Multi-Modal Intelligent Traffic Signal System — Safer and More Efficient Intersections Through a Connected Vehicle Environment

The ABCs of Fire Alarm Systems — Part XXXI

Adaptive Traffic Control Systems — Part 5: SynchroGreen

Advance Performance: Utah DOT Uses Innovative System to Publicize Performance of Signalized Intersections

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TRAFFIC SIGNAL — TRAFFIC CONTROL

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Eberle Design, Inc. is pleased to announce the introduction of the MMU2-16LEip and MMU2-16LE SmartMonitors®. Both models fully comply with the recently updated NEMA TS2-2003 (R2008) standard for traffic controller assemblies, Amendment #4-2012. This new standards update defines Flashing Yellow Arrow (FYA) operation for both the Controller Unit and the Malfunction Management Unit (MMU).

Like the original SmartMonitors®, the MMU2 series provides built-in Setup and Diagnostic Wizards to quickly and accurately configure the signal monitor programming and automatically pinpoint faulty signals, thus providing technicians with unprecedented amount of assistance and data.

To learn more about the new “MMU2” SmartMonitor® models, please contact us today! *Why guess when you can know!*

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Hi Everyone:

I write this message on the heels of our annual conference in Schaumburg, IL a few short weeks ago. It was a wonderful event at a beautiful venue. I am pleased to have been passed the torch (literally) by our Past President Jeffrey Knight and truly look forward to leading your Board of Directors over the next year.

After we left the Conference, we travelled to Northern Michigan along the south shore of Lake Superior, for the most part camping on our way home to Southern Ontario. It is truly a very beautiful part of the country.

While sitting one evening in front of a very healthy bonfire with a cup of tea in one hand and a fire poker in the other, I realized that IMSA is very much like the fire I was watching.

Toward the bottom were the fading embers of coals that were once the heart of the fire. This reminded me of the passing of our members over the last little while and the contributions they had made toward the building, growth, and maintenance of IMSA.

A little higher was the life of the fire. The coals burned bright and hot, reminding me of the membership as a whole. Like IMSA members, the heat, the glow, the work, and the mission are tremendous. Without these coals — the membership — the fire — IMSA — would be nothing.

Above that, the burning logs tell the tale of IMSA Leadership. The flame represents the work the leadership of IMSA displays. I am happy to report a strong and diversified Leadership Team exists to guide IMSA through these times of many challenges. The flame burns brightly as does the effort and commitment of your IMSA Leadership.

Finally — and most important — are the logs I just placed into the bonfire. For the most effective use, you don’t just throw the wood on top. It has to be placed in such a fashion as to be most effective. Our new volunteers at both the Section and International levels are just the same in my mind. They need to be selected and groomed and placed in positions where they will be most effective. After all, they are the future leadership, the future heart of the fire.

I have to congratulate the team of new and established employees of IMSA, including the Executive Director, for organizing a very fine Conference. For the majority of attendees, it was their first Conference and, while I am sure there were hiccups here and there, it was a job well done.

I am also very proud of your Section Delegates who were busy at the Council of Delegates meeting. Their workgroup created a Strategic Plan for the Board of Directors, which was passed by the Council and delivered to the Board. Additionally, there was an election held for the Directors-at-Large and I must say that among six qualified candidates, the tough decision to elect four occurred. This was not an easy task for the Delegates.

A special thanks goes to Belinda Younger-Gurley upon her completion of three years on your Executive Committee, serving along the road as President-Elect, President, and Past President. Her tenure witnessed and instigated a number of important changes for IMSA and has set us on the current path. Thank-you so much, Belinda.

If you would like to submit an article for publication in the IMSA Journal you may do so by sending it to Journal@IMSAsafety.org. Articles should include a photograph of the author and a brief bio.
Also, thanks goes to Jeffrey Knight, now Past President, after his year at the helm. Jeff has led us through the important milestones that have occurred in the past year, including the hiring of our new Executive Director and the relocation of the International Headquarters. These are no easy tasks, asked of a volunteer.

Hans Kristensen also needs to be congratulated as he moves into the position of President-Elect. Hans has no trouble getting involved in all aspects of Board work and it has been a great privilege to work with him at the Board level.

A new Board Member as Director-at-Large is Todd Lohman. I speak on behalf of the remainder of the Board in wishing him well as he shows his dedication to IMSA and we all look forward to his contributions.

So, at the end of the day, this is how your new Board of Directors appears:

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Until next time,
Work safe, play safe, and drive safe.

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Work safe, play safe, and drive safe.
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Introduction

While the transportation industry has seen technological advancements in computerized systems, traditional traffic signal control has remained largely unchanged over the past five decades. In the case of signal priority for multiple modes of transportation type (emergency vehicles, public transit, trucks, pedestrians, and vehicles, etc.), traffic signal control logic and control strategies (actuated phases and coordination) currently address special or desired priority service on an independent or first-come, first-served basis when requested. Unfortunately, on April 16, 2014 in Monterey Park, CA, a fire engine and ladder truck from neighboring fire departments collided at an intersection while responding to an emergency call. This accident clearly demonstrates there is a distinct need to simultaneously and safely address multiple priority requests at intersections.

The Multi-Modal Intelligent Traffic Signal System (MMITSS) demonstration featured at the 2014 World Congress on ITS Technology Showcase (on Belle Isle in Detroit, MI), presented an intelligent traffic priority signal system that operates in a connected vehicle environment (vehicle-to-vehicle — V2V; and vehicle-to-infrastructure — V2I). Econolite Group, Inc., in cooperation with the University of Arizona, Savari, Inc., and the University of California, Berkeley PATH program, demonstrated a multi-modal intelligent traffic signal system. MMITSS is a project supported by the CTS Pooled Fund project as well as Maricopa County Department of Transportation, Arizona Department of Transportation, and California Department of Transportation. The MMITSS Technology Showcase demonstrated the operation of a multi-modal priority signal control system in which several priority requests from varying modes of transportation (e.g., emergency vehicles, public transit, and pedestrians) are safely accommodated simultaneously. The demonstration illustrated how existing technologies and products can provide intersection advantages by implementing a Connected Vehicle-based solution to identify, prioritize, and provide safe passage for several simultaneous authorized priority vehicle requests at an intersection.

Today’s advanced transportation management systems (ATMS) provide real-time traffic monitoring and control capabilities with the system-wide software foundation to support a connected vehicle environment. With recent advances in wireless communications and protocols, such as the dedicated short-range communications (DSRC) SAE J2735 Message Set Dictionary standard, the critical wireless communication required for an effective V2I system is available. Controlling the intersection requires a powerful traffic signal controller that supports signal phase and timing (SPaT) status information from DSRC-based roadside devices. ATMS and DSRC combined can provide groundbreaking intersection and traffic control capabilities when combined with MMITSS algorithms and features that are more powerful than each of the individual components to provide enhanced safety and mobility within a Connected Vehicle environment. Together, these proven Intelligent Transportation System (ITS) components can fuel an MMITSS that offers the first real opportunity for significant advancements in traffic signal control, particularly for simultaneous multi-modal signal priority.

The Demonstration

The MMITSS system demonstration represents a market-feasible solution for prioritizing intersection signal requests for service within an integrated connected — V2V and V2I — environment. It did so with transportation management solutions currently available:

- **Econolite** — Traffic Cabinet, Controller, Signals, and ATMS software products
- **University of Arizona** — MMITSS Signal Priority Application
- **Savari, Inc.** — Roadside Equipment (RSE), On Board Equipment (OBE) that comprises Vehicle Awareness Device (VAD) and Aftermarket Safety Device (ASD), Android applications such as SPaT Listener and SmartCross pedestrian application.

The MMITSS Technology Showcase demonstration featured a National Electronics Manufacturers Association (NEMA) traffic cabinet outfitted with an Econolite Cobalt™ ATC traffic signal controller, and traffic signal
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and pedestrian heads. Savari provided its OBE and RSE family of products. The Savari OBE products are designed as a flexible open platform based on Linux for deploying the technologies needed to support a connected vehicle environment. The OBE features DSRC and WiFi radios and a GPS receiver. The OBE is powered via the automotive 12V power outlet. The magnetic mount DSRC and GPS antenna is attached to the exterior of the vehicle for better reception. Savari’s RSE was a fixed wireless gateway mounted on a roadside portable tripod. The RSE is built according to the USDOT RSE 3.2 specification, contains an embedded platform with two DSRC radios, and wirelessly communicates with the Savari OBE. It communicates via

Figure 1: System architecture diagram of the priority signal system — V2I (courtesy of University of Arizona).

Figure 2: MMITSS demonstration route in Belle Isle State Park as part of the Technology Showcase at the 2014 World Congress on ITS (Detroit, MI).
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DirecTime’s advanced two-way communication streamlines your traffic control device programming, slashing the time and labor required when using outdated time clocks.

No more manual key pad punching of old one-way time clocks. Intuitive, calendar-based programming confirms schedules.

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DirectTime Controller Features:
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PUBLIC WORKS DIRECTOR QUOTE: “Updating or correcting the timing of the [devices] would take all day. It was time-consuming and labor-intensive.” Now, if something unexpected happens, such as school closures because of snow, technicians simply access the website and type in adjustments that are sent to all the flashing school signs at once. “It only takes a matter of minutes...this is much more efficient use of our small staff.”
the NTCIP protocol over Ethernet to the Econolite controller. Designed as a flexible platform, the Savari RSE hardware facilitated the V2I communications. This hardware and communications connectivity enabled the University of Arizona MMITSS traffic control algorithm application to safely and efficiently manage and implement a multiple requests-based priority signal control strategy.

During the demonstration participants boarded a vehicle that represented the “Transit” vehicle (bus, light rail, etc.), and were driven in a northerly direction toward a four-way signalized intersection. As the “Transit” vehicle approached the intersection, two vehicles, representing “Emergency” vehicles traveling from east and west directions approached the intersection at the same time. The participants witnessed how the connected vehicle systems enabled the signalized intersection to safely prioritize and simultaneously accommodate all of the vehicles approaching the intersection. After safely passing through the intersection, passengers disembarked the “Transit” vehicle and participated in the SmartCross portion of the demonstration. The participants, as pedestrians, walked toward the same intersection, and were able to request a pedestrian crossing signal via a mobile device with SmartCross, the Savari pedestrian walk request Android application.

**Conclusion**

As a result of combining the available transportation management and wireless technologies, MMITSS has the potential to provide detailed information required for intelligent traffic signal control, multi-modal priority, and performance observation. It can provide real-time knowledge of vehicle class (passenger, transit, emergency, commercial), position, speed, and acceleration on each approach. In addition, the ubiquitous use of other wireless devices, including DSRC, WiFi, 3G/4G, and Bluetooth-enabled phones and tablets, it can also provide coverage for other travelers such as pedestrians and bicyclists. The potential for safer and more efficient multi-modal traffic signal operations in a connected vehicle environment is easier to acquire than most people think.

Figures 3 and 4: Intersection signal prioritization is especially critical for first responders, including fire department and other emergency vehicles. It can also play an integral part in keeping public transit and traffic flow moving efficiently.
Control Freak

Introducing RTC Connect™ — RTC’s premier central software platform for programming and maintaining school zone flasher systems with two-way communication. It is designed to meet the ever-expanding requirements of municipalities across North America. Intuitive by design, RTC Connect™ software is easy to configure, allowing for programming of normal-day operations with multiple exception flexibility.

