Developing, Implementing, and Evaluating a Traffic Monitoring and Communication System for the City of Valdosta and Its Communities to Improve Safety, Connectivity, and Efficiency

Georgia Smart Communities Challenge 2020

Region

"A Georgia Community"

Proposal Government Lead

City of Valdosta, GA

In Collaboration With

Georgia Institute of Technology

Valdosta State University

Lowndes County, GA

Temple Inc.

Applied Information, Inc.

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1 Project Narrative

The focus of this Georgia Smart Community Challenge Grant is to create new capabilities for the City of Valdosta's Traffic Management Center (TMC). The overall objective is to inform and engage Valdosta communities in the decision-making process for enhancing public road safety and improving traffic flow. Real-time features of the new system are envisioned to create a new platform for community stakeholders (e.g., first respondents, pedestrians, bikers, and vehicle drivers) to communicate with each other and with the City traffic operations center. Establishing a connected traffic operations platform will simultaneously transform Valdosta into one of Georgia's first Smart Cities outside the metro Atlanta area, where 100% of its 128 major traffic intersections will be connected to a smart traffic system, and incorporate TravelSafely, a connected vehicle mobile application for smartphone devices. By installing in-vehicle pre-emption hardware and software (with real-time communication capabilities at all traffic intersections) into 10 of City's fire trucks during this project (which is phase I of a more-ambitious smart city initiative), the city's emergency vehicles will receive preempted green lights upon approaching an intersection, resulting in substantial reduction of emergency response times. The City's prior investment in traffic engineering software and hardware will exponentially assist the project plan. The proposed technology upgrade will transform Valdosta into a smart and connected city.

In collaboration with Georgia Tech (GT) and the City of Valdosta, research will be conducted by Valdosta State University (VSU) to determine the attitude of community members on the use and effectiveness of the TravelSafely App. Additional research will be conducted by the partnering Georgia Tech faculty, Professor Baabak Ashuri, where an appropriate design of experiments will be developed to empirically analyze changes in traffic patterns across the City of Valdosta. Real-time data collected from actual users of TravelSafely will be incorporated to examine changes in the behavior of traveling publics, bikers, and pedestrians. The results of these field studies will provide invaluable information for the City in its decision-making process for subsequent phases to make Valdosta an exemplary smart city in the Southeast (e.g., including other emergency vehicles and school buses in the connected vehicle system). Funding from the Georgia Smart Communities Challenge is critical for the success of establishing a strong partnership among communities in the city of Valdosta and Lowndes County, educational institutions (VSU and GT), and smart travel technology providers (Temple and Applied Information). This initiative will provide one-of-a-kind opportunities for students from VSU and GT to participate in real-world applied projects. Specifically, this project will contribute to further enhancement of the VSU's Regents' Engineering Pathway Program (REPP) and a newly created B.S. Degree in Engineering Technology program by creating courses in Smart Cities and Connected Communities, and Traffic Engineering and Management. This project will be a stepping stone for transforming the VSU campus into a fully equipped Smart Campus, which will include smart parking, autonomous vehicles, and other safety applications.

1.1 Vision

The City of Valdosta envisions a connected community with a smart traffic management system to transform the City into the only City in the State of Georgia, outside metro Atlanta, that all traffic lights are communicated with each other. This network will consist of an effective traffic management and control system, which offers increased road safety for all motorists and road-users in the City. Through this project, it is desired to have all of the 128 major traffic signals equipped with smart technology, enabling the possibility of connecting all modes of travel to traffic infrastructure and one another. This will include the installation of advanced transponders (and

associated hardware and software) in emergency response vehicles, and the downloading of smartphone apps, such as TravelSafely, which will be used by the students of VSU and members of the Valdosta community. Further information on emergency vehicle pre-emption, the additional pre-emption equipment required, and the TravelSafely application can be seen in Appendix D.

The City envisions creating and sustaining a smart, effective traffic control system which will result in improved traffic flow, road safety, and reduction in the number of traffic accidents and fatalities due to human error, specifically at VSU campus and surrounding areas. It is anticipated that this project, and collaboration with the City, GT and the industry, will make it possible for VSU to develop at least two Engineering courses related to smart cities and traffic engineering.

