergency Response Plan.

Opticom™ Radio

At the heart of the priority control system is GTT's internally designed, 2.4 GHz Frequency hopping, Time Division Multiple Access radio network. The 2.4 GHz frequency band was selected for the radio implementation, rather than 900 MHz band, because mobile transmitters using this frequency band are less likely to experience data drop-outs caused by radio wave multipath reflections. The Opticom™ GPS System uses Global Positioning Satellite technology along with a purpose built radio that was designed specifically for priority control. It uses secure radio communications to gain preemption or priority at equipped intersections. The result is safer, more efficient traffic flow for both emergency service and transit vehicles.

Opticom™ User Benefits:

Benefits for Emergency Services

Faster response for a world where every second counts.

- Improves safety by eliminating right-of-way conflicts at the intersection:
    - First-come, first-serve authorization
    - Vehicle descriptors enable streamlined coding activities
- Facilitates safe, efficient movement through turns:

- Turn signal recognition and relay leads preemption in the intended direction.
- Turn signal recognition clears right-of-way around corners.

- Integrates easily with industry standard communications applications:
  - Provides GPS data output for other on-board devices.
- Provides precise activation and data reporting:
  - Activation is based on estimated arrival (ETA) and/or distance.
  - Superior preemption log accuracy improves liability identification.

Benefits for Traffic Engineers

Easy integration into your current intersection management system.

- Streamlines intersection installation and maintenance:
  - Single intersection radio/GPS unit receives information from all directions.
  - Accommodates hills, curves and varied distances without the need for advanced detectors.
- Minimizes traffic disruption:
  - Turn-signal-dependent mode recognizes the need for protected left turn, reducing potential traffic delays.
  - Adjustable activation based on ETA and/or distance enhances green time efficiency.
- Integrates easily into current cabinets:
  - Phase selector plugs directly into NEMA or CA/NY 170 input files.
  - Compatible with most traffic controllers with internal preemption.
- Software enables implementation and management:
  - Software facilitates configuration, monitoring and diagnosis and produces system reports.

We hope that you will strongly consider these factors as you make your final selection for a GPS-based emergency vehicle preemption system.

Please do not hesitate to contact GTT or Temple with questions.

Sincerely,

Chance Waid
Territory Account Manager
E chance.waid@gtt.com
C 214-548-2497

Special Provision GPS emergency preemption equipment & central management software

Below are compliance statements from Global Traffic Technologies (GTT) regarding the requirements of a priority control system as specified by Jonesboro AR within Bid #2014:22.

1. Description

This item shall include GPS based emergency preemption equipment and Central Management Software with the specifications outlined in this separate line items for intersection equipment and emergency vehicle equipment.

⇨ Comply. GTT is proposing a GPS-based emergency vehicle preemption system, consisting of intersection equipment, vehicle equipment and central management software (CMS).

Software and equipment training shall be considered subsidiary to the equipment cost. The *number of intersections and vehicles are indicated* below: *Traffic Signals: 18* Vehicles: 12

⇨ Comply. GTT's equipment cost includes product costs for instrumenting 18 traffic signals with intersection equipment, 12 vehicles with vehicle equipment, 1 data center with central management software and 2 days of onsite training.

2. Component Specifications

A. The Central Management Software shall include the following features;

- Create and manage device event reports

⇨ Comply. GTT's CMS provides 10 canned and virtually unlimited adhoc reports from the Reports and Opticom Logs modules within CMS. In addition, customized alerts can be created from the Monitoring module.

- Log changes to control settings with a time stamp

⇨ Comply. GTT's CMS provides a history of user changes that have been made.

- Remotely update firmware to field upgradable equipment

⇨ Comply. GTT's CMS provides the capability to remotely update firmware with the Scheduling module. This can be done instantaneously or on a scheduled basis according to user preferences.

- Provide a vehicle ID with each event

⇨ Comply. Within the Opticom Logs module, a record of each preemption event is stored, including Vehicle ID. Included within the log are several pieces of information, including Date, Start Time, End Time, Duration, Intersection Name, Channel, Vehicle ID (Code), Priority, Preempt (Y/N), No Preempt Cause, Turn Signal Status, Entry Speed, Exit Speed, Average Speed, Conditional Priority, Relative Priority, Directional Priority, InRange Duration, Preempt Output, Final Greens and Green Time to name a few.

- Shall have the ability to implement event evacuation plans

⇨ Comply. GTT's CMS contains a dedicated module specifically for Evacuation Plans. Evacuation plans can be configured to control one intersection at a time or by route/corridor and is user-definable.

B. The Intersection Components shall include the following features:

- Remote antenna located on the traffic signal mast arm allowing for 360 degree reception and transmission with applicable cable and mounting hardware

⇨ Comply. GTT's 3100 intersection radio/antenna is designed to be mounted on a mast arm – most commonly, the mast arm closest to the traffic cabinet in order to minimize installation and maintenance costs. The 3100 contains an omni-directional antenna with 360 degree reception and transmission capability. This proposal bundles mounting hardware and GTT 1070 installation cable.