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“Olde Tyme Fyre Alarme Controls”

In response to recent interest in older fire alarm equipment, reporting systems, etc., we are now continuing with older DC operated systems from the 1950s and 60s.

Like their AC operated counterparts, these systems contained hand-wired sub-panels that performed basic functions, because at that time printed circuits were non-existent. Operating power was furnished from one side of the electric service, which in those days was 115VAC, unlike the present supply of 120VAC (which is still commonly referred to as “110VAC” — heaven only knows why) and standby was provided by a bank of wet-cell batteries. Lead acid batteries were mostly used, but occasionally nickel cadmium batteries were also used. In those days, a trouble bell was employed (single supervised system) as an audible signal and almost always had a 4” diameter gong shell. One manufacturer used a gong shell shaped like a cowbell, which really had a distinctive sound. Power failure of AC1 caused an energized relay to drop out, which then applied DC from the batteries to a trouble buzzer that was only used for this purpose.

Interestingly enough, the battery voltage was around 21.5 VDC instead of the 24 VDC commonly used today. It appears that one of the designers attempted to make some dollar savings by omitting one wet cell from the battery pack.

There was a great deal of short-sightedness on behalf of the planners since the average life of the wet cells was somewhere around 5–10 years, which sounds great. Of course, these old systems were discontinued before the end of this period and later systems, using the newest “printed circuit boards,” depended on gel-cell type 24 VDC batteries.

Repair technicians of later years were unaware the battery chargers were adjusted for charging 21.5 VDC instead of the 24 VDC commonly used today. It appears that one of the designers attempted to make some dollar savings by omitting one wet cell from the battery pack.

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Smoke detectors were fairly unsophisticated and had somewhat limited use until the 1970s. In later years, detectors that operated on line voltage came on the market, simplifying things, but were inoperative during power failures. A while later, one of the first 24VDC smoke detectors came on the market, offering a set of “dry” alarm contacts that connected to the box circuit panels in the same manner as heat detectors and pull stations.
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Once the alarm was detected and processed by the “box circuit” panels, the output was channeled through a main control panel that operated as a sort of central processing unit containing all sorts of operating switches, such as “Alarm Off,” Trouble Silence, etc. and then to the “Indicating Circuit” panel. This panel contained two “bell” circuits that contained unsupervised bells and horns connected in parallel. The only “fail-safe” in those days was to recommend the audibles be “staggered,” with devices connected to different circuits so that, in the event of a circuit disconnect, a device connected to the alternate circuit could be heard in the area.

One of the most significant developments of the 1970s was the invention of the silicon diode. This enabled the rectification of large amounts of AC by a very compact component. One of the greatest uses of the diode was all bells and horns could be polarized by having a blocking diode installed internally. This enabled polarity-reversing circuitry where the audible was supervised up to the blocking diode. In a non-alarm condition the supervisory voltage did not activate the audible device because the diode blocked it. In alarm condition, alarm voltage reversed polarity, so the full voltage sounded the device.

Municipal master boxes were quite common and a master box panel was used to trip the box. Like its AC counterpart, the DC version also monitored the wiring of the box trip unit and had a cutoff switch to disconnect the box.

Indicating lamps were located on the door of the cabinet and key switches were often used to eliminate the need of opening the door to silence the alarms, trouble signals, etc.

Lamps were used to indicate the presence of operating AC, alarms, trouble signals, etc.

Annunciation was by means of dry contacts with annunciator lamps installed on the door.

The DC systems also used carbon filament annunciator lamps on the door that offered what was known as “negative” annunciation. These lamps were common in the telephone industry and were of the “slide base” type. To replace, you pulled out the faulty lamp and slid in a new one. These lamps were connected in series with the initiating circuits and glowed at half strength to indicate that each circuit was operating normally. In the event of a break, the light extinguished, showing the circuit that was in trouble. During alarm, the lamp glowed stronger.

Another service problem that showed itself in later years, when the panels had been discontinued, was the technician was often unaware the lamp was of the carbon filament type and often replaced them with tungsten filament slide-based lamps. Carbon filament lamps are of the “constant current,” type. That is, when replacing one, there is no momentary inrush current that tungsten filaments have. Sometimes insertion of a tungsten filament lamp increased the supervisory current to the extent that the alarm relay energized, resulting in a trip of the master box and a great deal of embarrassment on the part of the technician when trying to explain to firefighters just why the panel tripped the master box!

Other specialty panels were used to contain auxiliary relays used for various purposes. One of the more clever designs used relays that were listed for use with either 24VDC or 110VAC, which made life much simpler for the system designer.

Believe it or not, to this day many of these panels, even though obsolete, are still reliably operative. The main problem nowadays appears to be the energized relays after being energized for 40 years or more, just as in the case of the AC panels, may sometimes become magnetized so they may stay in the energized position when the operating voltage is removed!
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This is the final article in this series. To review: the original intent of these articles was to provide an overview of the new approach to adaptive controls being introduced into the marketplace.

In this article, we discuss Trafficware’s SynchroGreen. Anyone in the traffic industry will be familiar with the durable Synchro traffic analysis package. Like TRANSYT, which became the foundation for SCOOT, it appears the Synchro may be headed in a similar direction with SynchroGreen. You be the judge!

Nevertheless, here is background on SynchroGreen as “told” by Trafficware.

[Note: Neither IMSA nor myself assume any responsibility for the accuracy of this material.]

**Background**

SynchroGreen is a real-time adaptive signal control technology (ASCT) from Trafficware, the makers of the industry standard for traffic optimization and simulation software, Synchro® and SimTraffic®. SynchroGreen collects traffic data at signalized intersections, analyzes the data for changing trends, and adjusts traffic signal timings in real-time based on current demand. SynchroGreen has three optimization engines designed to optimize the split, cycle, and offset. SynchroGreen considers all vehicle movements and pedestrians within the algorithm, and is designed to optimize the entire traffic network.

SynchroGreen is a software-based ASCT that does not require proprietary hardware. Trafficware has installed SynchroGreen on various traffic controller makes and models and does not require the agency to install any proprietary detection technology. Other significant SynchroGreen system features include:

- Interface and system parameters are based on conventions and standards in the United States. SynchroGreen appears familiar and intuitive to new users.
- Leverages NTCIP and NEMA standards to provide safe and efficient traffic signal operations.
- Algorithm accounts for pedestrians without needing to purchase additional modules.
- Modes of operation provide an “easy button” for favoring different phase movements within a system.
- System settings are calibrated in a simulation before system deployment, resulting in a fast and efficient deployment process.
- After the initial system configuration, no human intervention is needed for the system to efficiently time traffic signals.
- Generates real-time and historical MOEs and other performance management initiatives.

**System Architecture**

There are three major components to any SynchroGreen system: (1) the management system (server), (2) local controllers, and (3) vehicle detection. Within the SynchroGreen interface, the server and local controller are commonly referred to as Signal System Master (SSM) and Signal System Local (SSL), respectively. A typical SynchroGreen setup will have one SSM and several SSLs. There is no limit to the number of SSLs assigned to an SSM. The SSL is responsible for gathering and buffering detection data, as well as executing commands from the SSM. The SSM is responsible for processing all data and calculating updated timing plans. The interaction between SSL and SSM is repeated every few seconds to ensure signal timings are always up to date. SynchroGreen Central Server Software on the SSM installs as a Windows-based executable file on the agency’s computer (server), while the SynchroGreen Local Intersection Software replaces the controller’s prior software on each of the SSLs (see Figure 1).

**Optimization Process**

The primary objective of the SynchroGreen algorithm is to minimize total network delay, while provid-
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PRODUCT INNOVATION

Directly or remotely connect to the UltraPower-Stealth Battery Backup System (UPStealth ™) from a desktop application with Real-Time Intelligence Connect (RTI Connect). Link your computer running Windows or OS X to view, monitor and manage UPStealth performance parameters, such as System Status, Cabinet Load, Backup Run-times and AC Voltage via the Ethernet port on the UPStealth Inverter/Controller or remotely through a network connection.
SynchroGreen has three optimization engines designed to optimize the split (phase allocation), cycle (period), and offset (start time) in real-time based on current traffic conditions.

**Phase Allocation (Split)**

The Phase Allocation is calculated for each phase every period that SynchroGreen is operational. Phase allocation is the adaptive counterpart of the phase split, typically used under standard coordinated type of operation. The Phase Allocation calculation is based on the Green Utilization, or the duration of time that the phase is processing vehicles while at saturation flow. The Green Utilization is estimated using the stop bar detectors.

In addition to the Green Utilization, a Detector Calibration Factor is also used in the Phase Allocation calculation. The Detector Calibration Factor is used to calibrate detectors based on various sizes, positions, and prevailing vehicle speed over the detectors. The Detector Calibration Factor is the percentage of time that a phase should be utilized at saturation flow. The Detector Calibration Factor is user-defined. A smaller factor causes a larger Phase Allocation, while a larger factor causes a smaller Phase Allocation.

The Target Phase Allocation calculation is performed every period for every phase. Once the most recent Green Utilization is known, SynchroGreen divides the Green Utilization by the Detector Calibration Factor. Essentially, the Phase Allocation is derived by determining the amount of time a phase is running at saturation flow based on the Green Utilization, and then proportions that time by the Detector Calibration Factor. SynchroGreen will always use the Detector Calibration Factor as a target for the proportion of time a phase should be utilized at saturation flow. The Target Phase Allocation is not the final Phase Allocation that is sent to the controller. Before the final Phase Allocation is assigned, SynchroGreen must analyze the system globally, and must analyze every phase at every intersection.

**Period (Cycle)**

Once the Target Phase Allocation has been calculated for every phase at every intersection, SynchroGreen analyzes the system globally. First SynchroGreen sums the Target Phase Allocations and constructs standard ring and barrier diagrams; this establishes the Target Period at each intersection. SynchroGreen then looks at the system globally and selects the intersection with the highest Target Period as the critical intersection. The Target Period duration at the critical intersection is assigned to every intersection and the actual phase allocation is assigned to each phase based on the proportion of the Target Phase Allocations (Figure 2).

**Start Time (Offset)**

Start Time is the adaptive counterpart of the offset under standard coordinated traffic signal opera-
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The Start Times recalculate due to changes in the period (cycle) duration as well as traffic flow changes. The Start Time has two components, the lag time and the travel path. The lag time is essentially the relative offset from one intersection to the next. While the initial lag time is user-defined, it also dynamically optimizes based on traffic flow characteristics. The advanced detectors allow lag time modification based on the presence of queuing and the measured platoon arrival distribution. If there is a standing queue at the beginning of green for a given phase, the advanced detectors may be occupied. In this situation, SynchroGreen can incrementally modify the lag time such that the phase releases queues sooner and are less likely to impede an oncoming platoon. SynchroGreen also establishes historical arrival distributions over time. If vehicles tend to arrive sooner or later than historical trends, the lag time can be incrementally modified to accommodate the platoons.

The last component of the start time is the travel path. The user must construct potential travel paths, which are essentially intersection relationships that describe how platoons move through the system. Travel paths ensure that when a platoon arrives at an intersection, the local intersection (SSL) has the most recent timing plans so that coordination and progression are maintained. The illustration above (Figure 3) shows two typical travel path combinations utilized by current SynchroGreen customers.