The Community's Current Conditions: The Valdosta and Lowndes County metropolitan areas are located at the southern region of Georgia, approximately 15 miles from the Florida-Georgia line at the interstate of I-75, and it is the major commercial, educational, and manufacturing center of southern Georgia. According to recent statistics the city of Valdosta and the Lowndes County have a population of about 116,000 with a median household income of $40,000. In addition to VSU, the main institution of higher education with the current enrollment of approximately 11,500 students, there are two other colleges (Wiregrass Georgia Technical College and Georgia Military College).

Many of the 128 traffic signal intersections in Valdosta are subjected to heavy traffic by various types of motorists (for instance, near Exit 18 of I-75) or pedestrians (most specifically around VSU campuses). VSU has two campuses in the city of Valdosta. The Main Campus is located approximately one mile away from downtown Valdosta (North Patterson Street) and the North Campus, which hosts the College of Business and the College of Nursing and Health Sciences, is located approximately a mile north of the main campus. The South Georgia Medical Center (SGMC), Valdosta Middle School (VMS), and a busy public park are all at or within a couple hundred feet from the same traffic intersection. Many VSU school buses/fire trucks/first responder vehicles transport students/patients/other community members around the two VSU campuses, where every day they make many turns in busy intersections around the two campuses. In addition, many large trucks from the forest product and paper manufacturing industries and other local industries pass from the nearby intersections daily. Considering that many VSU offices, (Admission, Registrar, Financial Aid, Human Resources, etc.) are located across Patterson Street, hundreds of students and other community members cross this street on a regular basis. This may be by walking, or using vulnerable mode of transportation, such as bicycles, scooters, or skateboards. Additionally, as a result of significant interest expressed from various members of the community in the Planetarium (located at the Physics and Engineering Department (Nevins Hall)), hundreds of visitors pass through the nearby intersection. More specifically, visitors include young children from elementary or middle schools.

Shown in Figs. 1 and 2 are locations of an intersection near VSU, and Admission building, direction of turn of the Library and Nevins Hall (designated by letter "A", "L", and "N"). A map of the VSU main campus and buildings near the Patterson Street intersections, and views of a highly desirable gated parking lot are shown in Appendix D (Figs. 1D-3D). Some drivers, as they drive towards the south on Patterson Street before arriving at the intersection (Fig. 1), look for empty spots in the gated parking and decide whether to make a right turn (to enter the parking lot if there is available space) or drive straight to find other parking spots (if none are available). This distraction may put pedestrians crossing the intersection, and other road users, in danger.

Fig. 1- A cross section near VSU showing the locations of Admission building (A), and turns to the library and Nevins Hall (L, N).

Fig. 2- Locations of turns for VSU buses and a popular gated parking (GP) in front of Nevins Hall.

Currently there is no connected or smart traffic system in the city or VSU campus that can take advantage of mobile technology, such as smartphones, to improve safety and mobility. Additionally, first responders are not yet equipped with the accompanying advance technology to create pre-emption calls at traffic intersections. This technology assists in providing green lights, reducing time behind traffic lights and ensuring faster response time in emergency situations. The City is continuously focusing on further improvement of its TMC by seeking new opportunities to collaborate with its local and other communities to further develop the existing system.

Motivating Factors: When crossing several intersections near VSU, many pedestrians (specifically young students) may be paying more attention to their smartphones or other distractions than to the movement of traffic and traffic signals. There are also many young, inexperienced motorists around the VSU campus that are subjected to numerous distractions. Furthermore, there is a large intersection at the SGMC, and other locations in Patterson Street, near the VSU campus where many students and senior citizens cross the street every day. Considering that SGMC, VSU campus, VMS, and Valdosta Fire Station are all located within close proximity, the response to accidents, fires, and other emergencies by the medical responders, fire trucks, and police vehicles should be with minimum possible delay. This can be achieved by providing pre-emption at the traffic lights for emergency vehicles. To improve connectivity, safety and efficiency of the traffic monitoring system, the City is proposing an upgrade to the currently deployed infrastructure to incorporate the latest smart technology available (e.g., using the Glance traffic signal monitoring software, TravelSafely connected vehicle application). It is expected that the adoption of this technology throughout the City will assist in improving the lives and road-safety of community members within the Valdosta area, and more specifically at the highlighted problem intersections.