- Ethernet based rack or shelf mounted selector/detector unit that logs the following information:
  Location Name Vehicle ID Channel Enabled
  Green Signal Indications Displayed
  Length of Event
  Average speed of enabling vehicle

⇨ Comply. As stated in Section 2A above, there are several pieces of information that are logged in the 764 phase selector and transmitted to CMS. Location Name, Vehicle ID, Channel Enabled, Green Signal Indications Displayed, Length of Even and Average speed of enabling vehicles are all logged. The 768 Auxiliary Interface Panel (AIP) is required and included in this proposal in order to achieve this capability.

- Card rack (if required)

⇨ Comply. GTT has included optional 760 card racks as part of this proposal.

- Auxiliary Interface Panel (if required)

⇨ Comply. As stated in the phase selector section, the 768 AIP is required and included in this proposal.

- *All applicable connectors and jumpers*

⇨ Comply. In order to properly wire the 768 AIP, shop wiring and terminal block connectors to the cabinet backplane are required and included in this proposal.

C. The Vehicle Equipment shall include the following features: GPS Control Unit
GPS Antenna with applicable cables and connectors
Vehicle Interface Cable
Vehicle Hardware Installation Kit

⇨ Comply. The GTT 2100 (high priority) and 2101 (low priority) vehicle kits include subcomponents including: 1050 vehicles antenna with cables and connectors, 2171 vehicle interface with 25-pin connector and Vehicle Hardware Installation Kit with manual. The 2100/2101 is equipped with multiple module of communications control including: Ethernet, serial and USB.

3. Product Presentation

As part of the selection process, a representative from each bidder shall give a product presentation. The presentation shall cover the following areas:

Central Management Software capabilities
Intersection components programming and options
Vehicle Equipment programming and options
Procedures for adding additional intersections and vehicles to the existing system in future phases

⇨ Comply. GTT is prepared to deliver a product presentation that includes these topics to Jonesboro AR as part of the proposal delivery process. Please allow for at least 2 weeks of advanced notice so travel arrangements of the pertinent GTT personnel can be coordinated.

4. **Basis of Payment**

Equipment, software and training supplied under this job shall be measured by Lump Sum: which price shall be full compensation for furnishing GPS based preemption equipment for 18 intersections, 12 vehicles, central management software, training and all incidentals necessary to complete the work. Intersection and vehicle installation shall be on separate pay lines (see page 1).

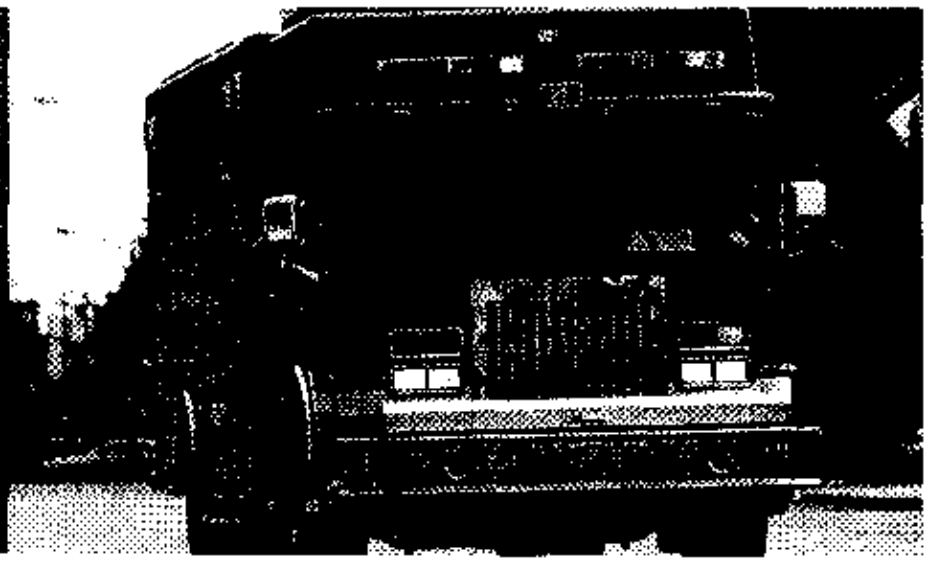
⇨ Comply. Instructions as outlined on Page 1 have been followed.

OPTICOM | Emergency Vehicle Preemption (EVP)

for Fire and Emergency Medical Services (EMS)

Opticom® helps save lives and preserve resources.

Emergency responders are the lifeline of their communities. Delays arriving on scene can put property and lives at risk. Even their own. That's why fire and EMS agencies choose Opticom traffic signal priority control solutions. Our reliable, scalable systems help ensure safer, faster on-scene arrival while maximizing resources and your investment.