**Modes**

SynchroGreen allows the user to customize the algorithm based on the goals and objectives of their project. By default, the SynchroGreen algorithm equitably distributes green time based on demand, while providing reasonable mainline bandwidth. However, the user can select different modes to promote mainline bandwidth or critical movements. SynchroGreen modes are as follows:

- **Balanced Mode** — Equitable distribution of green time with reasonable mainline bandwidth.
- **Progression Mode** — Mainline green time is favored over the side streets.
- **Critical Movement Mode** — Critical movements are identified at each intersection. These movements and the associated phase(s) are favored.

**Data Collection**

SynchroGreen is compatible with non-proprietary vehicle detection technology (i.e., inductive loops, video, wireless sensors, radar, etc.). Vehicle detection provides the input data upon which decisions are made within the SynchroGreen algorithm; detection data is continuously recorded by the local intersection traffic controllers and communicated to the SynchroGreen Server. Vehicle detector placement and configuration are critical. SynchroGreen requires stop bar detection and advanced detection. Stop bar detectors must be placed on every lane, on every intersection approach; advanced detectors should only be placed on mainline through lanes, between 250 ft. and 500 ft. upstream of the stop bar. Where intersection spacing is less than 1,000 ft., advanced detectors are not required. All detectors must be placed on independent channels. The user can adjust a calibration factor in order to account for varying detector size, position, and sensitivity (Figure 4).

**Reporting**

SynchroGreen has over 60 built-in reports that allow users to generate presentation-quality documents related to system I/O, alarms, events, parameters, and performance. SynchroGreen has numerous reports that provide measure of effectiveness (MOEs) by intersection and approach, such as v/c ratio or level of service (LOS) (Figures 5 and 6).

**Fallback Operation**

By default, during a communications malfunction that impacts the entire system, SynchroGreen will operate using historical data up until the specified fallback time, which is set by the user. After the fallback timer expires, SynchroGreen will revert to standard time-of-day coordination. When only a few intersections within the system are impacted during a communications failure, the user has several options. The user may pre-program SynchroGreen to simply allow these
intersections to use historical data, or the user may program the system to eliminate impacted intersections from the optimization group or instruct the entire system to revert to time-of-day coordination.

When detectors fail, SynchroGreen will automatically eliminate erroneous detectors from system calculations and will rely on alternate detectors assigned to the same phase/approach. Alternatively, the user may pre-program SynchroGreen to perform a specified action when detectors fail. For instance, the user may configure SynchroGreen to eliminate intersections where erroneous detectors occur from the optimization group or instruct the entire system to revert to time-of-day coordination when a specified number of detectors fail.

System Configuration

System design and deployment is performed by Trafficware or an authorized SynchroGreen distributor, and can typically be completed in 90 days or less. The actual system software installation and turn-on can typically be completed in one day and causes minimal, if any, disruption to the public. After system turn-on, Trafficware or an authorized representative will make adjustments on site or remotely for a period of two to three weeks.

SynchroGreen monitoring and configuration is performed by the system operator using the SynchroGreen Client Application. The SynchroGreen Client Application can be installed on PCs, laptops or tablets and allows the user to easily access all system functionality, settings, and databases. Trafficware will provide the agency with an unlimited number of Client Applications. The Client Application can be configured for different clients based on their designated clearances and permissions to control and monitor the adaptive signal network. Furthermore, client profiles can be customized based on the user’s preferences and can display different views, status screens, and reports. The SynchroGreen Client Application...
Application is important in a mission-critical environment, as it allows the agency to quickly monitor and control the system and ensure it is performing at optimal levels (Figure 7).

**Handling Pedestrians, Transit, Emergency Vehicles**

SynchroGreen handles pedestrian movements similar to time-of-day coordination and considers pedestrians within the default algorithm, without requiring additional modules. SynchroGreen will account for pedestrians and maintain synchronization, and will even account for pedestrian recalls and advanced functionality, such as “green delay” or “pedestrian delay” functions.

SynchroGreen handles transit signal priority (TSP) and preemption (rail, emergency, bus) the same way as it is handled during time-of-day coordination. When a TSP service request is received, local traffic controllers can modify SynchroGreen adaptive signal timings and can provide early or extended green. SynchroGreen will maintain synchronization and adaptive coordination during TSP operations. During preemption, SynchroGreen allows the subject intersection to service preempted phases and operate any track, dwell, and exit phases. During preemption, non-preempted intersections will remain under adaptive operations. After preemption, the subject intersection will resynchronize with SynchroGreen intersections within the group.

**Cost Estimates**

Typical SynchroGreen costs are usually between $10K–$17K per intersection. The cost to deploy a SynchroGreen project varies based upon the agency’s existing detection and traffic control infrastructure.

Contact Person for additional Information

Joe Mineiro: joemineiro@trafficware.com. More information about SynchroGreen is also available at www.trafficware.com

**Summary**

If you have been following these articles, you have seen that a number of vendors are supplying various types of new adaptive traffic systems. One of the difficulties for the users is determining which works best in his situation.

The traditional ATCS, SCOOT, SCATS, RHODES, and others, have been studied in great length over the years — lots of material on operations, maintenance, and performance is available. I would call upon FHWA and the academic community to conduct similar analysis of these new systems and publish the results. Such information would provide the end-user with independent data to assist in the decision-making process regarding an ATCS and its suitability for their agency.

Something to think about!
Advance Performance: The Utah DOT Uses Innovative System to Publicize Performance of Signalized Intersections

By Josh Huntsman, Wavetronix, Provo, UT

The Utah Department of Transportation is on a mission to build a world-class traffic operation. In order to accomplish this, it is important for UDOT’s engineers to know the assets they have in place and to be aware of any problems that may exist within its network. To that end, UDOT has implemented an innovative program that gives them constant, real-time information about the status of its intersections.

The program is called Traffic Signal Automated Performance Measures. UDOT partnered with Dr. Darcy Bullock, professor of Civil Engineering at Purdue University and director of the Joint Transportation Research Program who, along with the Indiana Department of Transportation, paved the way for the program.

Mark Taylor, traffic signal operations engineer for UDOT, said efficient signal plans can be costly and may become less effective as time passes.

“Typical modeling and collection methods only provide a limited snapshot view that degrades over time as traffic patterns change,” Taylor says. “We need to know in real time where the problems are so we can make corrections to operations and improve traffic flow.”

Eliminating these problems is what attracted Taylor to the program, which automatically creates performance metrics based on real-time data. This data is acquired through an existing infrastructure that includes previously installed SmartSensor Advance units from Wavetronix. It is UDOT policy to install advanced detection for any intersection with speed limits of 40 mph or higher; UDOT uses SmartSensor Advance for queue clearance, approach volume counts and speeds, as well as dynamic dilemma zone detection.

“We purchased and installed our Advance sensors really for the purpose of dilemma zone detection, but got benefit from the other three purposes without any additional costs

Utah DOT — cont. on page 30

Earn IMSA Certification: Fiber Optic Training for Traffic Systems

The Light Brigade’s Fiber Optics for ITS, Traffic Systems, Fire Alarm, and Communication Systems training program offers three levels of instruction. These courses provide a practical understanding of how fiber optic technology is integrated into modern traffic systems, and cover essential learning objectives for the IMSA certification testing. Courses updated for 2013.

Technician Level I: Two days of classroom training on the basic theory of fiber optics. A prerequisite for either Level II course.

Field Technician Level II: Two days of in depth hands-on training to master the skills needed to work with fiber optic systems in the field.

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by utilizing the same equipment we already had deployed,” Taylor says.

UDOT oversees around 16,000 lane miles of roadway and 1,150 of Utah’s 1,900 traffic signals. Eighty-seven percent of UDOT signals and 76 percent of non-UDOT signals share a single communications network — including more than 750 intersections that are monitored by Wavetronix sensors.

The automated performance measures utilize Utah’s extensive connectivity in creative and innovative ways, allowing for real-time monitoring of intersections 24 hours a day, seven days a week. The information gathered from this monitoring provides a wealth of data that populate metrics for traffic engineers and others.

Working with UDOT, Wavetronix optimized the SmartSensor Advance to allow the transfer of raw data directly from traffic signal controllers to an eight-terabyte UDOT server using an FTP connection. This bypasses the need for a central traffic management system, meaning the information and metrics can be accessed at udottraffic.utah.gov/signalperformancemetrics on any device capable of navigating the Internet.

“That is revolutionary,” Taylor says. “You always had to have the software on your computer. We are completely outside of that and pulling the high-resolution data straight from the traffic signal controller.”

UDOT chose to make the informational metrics available to anyone who wants it without the need for special permission or software. Since its introduction in January 2013, consultants, municipal transportation departments, academics, and members of the general public have accessed the information gathered by UDOT, the benefits of which have been, according to Taylor, incalculable.

In the first twelve months of usage in Utah, UDOT proactively found and fixed approximately 185 detector problems and optimized traffic signals from one side of the state to the other, including instances where faulty video detection was replaced by Wavetronix sensors. Problems like these would often go unnoticed for long periods of time because no one was regularly monitoring intersections outside normal business hours.

“Before, I would send a technician to check on the detection. He would get there around noon, not see any problem with the signal, leave without doing anything, and write me a nasty note about wasting his time,” Taylor says. “Now, I can tell him that it is the video detection not working in the dark.”

For this innovation, UDOT was honored by the American Association of State Highway and Transportation Officials with a 2013 Group Focus Award, an honor that will bring additional expertise and recognition to the program. Agencies interested in pursuing these metrics outside of a central system can contact a member of the AASHTO TIG Lead-States Committee. The website www.tig.transportation.org has a full listing of signal performance measures committee members and additional information about the AASHTO TIG program.

“Being recognized by AASHTO is a fantastic achievement for UDOT,” says Taylor. “UDOT’s executive leadership has a focus on innovation, recognizing that we cannot always build our way out of congestion. Innovation, creativity, and risk taking must be part of the process to meet the demands placed by a society that continues to grow in size and needs.”

2014 CONFERENCE AND SCHOOL

Section Presidents met to discuss issues and ideas for the future. Front row, left to right: Mike Flanigan, IMSA President and Ontario Section President; Jeff Knight, IMSA Past President and New England Section President; Jeff Brannan, Arizona Section President. Second row: George Baureko, Vice Chair of the IMSA Council of Delegates and New Jersey Section President; Jose Gonzales, Far Western Section President. Third row: Todd Lohman, Director-at-Large, Central Section; Adrian Olguin, Southwest Section President; Hans Kristensen, IMSA President Elect. Fourth row: Jim DeWitt, Midwest Section President; Mike Volling, IMSA Executive Director. Fifth row: Doug Aiken, IMSA Deputy Executive Director; Paul Ciupa, Tri-State Section President.
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The Future of Adaptive Road Lighting
By Jim Frazer

In this article we will identify adaptive roadway lighting architectures, describe data used to drive adaptive roadway lighting applications, and examine the Systems Engineering Process (SEP) as defined by the US Dept. of Transportation. Additional learning objectives include developing project-specific user needs, functional requirements, and a traceable test plan needed by the SEP. Lastly, we’ll examine innovative public/private partnerships, particularly in the area of energy savings.

Questions answered by this white paper include:

- What is the data that will drive adaptive roadway lighting?
- When will these applications actually come to be installed?
- Do we really know all these technologies and systems will work together smoothly and seamlessly?
- Who will pay for it?

What Data Will Drive Adaptive Lighting?

The data that drives adaptive roadway lighting originates in both fixed and mobile infrastructure.

Fixed infrastructure includes traffic signals, environmental sensors, and other data from the utilities and the Smart Grid (Figure 1).