In this project (Phase I of a more-ambitious smart and connected community plan), the City proposes to create "Smart" intersections and traffic monitoring/control systems. Applying this technology will establish V2X (vehicle-to-everything) communication, where the ecosystem of App users will include motorists, and vulnerable road users. This project will be a stepping stone to promote other smart city initiatives in Valdosta, for example, transforming the VSU campus into a Smart and connected campus – relative to its parking lots (creating smart gated parking lots), and developing infrastructures and smart applications for autonomous vehicles. It is expected that project benefits will include a reduction in traffic accidents, specifically around the VSU campus. This project will additionally provide a better name recognition for the City of Valdosta as a "Smart City" in the Southeast, which will contribute to the attraction of more industries to the region, while helping the city to better establish itself as an alternative to larger cities for retirements.

Another motivating factor of this project is tremendous educational opportunities that this project will provide for the newly created B.S. Degree in Engineering Technology program at VSU. There is no other B.S. degree in engineering program in the region. During the past few years, a few scholarship opportunities for women and underrepresented minorities in transportation engineering have been available, however, because of a lack of knowledge in this field, the VSU students have not had the chance to take advantage of these opportunities. This project will enhance the opportunities offered to women and underrepresented monitories in engineering to participate in applied projects at the City's TMC, and make it possible for VSU to develop undergraduate research and project-based courses related to traffic engineering and management.

Citizen Input: Citizen input has always been a significant part of decision making relative to topics, such as energy, water, environment, planning and zoning, traffic operations, and other city matters. Public hearing sessions are held at the City Hall on a regular basis to discuss the issues of public interest. City of Valdosta and Lowndes County have a track record of providing opportunities to each citizen to address their concerns about traffic and other issues within the City. This proposed project is a continuation and expansion of planned capabilities within the TMC and a critical element envisioned in 2017 related to traffic signals. The project has the support of the citizens in the Valdosta-Lowndes community. City Council meetings are held twice per month. Most recently, meetings have been live-streamed and available for remote viewing by the citizens on the City website and social media pages. In the past few weeks, in an effort to meet social distancing requirements associated with the COVID-19 pandemic, citizens have been kept informed and asked to express concerns regarding City issues via email addressed to the City Mayor and Council.

Downloading and using the TravelSafely App allows citizens to actively be involved in the connected vehicle space. The technology will be provided and readily available, but the community needs to "take it into their own hands to make a difference – a safer environment for all road users." This project will contribute to the mission of the City to better engage communities in smart government efforts, through enhanced use of emerging technologies.

Descriptions of Prior Efforts: In 2017, City of Valdosta and Kimley-Horn performed a Traffic Signal Timing Study to optimize forty-four signalized intersections. Other objectives of the study were to reduce fuel consumption, vehicle emissions, driver delay, and driver stops/starts. A final report on the study was prepared by Kimley-Horn in June 2017 (further details on this report can be seen in Appendix D). Based on the findings of this study, signal timing of a number of intersections were upgraded and retimed, while operational improvement was performed on other intersections. However, several areas were identified for further operations improvement.

City of Valdosta has already invested several million dollars in the development of the TMC to monitor and control all 128 of the City's intersections. To improve TMC reliability, it has built redundancy in connectivity, through its traditional fiber line network as well as fiber optics and clouds systems. The City has worked closely with local providers of advanced traffic hardware and software (Temple and Applied Information) to upgrade the system every year. Using advanced wireless systems, in connection with field monitoring units and the Glance software, the City has had the ability to remotely monitor and control the traffic signals at these intersections for several years. Shown in Fig. 3 is a screenshot of the Valdosta's current system of intersections in Glance. Shown in Fig. 4 is a view of the TMC at Valdosta. The City has made almost all its cross walks at major intersections around VSU and other areas to be handicap friendly by installing blind sensitive areas at the end of each cross walk. However, it requires additional funding to be able to

continue to make enhancements to the smart traffic system in the City and around the VSU campus. This update will take advantage of the current system, while adding mobile technology to enhance safety and mobility of multiple modes of transportation. Users' inputs are critically missing in the existing system. There is a need to develop an intelligent platform to capture and integrate community's inputs for better design and operations of smart traffic system. The key is the enhanced communication for better co-ordination.