OPTICOM BENEFITS

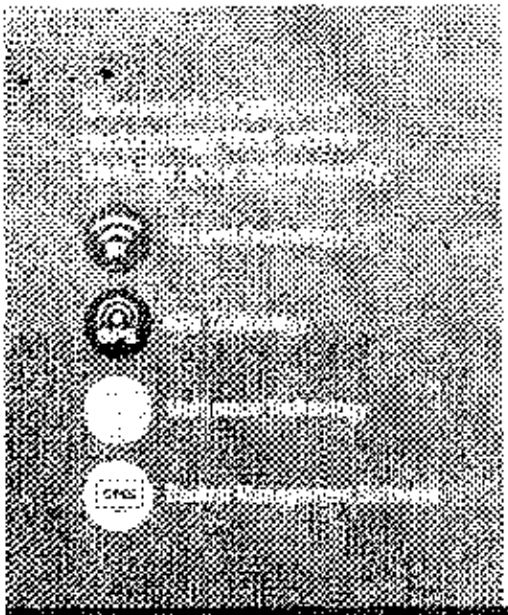
PREVENT INJURIES AND RELATED COSTS

OFFER **QUICK PAYBACK** ON YOUR INVESTMENT

DECREASE LIABILITY FOR CRASHES WITH OTHER MOTORISTS

OPTICOM INJURIES

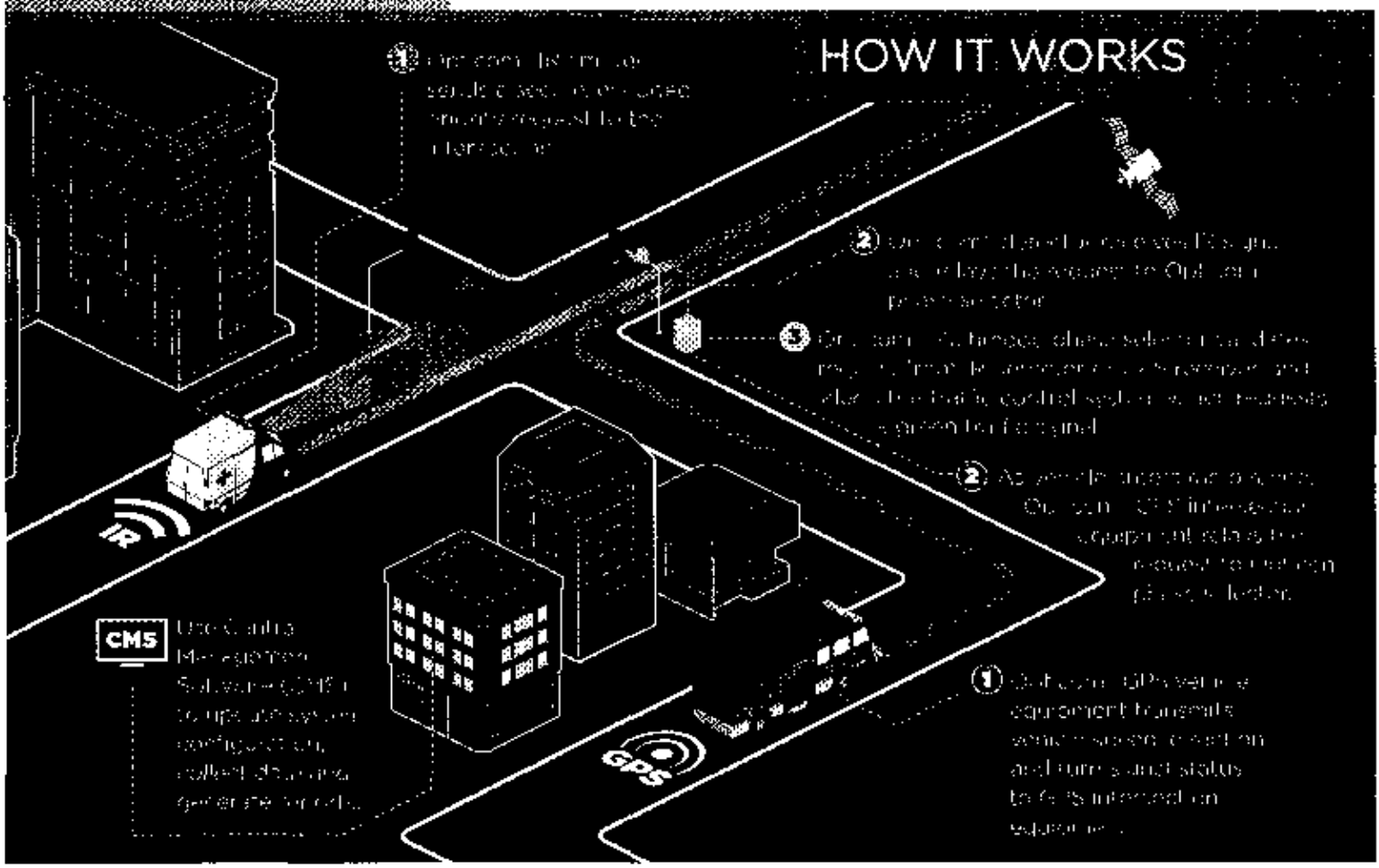
GLOBAL TRAFFIC TECHNOLOGIES



Serve the community, protect your investment

Discover why GTT's installed base has grown to more than 70,000 intersections in nearly 3,000 cities worldwide. Our innovative technologies and expert services improve how you serve your community. Join other public service agencies — including law enforcement, transit and public works — and use Opticom® for more effective mutual aid strategies and to resolve critical traffic management challenges cost-effectively.

Choose either Infrared (IR) or GPS technology — or use a combination of both via our Multimode solution. You can also manage your entire traffic signal priority control system remotely in real-time using Opticom® Central Management Software (CMS).