Traffic signals, particularly the advanced traffic controller (ATC) soon will be able to provide traffic signal information to the lighting system, including for pedestrian lighting applications (Figure 2). The ATC is a Linux-based traffic signal control computer that can run multiple applications including intersection control, ramp metering, dynamic message signs, roadway lighting, and connected vehicle systems. Each of these internal applications runs independently; however, data is able to be shared between applications so if a pedestrian presses the crosswalk button, the crosswalk signal can be actuated and the crosswalk lighting can be enhanced. Similarly, if road friction as reported by connected vehicles has decreased due to rain or snow, the dynamic speed limit signs can display a lower safer speed limit.

Environmental sensors include ambient light level sensors, weather stations, and many other devices. Utility inputs to the lighting system, “Smart Grid” data can include current electricity rates.

Mobile infrastructure includes vehicles, pedestrians, and bicyclists (Figure 3). The greatest impact to the lighting systems controls will be integration of “connected vehicle” and “connected pedestrian/bicycle” technology. The National Highway Transportation Safety Board, in conjunction with the US Department of Transportation, is developing standards and deployment application scenarios that can reduce traffic accidents by up to 80 percent. These technologies broadcast 100 different message types such as speed, direction, and location both to adjacent vehicles within 1,000 feet as well as to mobile phones and fixed infrastructure, such as the lighting system and the

Adaptive — cont. on page 36
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traffic signal equipment. The message types used by the lighting system can include road friction, ambient light level, headlight status, windshield wiper status, and more. US DOT mandates are expected in this area.

Other Smart Grid inputs to the lighting systems can originate from data sources other than the utility itself (see Figure 5). These can include signals from the network operations center, the electrical distribution network itself or service providers. This data flow is bidirectional where the lighting and the entire transportation network can provide a forward-looking time and price-based forecast of how much power will be needed — and at what price.

The US DOT NTCIP framework as shown in Figure 6 describes three major areas of communications domains, protocols, and standards. These are connected vehicle (V2I), center-to-field communications (NTCIP12XX), and center-to-center communications for adjacent traffic management centers (TMC).

This significant upgrade required for true adaptive roadway lighting systems and the larger traffic management network is composed of many technologies, protocols, and standards. Unambiguous well-formed standards are required so that communications between varied sub-systems occurs reliably and in almost real-time. National and international standards are used rather than standards from smaller trade and user groups.

In order to confirm that all systems work with each other, the US DOT requires the use of the Systems Engineering Process (SEP). The SEP process includes the development of user needs and the development of measurable functional requirements that are dependent upon those user needs. This allows creation of an un-
ambiguous test plan so the user needs can be confirmed as satisfied by the delivered project.

When evaluating standards, it is important to remember the term “standards” is very broad. The standards used in this evolving effort are the product of nationally and internationally recognized Standards Development Organizations such as IEEE, ITE, AASHTO, NEMA and NTCIP — The National Transportation Communications ITS Protocol. The US DOT standard NTCIP 1213 governs “Electrical and Lighting Management Systems.” It is commonly known as “ELMS.” Figure 7 describes the range of standards, their stakeholders, and the geographical breadth of their applications.

The SEP Vee model is represented in Figure 8. Use of the Vee SEP model starts at the upper left side of the Vee. First a “Concept of Operations” is developed, then the system design can proceed. During this process, first-user needs are solicited from the various groups of stakeholders. They are then refined into requirements. The system design is complete once the project developer reaches the bottom of the Vee. By proceeding up the right side of the Vee, the project developer enters the integration phase of the project, where verification and validation of sub-systems, and eventually the full system, occurs. Lastly, a test plan is developed and performed so the project recipient can confirm that all user needs are satisfied.

This technology upgrade occurs at a cost — as do all things. Adaptive roadway lighting systems do benefit from a significant savings of energy over previous generations of lighting technology. Light Emitting Diode (LED) technology can save up to 70% of current energy usage as compared to high pressure sodium lighting. The addition of controls can save even more.

This energy saving can be rededicated in the agency budget to outright purchase of new lighting systems. In a number of proactive agencies, this savings has been used to fund innovative public/private partnership models that allow lighting projects to be installed years ahead of other methods. The chief scenario in this case is that of a municipal or agency lease, very similar to how agencies currently lease fire and EMS trucks and equipment. Typically a lease can run four to eight years.”

Adaptive — cont. on page 38
at a total monthly cost (energy + lease payment) lower than the cost of current energy use by the current legacy system. At the end of the term the title for the lighting equipment then reverts to the agency. With new lighting systems having warranties of ten years and functional lives of much longer, this makes for a compelling business case.

In summary, many technological enhancements are coming to our streets and highways. These include integration of the fixed roadway infrastructure (lighting, signals) with mobile infrastructure (vehicles and people). This convergence will drive many applications that save lives, energy, and other resources. Assisting in this effort are creative new finance models including agency leasing programs.
CALENDAR OF EVENTS

Rocky Mountain Board & Committee Meetings
1st Tues. of every month

Ontario
October 14, 2014
Ontario Traffic Expo
Contact Ron Whitelock
ron.whitelock@bell.net

Rocky Mountain Section Fall School
October 27–31, 2014
Lamar Street Center
5889 Lamar Street
Arvada, CO 80003
Registration Deadline:
October 8, 2014
Register online at:
www.RockyMountain IMSA.org

British Columbia Section Fall Trade Show and Technical Sessions
November 4, 2014
Executive Plaza Hotel & Conference Centre
Coquitlam
405 North Road
Coquitlam, BC Canada V3K 3V9
For more information, contact us through our fax line: 1-866-266-0369

Southwestern Section Fall Certification Program
November 10–13, 2014
American Airlines Training & Conference Center
4501 Highway 360, South MD
Fort Worth, Texas 76155
For more information:
P.O. Box 4507
Cedar Hill, TX 75106-4507
972-768-1232
imsasw@tx.rr.com

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Local Section Certification contacts see page 8.

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Photos and Signs of the Month

Above: These photos were printed in the last issue of the IMSA Journal and given the wrong credit. They were actually sent in by Dave Barrier of the Arizona Section. Our apologies to Dave.

Left: We are now installing LEFT TURN PUSH BUTTONS for motorists in Raleigh, NC! If this craze catches on, we can eliminate loops.

Mark Slentz
Traffic Signal Supervisor
City of Raleigh, NC

When this intersection was corrected it turned out to be an interesting project: the intersection is in three different cities! It was corrected in a timely manner — although it took the cooperation of four agencies to get the job done.

Brian Schwary
Northwest Section

Right: Hmm, this could be problematic!

Matt Kay
Rocky Mountain Section

Left: We are now installing LEFT TURN PUSH BUTTONS for motorists in Raleigh, NC! If this craze catches on, we can eliminate loops.

Mark Slentz
Traffic Signal Supervisor
City of Raleigh, NC
Tony Haag Recognized For Outstanding Service

On June 15, 2014 at The John Ascuaga’s Nugget Hotel in Reno, NV, the Far Western Section recognized Tony Haag for over 38 years of outstanding service as an IMSA Member, Traffic Signal instructor, and many years as our President and Certification Chair. We also recognized Lew Roberts for over 32 years as an IMSA Member and longtime Traffic Signal instructor. He was also the Far Western Section Secretary/Treasurer for 13 years. The third person recognized was Todd Kruger, who was our Signs and Marking Instructor for 10 years. He and his family will be relocating to San Antonio, TX. Our Far Western Section President Jose Gonzalez presented the awards to our recipients.

Terry Gentry
Public Works Dept.
City of San Dimas, CA
urHub Announces “Next Generation 5-1-1” Suite of Products to Improve User Experience

urHub, a division of The Hub Companies, LLC, and the organization responsible for development of the Public Private Partnership with the Colorado Department of Transportation for the CDOT Mobile Smartphone application, introduced an expanded suite of products designed to enhance the usability of digital information interfaces.

The SmarTranz product suite for Transportation Agencies forms the basis of urHub’s “Next Generation 5-1-1” traveler information platform solution. SmarTranz provides ITS teams and travelers alike with easy-to-use, travel-related information and tools.

SmarTranz is comprised of Advanced Traveler Information Systems (ATIS) Software Products developed by urHub and the Revenue Product that enables The Hub Companies to provide Transportation Agencies with sustainable and cost-effective technology solutions.

ATIS Software Products

CloudLayerZ negates the need for expensive resources by ITS operations by employing cloud-based technology to manipulate map information. Information “layers” — speeds, road conditions, etc. — are selectable and can be provided real-time. This optimizes the user experience thereby delivering a more efficient and significantly less costly option for conveying map-based information.

CloudLayerZ is currently employed within the CDOT Mobile Application, which has more than 315,000 users.

SpeedZ is a compressed speed bar designed to provide an immediate impression of relative speeds on major and important stretches of highway. Because handheld’s are relatively small and cannot display miles of road in a single view, SpeedZ compresses segmented data points to specified areas yielding a color-coded display on a Smartphone.

FeedZ is an integrated technology services feature. All urHub platforms are built to integrate with a Transportation Agency’s legacy technologies and third party services. This means that a Transportation Agencies’ ITS group need not change the way they operate because the urHub platform can ingest any sort of feed: 5-1-1, RSS, TMS, TMC/TOC data, cameras, VMS, newsfeeds, weather, sensor data, XML, iCal (ICS), CCTV, ATR, Twitter, and other social media as well as custom feeds and all ITS information.

Revenue Product

The inline advertising product, RevenueZ, is a networked advertising management solution that provides for implementation, monitoring, and tracking of ads on mobile platforms.

It features:
- Responsive design — including sponsorship and banner advertising
- Motion and video capabilities
- Detailed and customized analytics
- A dedicated sales and servicing team to ensure advertising is sold; content is appropriately managed and monitored, and; revenue is collected

The Hub Companies is focused on bringing new and innovative technologies to the transportation sector. It believes that use and adoption of its SmarTranz suite of products by Transportation Agencies will assist in optimizing ITS resources and allow these agencies to provide additional, easy-to-use information to the traveler.

For more information visit www.hubcompanies.com.

Blue Earth’s Intelligent Digital Battery Technology Approved in Several States and Cities for Signalized Intersections

UPStealth™ Is an Environmentally Friendly, Digital Battery Backup System Currently Available to the Market, and Is Completely Recyclable With No Issues of Hazardous Out-Gassing, Corrosion, Flammable or Explosive Characteristics

Blue Earth, Inc., (OTCQB: BBLU) a renewable energy and energy efficiency services company, announced recently that its patent pending, intelligent digital battery backup system, designed and manufactured by its wholly-owned subsidiary, Blue Earth Energy Power Solutions, has been approved by several States and cities including Oregon Department of Transportation (“DOT”), Utah DOT, Idaho DOT, Alabama DOT, Colorado Region 5, City of Sacramento, CA, City of Camarillo, CA, City of Palmdale, CA, City of Pinebluff, AR, City of Bridgeport, CT, and the Washington DC lite rail, with several more states and cities in the final approval stage.
The UPStealth™ was created for signalized intersections when loss of utility power occurs. UPStealth™ can be formed in various configurations that allow the intelligent battery to bend around corners and fit into spaces that cannot be accessed by traditional battery backup systems. Compared to lead-acid batteries the UPStealth™ replaces, cost of ownership is less, requires less maintenance, and lasts several years longer. Blue Earth EPS offers a finance program, which allows states and municipalities to replace lead-acid battery systems without capital expenditures.