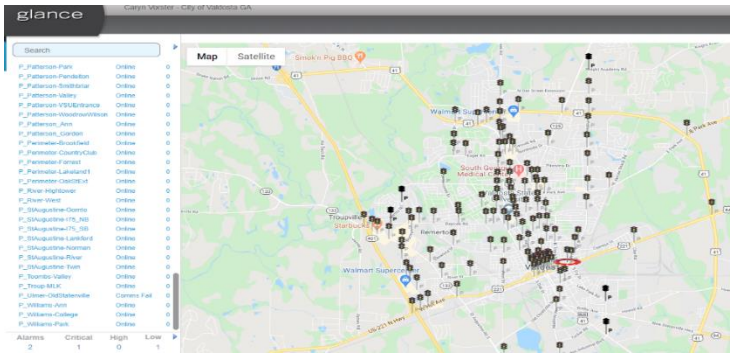


Fig. 3- A screenshot of the Glance software used in city of Valdosta's TMC showing the city's signalized intersections.

Fig. 4- A view the City of Valdosta Traffic Management Center (TMC).

Long-Term and/or End-Goals: To increase the capabilities of the system, the current electronic cards in the intersection field monitoring units need to be upgraded or replaced. This will allow the citizens of Valdosta and VSU students to take advantage of the connected vehicle mobile application. Additionally, it is required that transponders are installed in 10 Fire Department vehicles and other vehicles (e.g., first responder vehicles and school buses). The proposed one-year study will allow City of Valdosta, and communities in the Lowndes county areas, to develop connected system to improve the movement of all types of vehicles and pedestrians, specifically those vulnerable road users in a very safe and efficient manner. As part of the plan, it is proposed that various applications available on the TravelSafely App are incorporated into the system (examples of such applications are shown in Appendix D). Specific to the needs of the City, the App will be capable of notifying bicycle riders, pedestrians, and other drivers about motorists in the area and vice versa. Motorists will receive information on signal phasing and timing. Notifications will be communicated when the signal is about to turn green and alerts will be given of potential red-light running.

Through the capabilities of the App, all users will be fully aware of the traffic movements around them. This will meet the City's goal of creating a connected vehicle environment, where it is possible for all users, no matter where they live, to be able to use the smart App on their mobile devices. This application will assist citizens in being proactive, no matter what mode of transportation they use, to avoid accidents and injury; and will hopefully reduce the number of preventable traffic fatalities in Valdosta. All citizens will find an opportunity to be more informed about the background of traffic operations decision-making and contribute to the City's vision to become smarter and more inclusive. An educational goal of the study is to develop a B.S. Degree in Engineering Technology with a track in traffic engineering and management at Valdosta State University. During the funding period of the project the feasibility of creating such a track will be examined. The following is a list of long-term and/or end-goals of the project:

1) Making and sustaining the City of Valdosta as the most recognized Smart City outside Metro Atlanta, where it will be highly desirable for relocation of manufacturing industries as well as senior citizens for their retirement.

2) Developing a B.S. Degree in Engineering Technology with specialty in traffic engineering and management technology.
3) Making the campus of VSU a Smart Campus by creating a fully connected university for vehicles, creating smart parking areas, autonomous vehicles. The campus will become a testbed for educational and research activities.

The Envisioned Future State of the Community: By incorporating the TravelSafely application, and encouraging a large percentage of the community members to download the App on their smartphones through social media, civic organizations and public service announcements (and with part of the downloads being assigned to VSU engineering students as part of the project), it is envisioned that there will be a significant number of users resulting in a marked improvement in traffic safety throughout the City.