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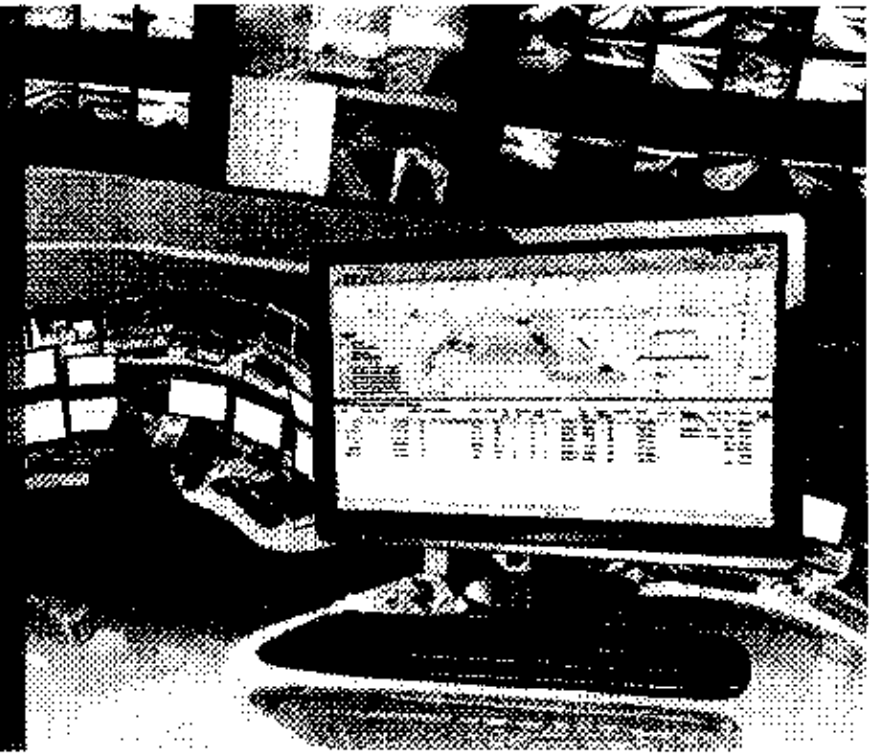
OPTICOM | Central Management Software (CMS)