Adam Lough (Signal Engineer Utah DOT Region 3&4) states, “We absolutely love it. It has been rock solid, easy to use, easy to install, and fits great without taking up too much room. It is going to be a great solution for us where we don’t have the room or resources to install a UPS cabinet. I have talked to the other regions and we did a demo of it last month in our statewide meeting. Everyone loved it and wants to try them. The thing they all liked most is it is a ‘plug and play’ device requiring very little maintenance. We are also excited about the great warranty. We need to get it on the contract because there are a lot of locations throughout the state where these will come in very handy. We look forward to working with you as we deploy more of these units.”

According to industry sources, there are an estimated 313,000 signalized traffic intersections in the US and the market potential is approximately $453 million. That does not include other substantial potential vertical markets in traffic, such as railroad crossings, freeway ramp monitoring, school zone flashers, vehicle messaging signs, and other intelligent transportation applications. UPStealth™ is marketed by nine established distributors with a passion for what it offers the end consumers and who understand the weaknesses of lead-acid battery back up systems.

Debi Sadar (Lead Traffic Operations Engineer, Longmont, CO) states, “Here at the City of Longmont, CO we have been evaluating the use of battery backup systems for several years now on our signalized intersections but outfitting some of our intersections was costly due to the fact we needed to add on piggyback cabinets to accommodate the additional equipment needed. This was not only expensive but proved to be a hardship in some locations. The cabinets are where we would have a very hard time fitting in a piggyback cabinet without causing issues with pedestrians getting around them. We started hearing about the Stealth System approximately 3 years ago and decided to look into what it really consisted of. It kind of sounded a bit too good to be true. After attending a webinar we realized this UPS system is not only the correct choice for us because it eliminated the use of a piggyback cabinet but also did not use the lead-acid batteries which we preferred not to use for safety reasons.”

Blue Earth obtains the batteries from PowerGenix, which has developed and patented a high-power, low-cost Nickel-Zinc battery. The proprietary intelligent battery management software and form factors designed by Blue Earth EPS significantly enhance the performance of the Nickel-Zinc chemistry.

“We are delighted that knowledgeable and respected traffic engineers are embracing our UPStealth™ intelligent digital battery technology,” stated Tim Hysell, Corp. Sr. VP Technology and Program Group of Blue Earth, Inc. “We are also excited about the possibilities of marrying our intelligent digital battery technology and energy storage solutions with our patented energy management system to provide peak shaving energy savings for our thousands of customers.”

For more information please visit www.blueearthinc.com.

RTC Manufacturing Creates Drop-in Replacement Panel For Spot Devices Cabinets

To help municipalities with Spot Devices equipment in their school zone beacon network, RTC Manufacturing created a drop-in replacement panel that is fully functional with or without two-way communication devices. RTC’s turnkey solution is also compatible with the company’s remote management software, RTC Connect™.

In April Cirrus Systems notified customers with Spot Devices equipment that the flashers would function improperly without its software services, which were discontinued after June 30, 2014.

So that municipalities do not have to invest in an entirely new flasher system, RTC Manufacturing designed a drop-in panel for the Spot Devices cabinets that is simple and quick to install.

The replacement panel includes the following high-quality components from RTC:

- Reliable AP22 Time Switch, a calendar programmable solid state time switch
- Solar regulator
- Flasher circuitry
- Two-way communication devices, such as M2M or radio (optional)

New Products — cont. on page 44
NEW PRODUCTS — Continued

Other features of RTC Connect™, which are also free and have no annual fees, include:

- Color-coded calendar that provides quick visual reference to the school calendar
- Mapping of flasher locations in their exact location via GPS coordinates
- Data storage on Cloud/SQL server that allows access by multiple team members simultaneously with duplicate CSV files maintained on a central computer
- Archive of all communication for easy troubleshooting
- Quick override for today or tomorrow’s calendar for unexpected events, such as weather

For more information about the replacement panels or RTC Connect™, call (800) 782-8721 or email info@rtc-traffic.com. RTC Manufacturing is not in any way affiliated with Spot Devices or Cirrus Systems.

Blue Earth Energy Power Solutions Introduces UPStealth Inverter/Controller

Blue Earth Energy Power Solutions (BE EPS), the energy storage and battery backup division of Blue Earth Inc., is proud to introduce the UPStealth Inverter/Controller. The UPStealth Inverter/Controller is an intelligent digital management system, which works together with our unique UPStealth Battery Panels powered by Nickel Zinc chemistry.

BE EPS offers a family of UPStealth Batteries and Inverter/Controllers, which fit into 170/2070 33X series and NEMA traffic control cabinets. The portfolio of UPStealth Batteries and Inverter/Controllers all uniquely work together. A 170 Style “Living-Hinge UPStealth Battery Panel,” which bends to fit between the cabinet shell and cabinet rack, can be paired with the rack mountable “NEMA UPStealth Inverter/Controller.” Regardless of cabinet style, the 170 and NEMA style Batteries and Inverter/Controllers can be used together, truly allowing customers to mix and match Batteries and Inverter/Controllers to match their traffic cabinet footprint.

The UPStealth Inverter/Controller is an intelligent, Two-Stage Battery Backup System (BBS). Stage One runs continuously and protects against voltage spikes, current surges, and line noise. It also contains a transient protection circuit that guards against lightning strike damage. This protection circuit can handle 480 joules of energy and 39,000 Amps peak current.

Stage Two, is the digital sine wave monitoring system. This system models the incoming sine wave in real-time and detects sine wave abnormalities. User-settable thresholds allow the end-user to customize the sensitivity of the UPStealth to assure downstream equipment is completely protected from even the smallest power deviation. When the digital sine wave monitoring system detects an abnormality, the Inverter/Controller switches the intersection to battery backup and the triggering sine wave is stored in the Event Log memory along with a day-date stamp. Our newly-released Real-Time Intelligence Connect (RTi Connect) desktop application allows the end-user to view the Event Log, sine waves, and set voltage thresholds, battery depth of discharge (DOD) as well as any user-settings that can be set from the front panel of the UPStealth.

Eight user settable relays are available on the Inverter/Controller with Normally Open and Normally Closed contacts. These relays can be used to send a signal to put the intersection into flash, trigger an alarm or send a signal to the controller that can indicate intersection status and/or power outage conditions.

The relays can be programmed to trigger on the following conditions:

- Utility Power Failure
- Battery Capacity (Low Battery) 0–100% (Flash)
- Countdown timer (Flash)
- Time of Day
- Temperature
- UPStealth error condition

Using the UPStealth Real-Time Intelligence Connect (RTi Connect) communication to each intersection BBS can be handled by directly interacting with the Inverter/Controller on-site by connecting a laptop to the USB or Ethernet port on the front panel or remotely.
through standard internet protocols (TCP/IP). All pertinent information and UPStealth BBS functionality can be managed remotely, as if you are standing in front of the cabinet display. With your intranet/internet web browser, connect to your BBS from your Traffic Master Headquarters using the UPStealth Real-Time Intelligence WebConnect (RTi WebConnect), a web-based user interface that remotely allows you to manage performance parameters of your entire portfolio of UPStealth BBS.

For more information, visit www.BlueEarthEPS.com.

Blue Earth Power Solutions Offers Lead Acid-Free Battery Backup System

Blue Earth Energy Power Solutions (BE EPS), a division of Blue Earth Inc., is proud to offer the first-ever lead acid-free battery backup system for the traffic industry called the NEMA UltraPower-Stealth Battery Backup System (NEMA UPStealth).

The NEMA UPStealth, designed to run traffic intersections in the event of power failure, is a battery backup system that utilizes an environmentally friendly, non-corrosive, safe, and rechargeable chemistry called Nickel Zinc (NiZn). NiZn is 100% recyclable and RoHS compliant (Restrictions of Hazardous Substances). The NEMA UPStealth replaces current lead acid battery backup systems which have inherent deficiencies in the traffic industry: heavy, corrosiveness/hazmat issues, lack of reliability and performance, and continual ongoing maintenance.

The NEMA UPStealth Battery Panel was created to be housed discreetly inside the primary traffic cabinet in countless ways to cater to the customer’s cabinet footprint. This battery panel was designed to set on top or be installed under- earth the NEMA cabinet shelf, making this battery panel 19” EIA rack mountable. Furthermore, it eliminates the need for expensive external enclosures or piggyback cabinets. Providing twice the energy in half the space, the NEMA UPStealth is approximately 70% lighter in weight than a lead acid equivalent. The NEMA UPStealth comes in a 500 Watt design, with the ability to connect multiple panels to the Inverter/Controller to fulfill your required run times.

Reliability and intelligence is designed into every NEMA UPStealth system. The NEMA UPStealth has built-in chargers/monitor boards that provide quick four-hour recharge times regardless of how many battery packs are connected to the Inverter/Controller. Extreme weather conditions are not a factor either for the NEMA UPStealth; it can withstand -35°F/-37°C to 165°F/57°C. Battery Panels are also hotswappable, allow batteries to be added or taken away without powering off the traffic control system.

In addition, the NEMA UPStealth is a “Redundant Battery System,” which means it will continue to function even if a string of battery cells are compromised, which is unlike any lead acid battery backup system.

The NEMA UPStealth is ultimately controlled by the UPStealth Inverter/Controller. The NEMA UPStealth communicates with a PC using a USB port or optional Ethernet port. The main Inverter/Controller is able to turn any battery panel on or off. The UPStealth Inverter/Controller constantly monitors the AC line voltage and, in the event of a power failure, switches the cabinet power to the Inverter/Controller output in less than 8 milliseconds. The Inverter/Controller can connect to four battery panels with the optional hub that can connect 16 panels to one Inverter/Controller.

New Products — cont. on page 46
Skyline Products’ DMS to Help Improve Traffic Flow Across Arizona

Skyline Products recently announced they have renewed their statewide contract with the Arizona Department of Transportation (ADOT). Skyline will continue to be the provider for ADOT Dynamic Message Signs (DMS), both full color and amber.

The AZ statewide contract includes LED DMS in full color and amber for maximum flexibility. The full color DMS allows for more complex messaging, including graphics, while amber LED DMS is most commonly used for text messages, tolling, and travel time messaging. Skyline’s DMS utilize the highest quality amber and color LEDs available, providing uniform color and brightness for clear, legible messaging. Additionally, Skyline’s full-feedback technology lets you know signs are displaying correct messages at all times.

“The statewide contract with Arizona allows the DOT to have DMS that have been proven to work for transportation systems across America as well as gain the advanced functionality and dependability for which Skyline is known,” says Chip Stadjuhar, President and CEO of Skyline Products.

Skyline has been manufacturing ITS-grade® DMS since 1971 and ITS-grade LED DMS since 1994. With over 2,600 ITS-grade LED DMS installed across North America, Skyline is an industry leader and considered to produce the most legible and reliable LED DMS in the industry. Products include LED DMS, Rotary Drum CMS, Scrolling Film CMS, and EnvoyDMS Central Control Software. Skyline’s LED DMS are available in amber and full color with both Walk-in and Lift-face configurations. The central control software, EnvoyDMS, is an extremely robust, easy-to-use, NTCIP-compliant sign control software solution, compatible with all DMS.

For more information about Skyline Products please visit www.skylineproducts.com.

RTC Manufacturing Sees Increase in Demand for M2M Communication Devices

Traffic Safety Officials Falling in Love with M2M’s Advantages

During the last year, Ron Featherston of RTC Manufacturing has seen an uptick in the deployment and testing of M2M communication devices in school zone flashers and warning Beacons. But he’s not surprised.