1.2 Framework

An advanced vehicle to everything (V2X) communication framework will be designed and implemented in this project. The main focus of this project is to further improve the capabilities of the City of Valdosta's Traffic Management Center (TMC) and to transform the City into one of the first Smart Cities in Georgia outside metro Atlanta. As previously stated, this will include having all 128 signalized intersections connected via the Glance TravelSafely App. By installing in-vehicle pre-emption equipment in the emergency and first responder vehicles, both fire and emergency medical response times will be reduced. The introduction of the smartphone app will establish greater awareness citywide; promoting safety for all users in the community no matter what mode of travel, be it automobile, motorcycle, bicycle, skateboard, scooter, walking or jogging. Downloading TravelSafely onto mobile devices allows the Glance system to establish vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication and data sharing that significantly enhances the safety and effectiveness of all travel movement within the City and thus greatly improves the well-being and quality of life of its citizens.

A critical element of the project will be to inform VSU students and other members of the community about the value of the TravelSafely App to promote high interest in downloading and using it on a daily basis. In collaboration with Georgia Tech and the City of Valdosta, studies will be conducted by the engineering students and faculty at VSU to determine feedback from users within the community, and specifically identify from VSU students, the factors that led and encouraged them to download the app onto their smart phones and if and how they were able to effectively use the app on their daily commute. Further analytics research will be conducted in collaboration with the Georgia Tech research team to quantify the impact of the enhanced traffic management system. Actual traffic data (before and after) and information captured from the TravelSafely App will be utilized to identify significant changes in traffic patterns. This research will inform the City and its different communities to evaluate the effectiveness of the emerging technology and make more-informed decisions about the future path that the City can take to become smarter and more inclusive following the successful completion of this project.

The funding from Georgia Smart Communities Challenge will make it possible to develop a highly sophisticated TMC, provide connected and smart life-saving technology for City of Valdosta citizens, and opportunities for students from the engineering transfer program (e.g., Regents' Engineering Pathway Program, REPP) and the newly created B.S. Degree in Engineering Technology program at VSU to gain valuable experience related to smart traffic management systems and transportation engineering. The grant will also provide opportunities to under-

represented students, including African American and female students, to participate in meaningful and applied transportation engineering related projects, supervised by the VSU engineering faculty, in collaboration with the engineers from the City of Valdosta and the Georgia Tech research team. Many of the students from the REPP program transfer to various engineering programs at Georgia Tech every year. The focus of the second year and subsequent years of the project is to transform the VSU campus into a smart campus (e.g., equipped with smart parking, autonomous vehicles, other safety Apps). The project will promote Valdosta's name recognition and brand as a smart and progressive city; help Valdosta attract more industries to southern Georgia; assist Valdosta in improving the quality of life of its citizens; and help Valdosta establish itself as a retirement community offering technology normally only found in larger, more congested, cities. Lastly, this project will be beneficial to users from all communities in and around Lowndes County that either work, live or travel through Valdosta.

1.3 Plan

The following tasks are planned to achieve the project objectives:

1) Identify required devices, hardware, and software for the project, and making sure that the identified items selected are completely compatible with the existing systems;
2) Implement hardware in all 128 intersections and enhance software in the operations center;
3) Install responders in 10 City's fire trucks;
4) Test and validate the hardware and software systems;
5) Set up community outreach and training workshops about the smart traffic system and the TravelSafely App using demonstration of actual use cases of V2V, V2I, and V2X features;
6) Develop an appropriate design of experiments to evaluate the effects of the new system on the City's traffic operations and the behavior of the traveling public in several modes;
7) Prepare a fact-finding survey to measure the citizen's attitude towards privacy, general interest, and encouragement methods on effective use of the App (IRB approval will be obtained);
8) Disseminate the survey from several channels to reach out to different sectors of the community, collect the survey responses, and conduct statistical analysis to analyze the results;
9) Conduct before and after study using the actual data retrieved from the City's operations control center to measure changes in traffic patterns of various community groups;
10) Engage VSU undergraduate students in research activities and internship opportunities to facilitate the City in the successful implementation of smart traffic technologies;
11) Develop educational and workforce development materials to prepare the next generation of engineering technology professionals at VSU with a focus on smart cities engineering; and
12) Prepare and submit progress and final reports and presentations (exemplary students' works will be presented in conferences and published in professional/academic journals).

The Temple and Applied Information Team will assist the City in the deployment and installation of the project. The following items provide further detail into the work plan and commissioning of the upgrades to be performed at the 128 intersections throughout the City.