Manage priority control systems — from your desktop

GLOBAL TRAFFIC TECHNOLOGIES

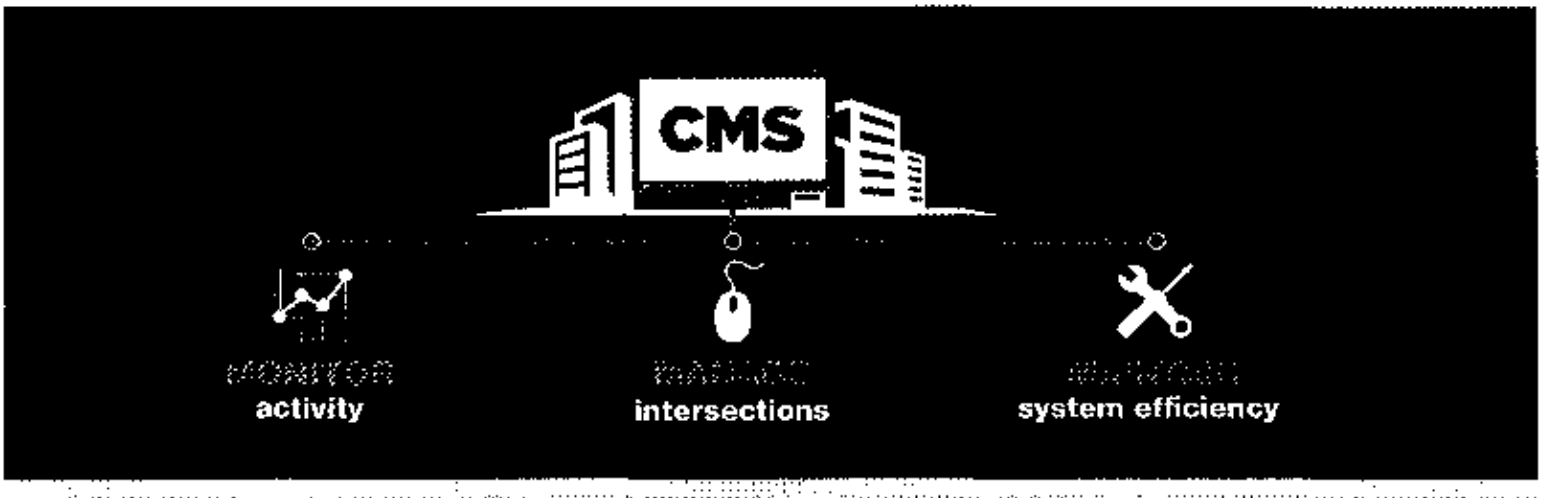
OPTICOM Central Management Software

POWERFUL DATA, SMARTER DECISIONS



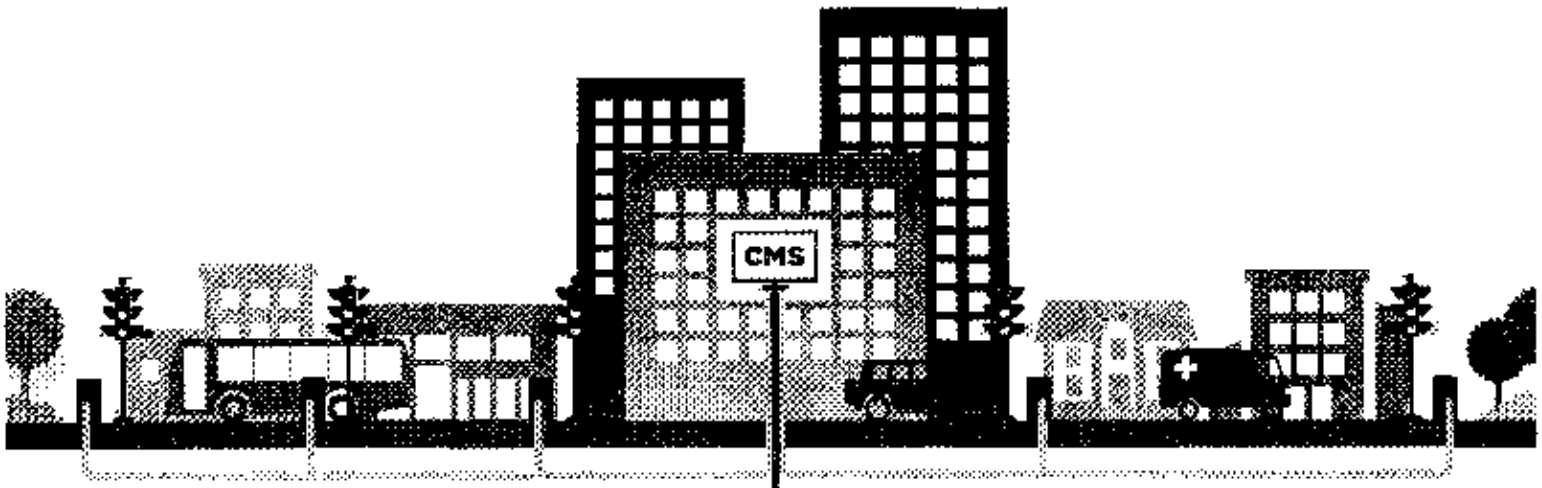
Monitor, manage and maintain your Opticom® priority control systems more efficiently and make more informed traffic *flow decisions — anywhere, anytime.*

Opticom® Central Management Software (CMS) provides real-time data, so traffic engineers can retrieve activity logs, diagnose maintenance issues, upgrade firmware and troubleshoot equipment. It reduces operating costs, improves workflow and results in fewer technician trips to the field.