“It has so many benefits over other methods,” he explains. “M2M provides two-way communication, so you can remotely operate a flasher and verify it’s working instead of sending someone into the field, which costs time and money.”

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BE EPS offers a family of UPStealth batteries and Inverter/Controllers, 170 and NEMA style battery backup systems with both configurations designed to work together. In other words, you can use the 170 style “Living-Hinge UPStealth” and the NEMA style “NEMA UPStealth” battery panels and Inverter/Controllers together in any cabinet, regardless of cabinet type, truly allowing customers to mix and match batteries and Inverter/Controllers to be configured to their traffic cabinet footprint.

For more information, visit www.BlueEarthEPS.com.
For almost 50 years, ELTEC has been in business designing and manufacturing programmable time clocks and traffic warning systems (AC and DC/solar). We’ll be here to provide service/support and to supply parts that keep your systems up and running.

Contact ELTEC to:

- **RETROFIT**: use existing parts and components
- **UPDATE**: outdated systems
- **REDESIGN**: failed systems or failed components
- **REPLACE**: out of business manufacturer or obsolete equipment

We’ll work with you to resolve your needs. For a quote, call or e-mail us today.
Even better, he says, M2M is not a line-of-sight technology like radio, which means topography is no longer an obstacle when trying to communicate with devices across long distances.

Many municipalities are finding M2M more cost-effective for flashers that are located miles — sometimes even hundreds of miles — from their offices, like the Colorado Department of Transportation office in Greeley.

This summer they called on RTC distributor Traffic Signal Controls in Longmont, CO, to install M2M devices in school zone flashers about 50 miles away from Greeley in Estes Park. To achieve the same result with a radio setup, the office would have to put repeater beacons every five to ten miles because of radio’s reliance on a clear line of sight.

Other organizations turn to M2M because of its ability to operate in hilly terrain. In June the Austin office of the Texas Department of Transportation switched from ineffective AM radio communication to M2M in warning flashers in Enchanted Rock State Park.

There are others who love the ease and flexibility the M2M communication system offers. RTC distributor Western Systems out of Everett, WA, recently installed M2M devices in flashers around AT&T Park in San Francisco to ease congestion during baseball games. With M2M, traffic officials can quickly turn on the flashers when needed on game days.

But all of these benefits of M2M communication would not be possible without management software. To help traffic safety personnel maximize M2M’s capabilities, the company created RTC Connect™, the premier platform that allows multiple users to program, update, and initiate special operations of time switches in real time.

For more information about M2M communication or the RTC Connect™ software, call (800) 782-8721 or email info@rtc-traffic.com.

Consolidated Traffic Controls Launches Traffic Signal Cabinet Training Program

Technicians Leave Mobile Learning Lab With Improved Troubleshooting Skills

Consolidated Traffic Controls (CTC) out of Arlington, TX, created the Traffic Signal Cabinet Mobile Learning Lab this year to empower traffic signal technicians with the skills and troubleshooting methods needed to keep their communities safe. The lab provides a hands-on, two-day training program in a personal, intimate atmosphere as it travels across Texas, Oklahoma, and New Mexico.

The training was originally created for newcomers with two years of experience or less. However, CTC’s experienced program leaders, Les Trammell and Patrick Walker, found that even people with 20 years of practice were walking away from the class with nuggets of wisdom.

“Most people said they were amazed at the amount of knowledge they gained,” Trammell shared. With overwhelming positive feedback since the program’s inception in April, classes have been selling out quickly.

The training — which is a steal at $295 per person — provides a strong foundation, starting with electricity fundamentals and major components in a NEMA cabinet, to help participants understand the reasoning behind everything they do.

“The technicians said we pieced a lot of the puzzle together for them so they’re able to troubleshoot better,” Trammell explained. CTC’s emphasis on the problem-solving process helps participants walk away with an efficient, effective workflow.

Haltom City’s Jonathan Elliott, who attended the class, agreed.

“With multiple systems installed across municipalities, traffic technicians can easily be confused and overwhelmed when trying to troubleshoot,” Elliott said. “But with the hands-on training and support at the lab, I’m now able to look in a cabinet and diagnose, isolate, and repair problems with confidence.”

For more information visit www.ctc-traffic.com.

Massachusetts Department of Transportation Picks Trafficware’s SynchroGreen

Trafficware Group, Inc. recently announced that MassDOT selected SynchroGreen for the state’s first adaptive signal system. With traffic engineering involvement from consulting firm VHB, the new adaptive signal system was activated on March 31 and included four intersections on Elliot St. in Danvers, MA.

“The corridor selected was a common bypass route where unpredictable traffic demand occurs; also
backups regularly occurred on this corridor, causing substantial queuing onto the freeway,” commented Alan Deditch, President of Highway Tech, provider of on-street system support. “SynchroGreen was the perfect solution to respond to the influx of traffic and representatives of MassDOT and I have already seen a significant improvement,” added Deditch.

Video cameras located at the intersection provide real-time traffic volumes to on-street traffic controllers. The system then uses a centralized command and control server to process this data (volume/occupancy) to analyze and dynamically adjust phase timings, offsets, and cycle lengths continuously in real time. This results in signal timings that adjust every cycle to the fluctuating demands of traffic volumes to optimize the flow of traffic.

One of the features of SynchroGreen that MassDOT found appealing was the ability to have the option of hitting the “easy button” for default settings or providing more detailed inputs to refine the system operation. This level of flexibility allows the state to deploy a system like SynchroGreen in both a smaller city where there are little local resources to manage the system, and in larger cities, where there may be specific traffic dynamics that require a more tailored approach.

“Through our suite of Synchro traffic optimization products, including SynchroGreen, Trafficware has made a real commitment over the last decade to getting the most out of an agency’s existing infrastructure,” commented Jon Newhard, CEO of Trafficware. “It’s gratifying for an agency to deploy SynchroGreen, something that motorists notice immediately and appreciate.”

To learn more about SynchroGreen real-time adaptive signal control technology visit www.trafficware.com.

**Auburn Goes “Hands Free” in Programming School Clocks**

The City of Auburn, WA decided to update their 43 school zone flashing beacons (AC and solar powered) from manual programming of clocks (NTC-17E) to a new Internet Protocol (IP) time clock. Now each time clock is programmed, controlled, and monitored from a central computer with ELTEC’s SYSTEM 3000.

According to Mark Bjork, Traffic Operations Technician, when considering a new IP addressable time clock, Auburn’s engineers didn’t want to be “tied to any bills that could be raised in the future or one [clock/system] that could ‘fall off the face of the earth.’ It had to be something they could internally maintain.”

Any system under consideration had to prove to their IT department that it’s secure in allowing communication/data transfer to come through the city’s firewall and it doesn’t usurp the school’s network. ELTEC’s SYSTEM 3000 was tested and met security requirements along with no re-occurring charges. The

DLPRO 3000 software is owned by the end-user and has no annual fees.

Twelve Local Area Network Gateways (LANG) were installed in traffic signal cabinets. The LANG 3000 plugs into a fiber switch in each cabinet connecting to the city’s ITS network. An antenna is connected to the LANG 3000 (gateway) and mounted on the signal pole, communicating via spread spectrum radio to clocks in the area. In two locations, a TC-3000 time clock also acts as a repeater to allow communications with another

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Outgoing IMSA President Jeff Knight (right) passes the torch to incoming President Mike Flanigan (left).
clock that would otherwise be out of range of the gate-
way.

In the Lea Hill area, where no city fiber or copper
connections are available, an outside VPN used for a
traffic camera is utilized. It connects directly to the
LANG 3000. It’s outside of the ITS (intranet) system,
but on the host computer it’s transparent. The software
doesn’t know or show any differences.

For information go to www.ELTECCORP.com.

Siemens Tests eHighway System in
California

• Siemens sets up demonstration project in
  conjunction with Volvo
• Electrified trucks designed to cut air pollution in
  California
• Test results available in summer 2016

Siemens will conduct trials on a two-mile stretch of
highway after installing a catenary system for electric
and hybrid trucks in the vicinity of the largest US ports
of Los Angeles and Long Beach. The company was
awarded the associated contract by Southern Califor-
nia’s South Coast Air Quality Management District
(SCAQMD). The objective is to completely eliminate
local emissions, such as nitrogen oxides, to reduce the
consumption of fossil fuels, and cut the operating costs
of trucks. The test results should be available in the
summer of 2016, and will indicate the suitability of the
systems for future commercial use. The ports of Los An-
geles and Long Beach are seeking an emission-free sol-
ution (“Zero Emission I-710 Project”) for a section of
Highway 710, which carries a high proportion of shut-
tle truck traffic. The 30 kilometer route links the two
ocean ports and the railroad transshipment centers
inland.

As part of the installation of the eHighway systems,
two lanes of Alameda Street in the city of Carson, CA,
are being electrified via a catenary system. On the road,
E-trucks equipped with hybrid drive and smart current
collectors will be supplied with electricity from catenar-
ies, offering local zero-emission operation. In conjunc-

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MISSING ACCESS COVERS ON LIGHT POLES ARE DANGEROUS
BUT THERE IS A SIMPLE, EASY SOLUTION.

The Access Ready Panel is the perfect answer when the original
cover on a street light pole is missing or cannot be reinstalled.
Available in any color, it installs in seconds, requires no tools and
includes tamper-resistant locks.

September/October 2014
Award Presentations from the 2014 Annual Conference and School

Ron Whitelock (right) receives the IMSA Journal Award from IMSA President Jeff Knight (left).

Clarence Chance from the Far Western Section receives the Educational Foundation Section Certification Excellence Award from IMSA Educational Foundation President Ted Gilfert.

Alan Domsky, Arizona Section, received the Special Service Award. Accepting for Alan was Gus Woodman, delegate from the Arizona Section.

Perry Hill accepts the Outstanding Section Award given to the Atlantic Section.

The Outstanding Section Secretary Award was given to Lisa Ridge, Indiana Section.

Lenny Addair, Jr. accepts the Outstanding Member of IMSA Governance Award.

The Outstanding Volunteer Award was given to Belinda Younger-Gurley, Southwest Section.

George Baureko, Jr. accepts the Outstanding Certification Award for the New Jersey Section.

Wayne Bryan, Florida Section Secretary/Treasurer accepts a TARP award on behalf of Gary Scheuring.

Your Partner in PUBLIC SAFETY
The Northwest Section was recognized for its excellence and leadership in earning TARP points. Accepting the award from President Jeff Knight on behalf of his section was Fred Housman, Section Delegate.
Scenes from the 2014 Annual Conference and School
INTERFACE COMMUNICATIONS CO.
SIGNALIZATION TECHNICIAN — LEVEL II

LOCATION: DENVER METRO AREA
Denver offers 300 days of sunshine, a thriving cultural scene, diverse neighborhoods, and natural beauty combine for a most spectacular playground. This young, active city is located at the base of the Colorado Rocky Mountains. Known for its stunning architecture, award-winning dining, professional sports teams, and unparalleled views, it offers a great living environment.

PRINCIPLE PURPOSE OF JOB:
Understands and has the ability to perform all aspects of constructing a complete traffic signal intersection to include cabinets, fire preemption, microwave detection, loop detection, camera detection, terminations, and testing.