Temple technicians will upgrade existing intersection devices while the City assists with installing the appropriate wiring harnesses (which enable pre-emption status monitoring), and program pre-emption into City's intersection controllers. Intersection inventory details will then be provided to Temple for configuration of pre-emption and TravelSafely applications. Drive testing will be performed to fine-tune configuration as needed. All intersections will undergo acceptance testing and commissioning to ensure that the smart traffic infrastructure operates as intended.

1.4 Research

The GT research team will work with the project team to develop an appropriate design of experiments to quantify the effects of advanced traffic management technology on travel behavior of different groups in the community. In addition to the undergraduate research projects about community attitude on TravelSafely, that will be performed by the VSU engineering students, another area of research that will be conducted by the Georgia graduate students is to quantify the benefit-to-risk ratio for including other City's first responders (in addition to fire trucks) such as ambulances, police cars, as well as the university and school buses in pre-emption to reduce their time behind traffic lights and have a faster response and transportation time for their vehicles. Although pre-emption for all these vehicles is expected to be advantageous, significant coordination needs to be made among all these vehicles with TMC to assure efficient operation. Since the Lowndes County High School is located in the City area, the county busses use the I-75 interstate to enter the high school and every day they stop additional times behind lights and sometimes are required to stop for a long period of time at the exits of I-75 (exits 16 and 18) that are at congested areas and it is not desirable for safety of the students. Research is needed to determine the next steps of pre-emption for other emergency vehicles and school buses. Dr. Ashuri, a Georgia Tech civil engineering professor who has a significant experience in data analytics and decision analysis will supervise his students to develop suitable mathematical models to determine the benefit-to-risk ratios for various scenarios associated with pre-emption.

2 Execution Plan

Close collaboration among several groups are critical to the success of the project. The leadership of City Engineer and the team working in the traffic Operations Center is instrumental in deploying the smart travel technologies in the City. A detailed scope of work and a statement from Temple about ongoing support to the City of Valdosta is given in Appendix C. Regular meetings (both physical and online) are important to facilitate project management. At the time that this proposal is being prepared, because of COVID-19 pandemic, many sections of governments, businesses, industries, and almost all parts of universities are operating online and as a results of reduction of human contacts, movement of traffic in the streets of Valdosta like in many other areas has reached to a minimum level. However, we are very hopeful that soon there will be a turning point in severity of the coronavirus pandemic everywhere and many people will be driving to their work places again in early Fall. VSU plans to restart its face-to-face classes in the Fall semester. There is no doubt that the adverse effects of the virus in many people relative to the economics, loss of jobs, and other personal and social challenges will still exist through the first stage of this project and possibly subsequent stages. As a result, there may be many more distracted drivers on the road as compared to the time before coronavirus. In view of the above, we need to plan accordingly and make sure to fully address the advantages of technology, automation, and connectivity in all types of travels.

Cost Plan

The existing hardware and software (Glance) used in the cabinets in all 128 signalized intersections have been purchased from Temple. Therefore, the City is not required to go through a new bidding process for upgrading the system. Temple, and AI will be the only companies that materials needed for the project will be purchased from. These companies have provided significant discounts to the City for this project. As shown in Table 1 and Appendix B, the total commitment of the City (cash plus In-kind) is significantly larger than the minimum specified by the grant application.

Table 1. Cost breakdown of the project for the City of Valdosta

Description of the Item to be Purchased and Service	**Cost ($)**
Electronic hardware & upgrade for 128 intersections ($756.58 per intersection)	$96,842.24
Transponders for 10 fire trucks ($2,914 per fire truck)	$29,140.00
TravelSafely App software installation, commissioning and mapping	$19,900.00
Subcontract to VSU for community outreach, research, & educational activities	$35,000.00
Total project cost	**$180,882.24**
Requested fund from the 2020 Georgia Smart Community Challenge	*$100,000.00*
Cash commitment of the City of Valdosta to contribute to this project	*$80,882.24*
In kind contribution by City (time spend by various City personnel)	*$25,000.00*
Total commitment of the City for this project (Cash + In-kind)	***$105,882.24***

Table 2. Budget and Justifications of VSU for the $35,000 sub-award from the City of Valdosta