REMOTE, REAL-TIME PERFORMACE

Streamline maintenance, reduce costs



Access inventory and asset management reports

Receive automated maintenance alerts

Configure phase selectors remotely

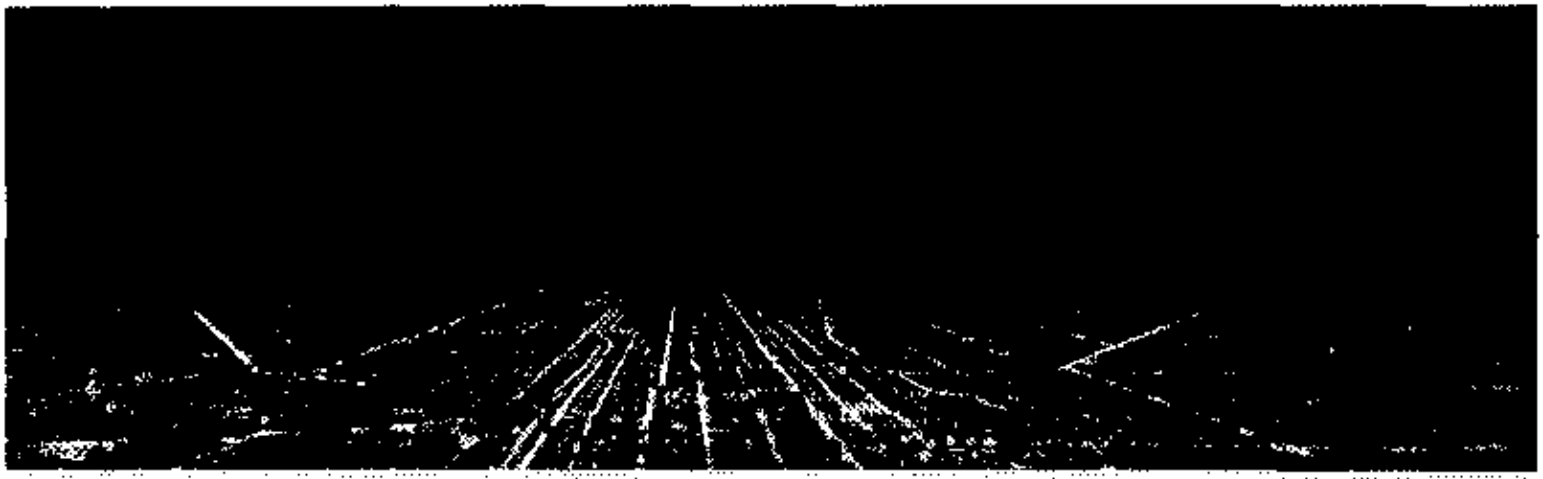
Update firmware remotely

Track intersection activity in real time

Generate maintenance reports

SMARTER, FASTER AND MORE AFFORDABLE *PRIORITY CONTROL*

- Perform critical maintenance tasks remotely and reduce operating costs
- Be the first to know when maintenance is required
- Manage centrally to reduce technician trips to the field
- Diagnose equipment quickly to make more informed maintenance decisions
- Protect system integrity with secure, authorized reporting tools
- Schedule Transit Signal Priority (TSP) activation to improve service levels
- Take advantage of automation tools to leverage available resources



CHANGING THE WAY CITIES MOVE

GTT empowers cities and helps them solve their most critical traffic problems. With innovative technologies like Opticom® Central Management Software (CMS), you can be better informed, better-equipped and more in control.

First responders can reach emergency scenes more quickly and more safely. Transit systems can run more efficiently and more profitably. And traffic engineers can readily access new information that helps them minimize traffic flow disruptions.

GTT solves problems for cities of all sizes, from towns of thousands to megacities of millions. We're ready to help you, too.

For more information:

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OPTICOM™ PRIORITY CONTROL SYSTEM
OPTICOM™ GPS SYSTEM INTERSECTION EQUIPMENT

OPTICOM™ SYSTEM COMPONENTS FOR ENVIRONMENTS WITH GPS TECHNOLOGY

Description

The Opticom™ GPS System assists authorized vehicles through signalized intersections by providing temporary right-of-way through the use of common traffic controller functions.

The Opticom™ GPS system consists of the following matched components:

Intersection Equipment

- Opticom™ Model 3100 GPS Radio Unit containing a GPS receiver with antenna and a 2.4 GHz spread spectrum transceiver with antenna

  –OR–

  Opticom™ Model 3101 GPS Radio Unit containing a GPS receiver and a 2.4 GHz spread spectrum transceiver, with Opticom™ Model 1050 GPS/Radio Antenna and Opticom™ Model 1072 GPS Cable Assembly
- Opticom™ Model 764 Multimode Phase Selector
- Opticom™ Model 768 Auxiliary Interface Panel
- Opticom™ Model 1040 GPS Card Rack or Opticom™ Model 760 Card Rack or Opticom™ Model 770 Card Rack
- Opticom™ Model 1070 GPS Installation Cable

Vehicle Equipment

- Opticom™ Model 2100 High Priority Radio/GPS Control Unit

  –OR–

  Opticom™ Model 2101 Low Priority Radio/GPS Control Unit
- Opticom™ Model 1050 GPS/Radio Antenna
- Opticom™ Model 2171 Vehicle Interface Cable

Opticom™ GPS system intersection equipment consists of the compact, weather resistant RF-energy-emitting Opticom™ Model 3100 GPS Radio Unit containing a GPS receiver with antenna and a 2.4 GHz spread spectrum transceiver with antenna. The radio unit is connected to an Opticom™ Model 764 Multimode Phase Selector via an 11-conductor radio/GPS cable.

The Opticom™ Model 764 Multimode Phase Selector can be installed directly into a CA/NY Type 33X input file or most NEMA traffic controllers equipped with priority phase selection software, or into virtually any other traffic controller equipped with priority phase selection inputs and related software.

When input file space is not available, an Opticom™ Model 760 Card Rack is required. An external 120 VAC power source provides the power that is required to operate the Opticom™ Model 764 Multimode Phase Selector. The phase selector provides power to the radio unit.

The Opticom™ Model 764 Multimode Phase Selector processes the signal from the Opticom™ Model 3100 GPS Radio Unit and activates outputs, which are connected to the preemption inputs on the traffic controller. There are four channel outputs accessible on the rear connector of the Opticom™ Model 764 Multimode Phase Selector and up to 12 additional channel outputs on the Opticom™ Model 768 Auxiliary Interface Panel.

Global Traffic Technologies, LLC (GTT), formed in 2007 from 3M's pioneering Intelligent Transportation Systems business, is the manufacturer of Opticom™ priority control systems and Canoga™ traffic sensing systems.

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OPTICOM™ GPS SYSTEM INTERSECTION EQUIPMENT

OPTICOM™ SYSTEM COMPONENTS FOR ENVIRONMENTS WITH GPS TECHNOLOGY

Each channel output delivers a constant output for high-priority activation, and a pulsed output for low-priority activation. A high-priority signal received on a channel will override any low-priority activation. In certain modes of operation, outputs may be activated that are dependent on the state of the requesting vehicle's turn signal. Another mode provides separate constant outputs for high priority and low priority. The use of an Opticom™ Model 768 Auxiliary Interface Panel is required to access those additional modes and outputs.