ESSENTIAL JOB FUNCTIONS:
Performs the proper installation of:
- Signals
- Push buttons
- Foundations
- Loops
- Radio communications
- Variable message signs
- Weather stations
- Minor equipment and vehicle maintenance

- Pedestrian heads
- Traffic poles
- Cameras
- Microwave detectors
- Traffic cabinets
- Overhead sign cantilevers and sign panels

MINIMUM QUALIFICATIONS:
- Cleaning Driving Record
- Able to lift up to 70 lbs.
- Consistent Work History
- Field Electrician Certification
- Work Zone Traffic Safety Certification
- Competent Person Training
- Fluent in the operation of the following equipment:
  - Backhoes
  - Trenchers
  - Tampers
  - Bucket Trucks
  - Aerial Lifts
  - Class A CDL (preferred)

PAY RATE:
SALARY RANGE: $20.00–$25.00 hourly
*SIGNING BONUS*
Company will consider assisting in moving expenses.

COMPANY INFORMATION:
INTERFACE COMMUNICATIONS
Human Resources- 303-530-4212
http://www.interface.cc/traffic.html

TO APPLY:
Email Resume to employment@interface.cc
INTERFACE COMMUNICATIONS CO.  
SIGNALIZATION PROJECT MANAGER

LOCATION: DENVER METRO AREA
Denver offers 300 days of sunshine, a thriving cultural scene, diverse neighborhoods, and natural beauty combine for a most spectacular playground. This young, active city is located at the base of the Colorado Rocky Mountains. Known for its stunning architecture, award-winning dining, professional sports teams, and unparalleled views, it offers a great living environment.

PRINCIPLE PURPOSE OF JOB:
Responsible for coordinating manpower, equipment and materials for the complete installation and operation for traffic signal systems, weather sensing systems, highway signing projects, lighting systems and variable message signs with the appropriate governing entity or prime contractor. Responsible for overseeing training of signal crews in proper application of rules and regulations. Responsible for apprentice technicians, laborers and project managers will less seniority. Authorities to coach, reprimand, and terminate subordinates without consultation if action warrants. Work is performed with limited supervision.

ESSENTIAL JOB FUNCTIONS:
- Project management
- Equipment rentals
- Manpower scheduling
- Jobsite safety
- Inspections
- Equipment maintenance
- Project coordination
- Subcontractor scheduling
- Material scheduling
- Field training
- Project productivity
- Vehicle maintenance

MINIMUM QUALIFICATIONS:
- Minimum Level II Traffic Signal Technician
- Field Electrician Certification
- Work Zone Traffic Safety Certification
- Erosion Control Certification
- Level I Certification
- Competent Person Training
- Bench Technician (Preferred)
- Able to lift up to 100 lbs.
- Minimum of a class A CDL
- Fluent in the operation of the following equipment: Backhoes, Skidsteers, Trenchers, Pneumatic, Moles, Tamper, Excavators, Bucket Trucks, Crane Trucks, and Aerial Lifts

PAY RATE:
SALARY RANGE: $22.00–$30.00 HOURLY
*SIGNING BONUS*
Company will consider assisting in moving expenses.

COMPANY INFORMATION:
INTERFACE COMMUNICATIONS
Human Resources: 303-530-4212
http://www.interface.cc/traffic.html

TO APPLY:
Email Resume to employment@interface.cc

INTERFACE COMMUNICATIONS CO.  
TRAFFIC SIGNAL APPRENTICE — LEVEL I

LOCATION: DENVER METRO AREA
Denver offers 300 days of sunshine, a thriving cultural scene, diverse neighborhoods, and natural beauty combine for a most spectacular playground. This young, active city is located at the base of the Colorado Rocky Mountains. Known for its stunning architecture, award-winning dining, professional sports teams, and unparalleled views, it offers a great living environment.

PRINCIPLE PURPOSE OF JOB:

ESSENTIAL JOB FUNCTIONS:
Provide the necessary physical labor assisting in installation of:
- Underground conduit
- Pull boxes
- Caissons
- Foundations
- Poles
- Structures
- Towers
- Signs to facilitate a complete operation system
- Expectation of acquiring a Level II Traffic Signal Technician Certification

MINIMUM QUALIFICATIONS:
- Cleaning Driving Record – Less than 5 points, no previous DUI’s
- Clean Criminal Background
- Able to lift up to 100 lbs.
- Consistent Work History
- Ability to obtain the following certificates:
  - Minimum Level II Signal Technician
  - Field Electrician Certification
  - Work Zone Traffic Safety Certification
  - Erosion Control
  - Competent Person Training
  - Bench Technician

Ability to become fluent in the operation of the following equipment:
- Backhoes
- Trenchers
- Excavators
- Digger/Crane Trucks
- Class B CDL within 6 months
- Skidsteers
- Compaction Devices
- Bucket Trucks
- Aerial Lifts
- Class A CDL within 12 months

PAY RATE:
SALARY RANGE: $15.00–$19.00 HOURLY

COMPANY INFORMATION:
INTERFACE COMMUNICATIONS
Human Resources: 303-530-4212
http://www.interface.cc/traffic.html

TO APPLY:
Email Resume to employment@interface.cc
FIELD TECHNICIAN

Are you a technically savvy Field Technician with experience in sales as well as being technically knowledgeable of products that you represent? Econolite is offering a position that will give you the best of both worlds! Being able to work in the field in the capacity of a Technician, however, having the skill set of selling, training and providing alternative solutions with Econolite products!

Econolite is looking for a Field Technician that can provide technical customer support for the Econolite Product Line to local and Government Agencies and Contractors. Knowledgeable in systems installation and set-up with agencies trainings on our products and must have the continuous effort to train on all traffic control equipment. Some of our core duties are as follows:

Proficient in traffic equipment installations and troubleshooting including (but not limited to) traffic cabinets, traffic controllers, video detection and radar detection. Ability to read and comprehend technical manuals/documents

Provide service and customer support during field visits. As well as provide technical support via phone and email

Serves as a proactive customer service & quality ambassador of The Econolite Group, Inc. by representing the organization in a positive, professional manner to support The Brand Promise

Minimum qualifications for this position will require the following but not limited to:

Minimum two year degree in electronics or comparable work experience
Computer literate in the following software: Microsoft Office Suite, Windows Operating Systems, Microsoft Dynamics CRM (C4), Applicable Utilities for troubleshooting (i.e. Packet Sniffers, Terminal Emulators, etc.)
IMSA Traffic Signal Field Technician certification (IMSA Level 2) within six months of hire

For a complete list of duties and qualifications, please visit our Careers page at www.econolitegroup.com/careers
Econolite Group, Inc. is an Equal Opportunity/Affirmative Action Employer.
### CITY OF MIDLAND
**Traffic Signal Technician**
The City Of Midland is now accepting applications for Traffic Signal Technician in the Transportation Division. This position will install, operate, and maintain all electrical traffic control devices, continuous roadway lighting, early warning siren system and associated equipment. A high school diploma or equivalent with 1–3 years experience in installation, maintenance, and repair of traffic control devices. Required certifications are IMSA Traffic Signal Technician Level 2, Work Zone Traffic Control, and IMSA Roadway Lighting Level 1. Valid Texas Class “A” or “B” CDL driver’s license required. Class “A” preferred. Monday–Friday 7:30–4:00 p.m.; Rotating on-call/standby after hours. Submit resumes online at www.midland-texas.gov EOE

### GLYNN COUNTY
**Traffic Signal Technician**
The Glynn County Board of Commissioners is accepting applications for the position of Traffic Signal Technician. This position is responsible for performing specialized work involving installation and maintenance of traffic signals, road signs, and pavement markings. High school diploma or GED; supplemented by vocational training in traffic control systems, traffic safety, and traffic sign construction/installation; supplemented by five months previous experience or training involving traffic control systems, traffic safety, traffic sign construction, and general construction trades. Must possess or obtain valid Georgia Department of Transportation Flagger certification, IMSA Work Zone certification, IMSA Level I Traffic Signal certification and Level I Signs certification during the first year of employment. Valid Driver’s License required. Salary Range: $26,820–$32,184 DOQ. Please visit our website at www.glynncounty.org for an application.

### CITY OF ALPHARETTA
**Traffic Signal Engineer**
**Salary Range:** $60,000/yr.–$75,000/yr. plus excellent benefits
Under administrative direction of the Traffic Operations Manager, reviews and participates in the more complex and difficult work of staff responsible for performing professional level duties in support of the City’s Traffic Group within Public Works including the development, review, coordination, and planning of municipal traffic systems; operation and maintenance of the traffic control center, traffic signal timing, and operations; ensures work quality and adherence to established policies and procedures; and responds to questions and inquiries from the general public, developers, contractors, engineering professionals, and City staff regarding engineering and development projects.

Please check out our City website at www.alpharetta.ga.us, click on the employment tab for additional information.

### BROWN TRAFFIC PRODUCTS, INC.
**Position:** Intelligent Traffic Systems (ITS) Technician
**Location:** Davenport, Iowa
**Description:** Brown Traffic Products is currently looking for an experienced Intelligent Traffic Systems (ITS) Technician who will be responsible for diagnosing, trouble shooting, and repairing complex electronic ITS and communication systems, and evaluating equipment problems by interpreting blue prints, schematics, and wiring diagrams. This position will service products from Brown Traffic as well as those from other manufacturers. Our ideal candidate must be able to modify or construct new ITS equipment and work independently and under the supervision of a technical supervisor.

Brown Traffic Products is headquartered in Davenport, Iowa and provides service in a Midwestern 7 state territory (SD, ND, IA, IL, NE, MN and MO). The location of this position has some flexibility.

Required skills and qualifications, a more comprehensive job function list, and a link to apply for this opening, can be found at http://hiring.accolo.com/job.htm?id=341602461.

Brown Traffic Products, Inc. is an equal opportunity employer and requires pre-employment drug testing and background check. For more information about Brown, please visit us at http://browntraffic.com.

### EPCOR TECHNOLOGIES
**Manager, ITS**
EPCOR Technologies is looking for a Manager, Intelligent Transportation Systems (ITS). Accountable for the overall growth, development and performance of the ITS engineering team, the Manager, ITS will be a Professional Engineer with 8 years of experience in systems engineering. Please visit www.epcor.com/careers for more details and to apply.
The International Office of IMSA has established a program to assist unemployed members in securing employment. This service is being offered only to IMSA members. There is no charge for the listing and your notice will be run in the IMSA Journal for three consecutive issues. This service may be used only once each calendar year or until the service is withdrawn. All contacts will be made directly to you by interested parties.

Complete the form at right and return to: IMSA ATTN: IMSA Job Mart, 597 Haverty Court, Suite 100, Rockledge, FL 32955-3613, or email the information to jobmart@imsasafety.org.

The International Office, Board of Directors, and staff assume no responsibility or liability in this matter. IMSA reserves the right to edit the entry to conform to style.

Also, for up-to-date listings on job opportunities, visit our website at www.IMSAsafety.org and click on “Job Opportunities,” found on the left side of your screen. There you will find all current job listings.
Welcome New Members

Don’t forget to pass on the IMSA Membership Application!
Find it on the web at: www.destek.net/imsa/membershipapplication.html

Arizona
Aspuro, Jose
Beal, Kasey
Borja, Mario
Borquez, Jesse
Brito, Erik
Broersma, Dameon
Christie, Vincent
DeGroot, Riley
Devins, Jesse
Duran, Joseph
Durazo, Crisoforo
Frago, Nathan
Gonzales, John Daniel
Goodman, Jr., Wayne
Goodwin, Richard
Gutierrez, Donald
Handley, Clinton
Higginson, Darin
Laborin, Mark
Lewis, Stephen
Madrid, Roy
McCarthy, T.L.
Navarro, Luis
O’Flaherty, Hannah
Padilla, Miguel
Patrick, Gregory
Ramirez, Marco
Ratliff, Il, Kevin
Reyes, Julian
Saenz, Jr., Cosme
Sauzedo, Ricardo
Shepard, Adam
Silcox, Derek
Stoneburner, Phillip
Suell, Derek
Thompson, Dean
Warren, Joshua
Wood, Brian

Atlantic
Bodnarchuk, Steven
Doiron, Jules
Duke, Corey
Gagnon, Joel
MacCormac, Michelle
Martini, Mike
Newhook, Corey
Nickerson, Alison
Thomas, Dave
Turgeo, Mathieu

British Columbia
Bentley, Andrew
Curley, Drew
DeGraff, John
Ellery, Lawrence
Empey, Clifford
Goulding, Daniel
Hirschorn, Kyle
Johnson, Joel
Johnstone, Chris
Joslin, Shaun
Keen, Geoff
Kolberg, Brian
Laengta, Robert
Lowden, Allison
Matthews, Richard
Morgan, Ron
Moss, Prentice
Nowicki, Brad
Paulson, Luke
Pekrut, Suzana
Raposo, Jason
Slader, Geoff
Tremblay, Marc
Tunshell, Stefan
Vandermark, Josh

Canadian Prairie
Acharya, Bishal
Dorcelly, Herby
Fuller, Ben
Kabouch, Mohamed
Muhammad, Hayat

Central
Bradshaw, Mark
Crawshaw, Andrew
Hazen, John
Miller, Mark E.
Moore, Ryan
Ramos, Javier

Far Western
Anderson, Richard
Bailey, Joshua
Cook, Dave
Delauber, David
Escarega, Ed
Hamasaka, Matthew
Herin, Kenneth
Horton, Keith
Keck, James David
Masse, Amber
Morgan, Mike
Newman, Jeremiah
Ortiz, Fremito
Ragan, Ryan
Rojas, Miguel
Scott, David
Taylor, Adam
Wilson, Todd

Florida
Buckland, Daniel
Capobianco, Jr., Ron
Guthrie, Michael
Johnson, James
Lopez, Juan
Mundkur, Dilip
Snyder, Brian

Great Basin
Tillman, Kimberley
Torres, Lauren
Weerasuriya, Sujeeva

Indiana
Woolding, Kevin

International
Ayers, William
Banko, Josh
Bridgett, Travis
Carias, Imer
Centeno, Marvin
Clatterbuck, Steve
Dixon, Charles
Dolbeer, Gregg
Dovi, Michael
Downing, Michael
Jordan, Brandon
Jordan, Cory
Lamie, William
Leake, Ryan
Lewellen, Peter
Merritt, James
Merritt, Thomas
Pless, James
Schlafer, Russell
Settlemyre, Michael
Swift, Stuart
Tabor, Darren
Whitehead, Edward

Midwest
Bartels, Matthew
Blaha, Steven
Bowen, Roger
Bush, James
Carrillo, Alex
Cleek, Sean
Daniels, Henry
Evans, David
Feltes, Matthew
Fenwick, Mike
Flinn, Zachary
Foli, Michael
Guerra, Marco
Hahn, John
Henze, Steve
Hernandez, Michael
Jansen, Travis
Jones, Jason
Knight, Ray
Lowitaki, Christopher
Maki, Jr., Paul
Ness, David
Otterson, Mark
Roberts, Andre
Roe, Cody
Schildt, Ronald
Strasser, Steve
Webb, Linda
Welch, Christopher

New England
Bates, John
Corbin, Bruce
Doherty, Michael
Romeo, Christopher

New Jersey
Fino, Joshua
Heasley, Tim K.
Kobel, Gregory
McElroy, Michael
Rivera, Julio

New York State
Basantes, Edwin
Basik, David
Bautista, Patricia
Bland, Gregory
Caputo, Steven
Castillo, Cesar
Chea, Jr., Julio
D’Ambrosio, Vincent
Dos Santos, John
Florian, Jose
Gmelin, Sr., Kevin
Hodge, Teresa
Hurlburt, Bradley
Kalmring, Peter
Kenealy, William
Lugo, Ceferina
McMonegal, Brian
Mulderrig, Kevin
Oravec, Richard
Pellettiere, Michael
Perone, Christopher
Santucci, Paul
Schlichtweg, Il, William
Thakurdeen, Tribeni
Valiente, Oscar

Northwest
Ensr, Mark
Hansen, Lee
Jones, Craig
Loyd, Timothy
Mahle, Josh
Mahmoud, Jamal
Martinez, Jr., Johnny
Tuly, Asma

Ontario
Agro, Charles
Crumb, Zackary

Southwestern
Briggs, JacQues
Covarrubias, Adolfo
Goodly, Shawn
Kelley, John
Nix, Joe
Soto, Miguel
Watson, David

Tri-State
Alelesh, Harold
Blankenship, Steven W.
Broyles, Ryan
Craig, Allen
Davenport, II, Douglas
Hall, Spencer D.
Koch, Scott
O’Bryan, Jason
Romask, Tim
Ross, Brian

Sustaining
Mississauga Training Consultants
Graham, William

New Sustaining Members with Existing Companies
McCain, Inc.
Reddan, Trisha
Struthers-Dunn
Mioduski, David
Moore, David
MEMBERSHIP APPLICATION

Apply and submit payment online at www.IMSAsafety.org or mail, fax or email this form.

<table>
<thead>
<tr>
<th>Prefix (Mr., Ms., Mrs.)</th>
<th>First Name</th>
<th>M.I.</th>
<th>Last Name</th>
<th>Suffix (Jr., Sr., III, etc.)</th>
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<th>City</th>
<th>Province/State</th>
<th>Postal Code</th>
<th>Country</th>
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<td>Work Fax</td>
<td>email Address</td>
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<tr>
<td>Home Phone (Optional)</td>
<td>Cell Phone (Optional)</td>
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<td>Home Address</td>
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<td>Province/State</td>
<td>Postal Code</td>
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</table>

Preferred Billing Address:  ❑ Work  ❑ Home
Preferred Mailing Address:  ❑ Work  ❑ Home

MEMBERSHIP CLASS

❑ ACTIVE  Employee or official of a Government agency or employee of a private contractor actively involved with public safety systems or operations.  Annual Dues (In US Funds)  $85.00

❑ PUBLIC AGENCY  Any Governmental body or agency with three (3) or more personnel who qualify for active membership. All personnel must be affiliated with a single agency or body, not private sector.  $75.00 Per Member

❑ ASSOCIATE  Individuals not eligible for active membership or those associated with commercial or non-profit organizations who have knowledge, experience or interest in public safety.  $85.00

❑ STUDENT  Full-time students of an accredited college or university enrolled in a field related to IMSA activities.  $35.00

Name of School _____________________________________________________________________ Projected Date of Graduation __________

Prefix (Mr., Ms., Mrs.)                First Name                                                M.I.                                                Last Name                                             Suffix (Jr., Sr., III, etc.)
Informal First Name                                                                                      Job Title
Organization                                                                                                  Department
Work Address
City                                                                                                                Province/State                               Postal Code                                                                   Country
Work Phone                                                                                                   Work Fax                                       email Address
Home Phone (Optional)                                                                                 Cell Phone (Optional)                         SSN#/SI#
Home Address

Preferred Billing Address:  ❑ Work  ❑ Home
Preferred Mailing Address:  ❑ Work  ❑ Home

AREAS OF INTEREST

❑ FCC Licensing and Frequency Coordination  ❑ Public Reporting Systems  ❑ Traffic Signal Inspection
❑ Fiber Optics                             ❑ Public Safety Telecommunications  ❑ Traffic Signal Systems
❑ Interior Fire Alarm Systems              ❑ Roadway Lighting                  ❑ Wireless Data
❑ Land Mobile Radio                        ❑ Sign and Pavement Marking         ❑ Work Zone Temporary Traffic Safety

METHOD OF PAYMENT

❑ Check Enclosed. Check # __________ Amount $ __________ ❑ Bill Agency/Organization (Attach Purchase Order) P.O. # __________

(If payment is for multiple personnel, please indicate individual member names on check or PO.)

Credit card payment (American Express, VISA, MasterCard or Discover) can be submitted online: www.IMSAsafety.org

Signature of Applicant _________________________________________________________________________________ Date _______________

PLEASE INDICATE HOW YOU LEARNED ABOUT IMSA:

❑ From time to time IMSA and the IMSA Sections may contact you by email regarding issues and activities that may be of interest to you. If you do not wish to receive emails, please check this box.

Questions? Call 1-800-723-4672 or email Membership@IMSAsafety.org.

IMSA  597 Haverty Court, Suite 100, Rockledge, FL 32955-3613
(321) 392-0500 • Fax (321) 806-1400 • www.IMSAsafety.org
Another IMSA conference is behind us! While I have attended a great number of IMSA conferences as an exhibitor, this was my first one “behind the wheel.” Putting on a conference is a lot of work, involving a great deal of planning and long hours. To those who volunteered to make Schaumburg a success, my heartfelt appreciation and thanks!

There were a number of conference highlights and new events at this year’s conference:

- Seventeen Certification Schools, including Work Zone, Traffic Signal, Traffic Signal Inspector, Roadway Lighting, Sign and Pavement Marking, and Fiber Optics;
- 55 Technical Sessions on a large variety of topics;
- Active discussions and participation on the “business” side of IMSA, including the Council of Delegates and the Joint Board of Directors/ Council of Delegates meetings;
- The largest exhibit hall in our history, giving our attendees the ability to see the latest offerings from our valued sustaining companies.

While the attendees worked hard expanding their knowledge base, we also had fun. I am positive anyone who attended the Taste of Chicago Theme Night will never forget it. 25 or 6 to 4, The Chicago Experience, put on an amazing show for all attendees, while the night provided an outstanding networking opportunity. The highlight of the evening was when President Jeff Knight was placed behind the drums and proceeded to absolutely stun and amaze us with his unbelievable drum solo, which brought the house down!

The exhibit hall was the best showcase of the industries’ offerings during my two decades as an IMSA member. With the largest space we have ever had, our exhibitors really came through with outstanding booths. We had vehicles inside the exhibit hall for the first time. It was awesome to walk through the exhibit hall right before opening and see it in all its grandeur, with buckets in the air and portable signals raised.

The conference provided numerous opportunities for exchange of ideas, thoughts and concerns member-to-member, member-to-leadership, and leadership-to-leadership. As an example, the certification forum had a tremendous number of ideas on how to move forward with the Traffic Signal Inspector Level II program.

Several new features to the conference included a Past President’s, Council of Delegates, Board of Directors, and Staff reception. This reception enabled the IMSA Leadership to interact and discuss the issues at hand for IMSA. Another new feature was the IMSA Section President’s Networking event. This event offered Section Presidents the ability to discuss the challenges and successes they are experiencing at the section level. I look forward to including both of these successful events in future conferences.

We are really “jazzed” to be going to New Orleans in 2015. The Southwest Section is looking forward to hosting us and we are expecting a stellar conference. Mark your calendar now to join us August 22 thru 25 at the Hyatt Regency in New Orleans!
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