Opticom™ GPS System intersection equipment has the following features:

- Four channels of detection
- Radio range of 2,500 feet
- User-settable range setting by ETA and/or distance
- Call bridging
- Precise preemption output pulse
- Optically isolated outputs
- Varied outputs depending on turn signal status of requesting vehicle
- High and low priority as well as probe frequency discrimination
- "First-come, first-served" priority within each priority level
- Low-priority output may be configured for first-come, first-served or all-channel active
- Priority-by-class and priority-by direction setting via the interface software
- 10/100Mb Ethernet and USB 2.0 communication on the front panel
- RS232 communications front port, rear backplane and Auxiliary Interface Panel
- History log of most recent Opticom™ GPS system activities (10,000 entries)
- More than 38 million agency/class/vehicle code combinations
- Customizable ID code validation
- Two character display, LEDs and keypad to enable diagnostics and place test calls to each channel
- Flexible programming options for priority control parameters
- Direct installation into CA/NY Type 33X input files
- Compatible with most traffic controllers
- Tested to NEMA environmental and electrical test specifications
- Meets FCC part 15 Class A specifications

Physical Dimensions

Opticom™ Model 764 Multimode Phase Selector
Length: 7.0 in. (17.8 cm) x 8.2 in. (20.8 cm) including handle
Width: 2.3 in. (5.8 cm)
Height: 4.5 in. (11.4 cm)
Weight: 0.60 lbs. (272 g)

Opticom™ Model 3100 GPS Radio Unit
Length: 9.0 in. (22.9 cm)
Width: 6.5 in. (16.5 cm)
Height: 6.0 in. (15.2 cm)
Weight: 1.8 lbs. (0.816 kg)

Opticom™ Model 3101 GPS Radio Unit
Length: 8.0 in. (20.3 cm)
Width: 4.5 in. (11.4 cm)
Height: 2.7 in. (6.9 cm)
Weight: 1.7 lbs. (0.771 kg)

Opticom™ Model 768 Auxiliary Interface Panel
Length: 7.25 in. (18.4 cm)
Width: 4.5 in. (11.4 cm)
Height: 1.0 in. (2.5 cm)
Weight with cable: 1.4 lbs. (635 g)
Cable: 12 ft (3.6 m)

Opticom™ Model 1040 GPS Card Rack/Opticom™ Model 760 Card Rack/Opticom™ Model 770 Card Rack
Length: 8.25 in. (21.0 cm)
Width: 5.25 in. (13.3 cm)
Height: 5.1 in. (12.9 cm)
Weight: 2.3 lbs. (1.043 kg)

Opticom™ Model 1050 GPS/Radio Antenna
Diameter: 2.85 in. (7.2 cm)
Height: 1.4 in. (3.5 cm)
Cable length: 15.0 ft. (4.6 m)
Weight with cables: 0.6 lbs. (0.30 kg)

Electrical

Opticom™ Model 764 Multimode Phase Selector
Voltage: 89 to 135 VAC, 60 Hz at up to 500mA or 24 VDC at up to 1 Amp

Environmental

Opticom™ Model 764 Multimode Phase Selector
Temperature: -37°C to +74°C (-34.6°F to +165.2°F)
Humidity: 5% to 95% relative

For complete warranty information visit www.gtt.com.

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OPTICOM™ PRIORITY CONTROL SYSTEM
OPTICOM™ GPS SYSTEM VEHICLE EQUIPMENT

OPTICOM™ SYSTEM COMPONENTS FOR ENVIRONMENTS WITH GPS TECHNOLOGY

DESCRIPTION

The Opticom™ GPS System assists authorized priority vehicles through signalized intersections by providing temporary right-of-way through the use of common traffic controller functions.

The Opticom™ GPS System consists of the following matched components:

Vehicle Equipment

- Opticom™ Model 2100 High Priority Radio/GPS Control Unit

  –OR–

  Opticom™ Model 2101
  Low Priority Radio/GPS Control Unit
- Opticom™ Model 1050 GPS/Radio Antenna
- Opticom™ Model 2171 Vehicle Interface Cable

Intersection Equipment

- Opticom™ Model 3100 GPS Radio Unit containing a GPS receiver with antenna and a 2.4 GHz spread spectrum transceiver with antenna

  –OR–

  Opticom™ Model 3101 GPS Radio Unit containing a GPS receiver and a 2.4 GHz spread spectrum transceiver, with Opticom™ Model 1050 GPS/Radio Antenna and Opticom™ Model 1072 GPS Cable Assembly
- Opticom™ Model 764 Multimode Phase Selector
- Opticom™ Model 768 Auxiliary Interface Panel
- Opticom™ Model 1040 GPS Card Rack or Opticom™ Model 760 Card Rack or Opticom™ Model 770 Card Rack
- Opticom™ Model 1070 GPS Installation Cable

Opticom™ GPS System vehicle equipment is mounted on the priority vehicle. Its GPS receiver obtains information from the constellation of global positioning satellites. This information is used to compute the location, speed and heading of the vehicle. This information, along with a priority request and the state of the vehicle's turn signal, is broadcast using the 2.4 GHz spread spectrum transceiver.

Opticom™ GPS System intersection equipment receives the radio transmission from the vehicle equipment. The intersection equipment then compares the information being received from the vehicle with the parameters stored in the intersection equipment's memory. If the vehicle is heading toward the intersection in a predefined approach corridor, is requesting preemption or priority and has met all other programmed parameters, the corresponding phase selector output is activated. This output is connected to the traffic controller.

When activated, the controller cycles to grant a green light to the requesting vehicle or holds the green, allowing the vehicle to pass through the intersection.

The Opticom™ Model 760 Card Rack or Model 770 Gate Opener Card Rack provide the power and logic wiring for the Opticom™ Model 764 Multimode Phase Selector, which plugs directly into a slot in the unit. The Opticom™ Model 768 Auxiliary Interface Panel provides connections for monitoring green phases and provides additional priority control outputs as well as additional outputs for time synchronization and confirmation lights.

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OPTICOM™ GPS SYSTEM VEHICLE EQUIPMENT

OPTICOM™ SYSTEM EQUIPMENTS FOR ENVIRONMENTS WITH GPS TECHNOLOGY

Features

Opticom™ GPS System vehicle equipment is intended for use on priority vehicles. The vehicle equipment kit consists of the compact Opticom™ Model 2100 or 2101 Radio/GPS Control Unit containing a GPS receiver and a 2.4 GHz spread spectrum transceiver, used with the Opticom™ Model 1050 GPS/Radio Antenna and the Opticom™ Model 2171 Vehicle Interface Cable.

Opticom™ GPS System vehicle equipment has the following features:

- Operates on 10-36 VDC
- Vehicle interface inputs 10-36 VDC
- Less than 2 amps peak current draw
- Configurable turn signal sense inputs with multiple activation options
- Speed pulse sense (future)
- Reverse/Neutral sense (future)
- 4 configurable outputs (future)
- 2 configurable inputs (future)
- Status indicators
  - On/Off switch
  - Status
  - Radio
  - Link
  - Priority
  - Disable
- Brightness level of indicators is photosensor controlled with separate settings for day and night
- Capability to control an Opticom™ infrared emitter through a single control module
- Meets FCC part 15 Class A specifications
- Option to add dead reckoning unit (future)
- Additional GPS output in NMEA format for other onboard uses
- Vehicle identification encoding; selectable at installation
- 25-foot interface cable for installation flexibility
- Adapter available for upgrading from previous generation equipment without rewiring
- Available Windows® Configuration and Maintenance Software
- Configurable operating mode of disable input
  - Latching or non-latching
  - Disable trigger method
    - +12 VDC to ground
    - Ground to +12 VDC
- Configurable remote activation mode
  - Apply+ 10-36 VDC
  - Apply + 5VDC
  - Apply ground
- Configurable activation method
  - Light bar and/or manual
- Accepts Passenger Count, and Minutes Late conditional priority input via J1708 from compatible onboard devices such as AVL and passenger counters.
- Internally records each system activation. Each entry contains:
  - Intersection name
  - Date and time of the activity
  - Vehicle class code vehicle ID, Agency ID
  - Channel called
  - Priority of the activity
  - Duration of the activation
  - If preempt has been requested and reason if not
  - Turn signal status at the end of the call
  - Entry, exit and average speed
  - Relative priority level
  - Conditional priority level

Operating Parameters

- Temperature: -34°C to +74°C (-30°F to +165°F)
- Humidity: 5% to 95% relative
- High or low priorities selected by model
- User-programmable vehicle ID code, which is transmitted to intersection equipment
  - 254 agency IDs
  - 15 vehicle classes
  - 9999 vehicle IDs
  - Over 36 million combinations per priority level
- User-programmable reference vehicle name (up to 40 characters)
- Self-diagnosis
- Non-obstructed transmission at least 2,500 feet (762 m)
- Turn signal monitoring transmitted to intersection
- RS485/J1708 serial interfaces
- GPS data output
- Ethernet port
- USB Port
- RS-232 serial port

The following reference model numbers appear on the shipping boxes and serial plate labels:

Opticom™ Model 1050 GPS/Radio Antenna

Opticom™ Model 2100 High Priority Radio/GPS Control Unit

Opticom™ Model 2101 Low Priority Radio/GPS Control Unit

Opticom™ Model 2171 Vehicle Interface Cable

Physical Dimensions

Opticom™ Model 2100 or 2101 Radio/GPS Control Unit

Length: 7.25 in. (18.4 cm)

Width: 5.44 in. (13.8 cm)

Height: 1.63 in. (4.1 cm)

Weight: 1.2 lb. (0.5 kg)

Opticom™ Model 1050 GPS/Radio Antenna

Diameter: 2.85 in. (7.2 cm)

Height 1.4 in. (3.5 cm)

Cable Length: 15.0 ft. (4.6 m)

Weight with Cables: 0.6 lbs. (0.30 kg)

Opticom™ Model 2173 Vehicle Interface Cable Adapter for using previous generation harness

The Opticom™ Model 2173 Vehicle Interface Cable Adapter is available for purchase separately if you are upgrading from a Opticom™ Model 1020 or 1021 Vehicle Control Unit using a Opticom™ Model 1073 Vehicle Interface Harness to a Opticom™ Model 2100 or 2101 Radio/GPS Control Unit. By using the Opticom™ Model 2173 Vehicle Interface Cable Adapter, you will not need to rewire the vehicle. In this case, you will not need the Opticom™ Model 2171 Vehicle Interface Cable that is included with your new vehicle kit.

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