Description of the Task Performed	**VSU**
Faculty course overload (A course overload per semester also during summer for co-PI including 31.9% Fringe Benefit). *Per month: $1,375.00*	$16,500.00
Salary for two student Assistants (one student/ semester, rate: $10/hr to work on data collection, analysis, & assistant in City TMC, etc.). *Per month: $800.00*	$9,600.00
Workshop, Field trip to Valdosta TMC, Georgia Tech, and AI Laboratory in Alpharetta GA. *Per month: $291.67*	$3,500.00
Travel to present at conferences, at least one conference presentation by each VSU engineering student & another presentation by Co-PI. *Per month: $375.00*	$4,500.00
Printing/copying, flyers, development of website, & on-line/distance learning lectures, posters, mails, & publication materials, misc. *Per month: $75.00*	$900.00
Total share of funding to transfer from the City to VSU as a sub-award	**$35,000.00**
Additional in-kind contribution of VSU (additional time spent by faculty, and staff in research, accounting, use of computer hardware, and other services)	**$5000.00**

Table 3. Budget and Justifications of Georgia Tech (Dr. Ashuri)

Description of the task performed	**GT**
Faculty time of Dr. Baabak Ashuri dedicated to this research, including 31.9% Fringe Benefit Rate. *Per month: $1,231.50*	$14,778.00
Stipend for one graduate research assistant (GRA), including GRA Health Insurance rate of 6.2%. *Per month: $2,518.50*	$30,222.00
A total of 5 Field trips and travels to Valdosta for progress meetings, workshop, data collection, AI Laboratory in Alpharetta GA (iATL), and other appropriate events and conferences. *Per month: $333.33*	$4,000.00
Materials and supplies, including IT infrastructure, printing/copying, flyers, development of website, & on-line/distance learning lectures, posters, mails, & publication materials, misc. *Per month: $83.33*	$1,000.00
Total Georgia Tech research project budget	**$50,000.00**

Personnel Plan

Project Manager/Lead-point-of-contact Contact Information: **Patrick Collins,** City Engineer and Director, B.S., Civil Engineering, University of Memphis, (229) 259-3530, pcollins@valdostacity.com, **Project time commitment: 5% to 10%.**

Patrick S. Collins, P.E., is the Director of Engineering/City Engineer at the City of Valdosta and has served in this position for over nine (9+) years. He has been employed in the engineering profession in both the private and public sector over the past thirty-four (34) years specializing in municipal and county government and state agency infrastructure, management, and operations. He has been licensed and practiced engineering in Florida, Tennessee, and Georgia. As the project leader, he will work closely with the Traffic Manager Larry Ogden and the Faculty Researcher (Co-PIs) Dr. Ashuri and Dr. Hojjatie on general aspects of the project.

Traffic Manager: **Larry Ogden, Project time commitment: 10% to 20%.**

Larry Ogden has a B.S. Degree in Sociology/Anthropology with a minor in Psychology from VSU. He has worked for the City of Valdosta for twenty-three (23) years and during the past six (6) years he has been the City's Traffic Manager. His duties include supervising personnel, organizing daily activities, writing work orders and monthly reports, controlling inventory, and coordinating with state and county governments to ensure public safety and satisfaction. He will work closely with manufacturers of the hardware and software proposed in the project to ensure successful operation of all tasks related to the Smart City project. He will also work with the project managers and the Co-PIs on all aspects of the project.

Co-Principal Investigators: **Dr. Baabak Ashuri**, **Project time commitment: 10%,** Professor in Schools of Civil & Environmental Engineering, and Building Construction, and Brook Byers Institute for Sustainable Systems (BBISS) Fellow at Georgia Tech. Baabak has a Ph.D. in Industrial and Systems Engineering. His work has focused on quantitative methods for construction engineering and management specifically related to construction analytics, innovative project delivery, and valuation of green-energy investments. has supervised many student projects funded by the department of transportation (DOT). Baabak and his graduate students will actively participate in all engineering and research aspects of the project, including data collection, methods for statistical analysis of data and development of models related to studies on decision analysis of including other emergency vehicles and school buses in the connected vehicle system in the City of Valdosta. He will actively participate in all workshops held for public and students at VSU and preparation of all project reports.

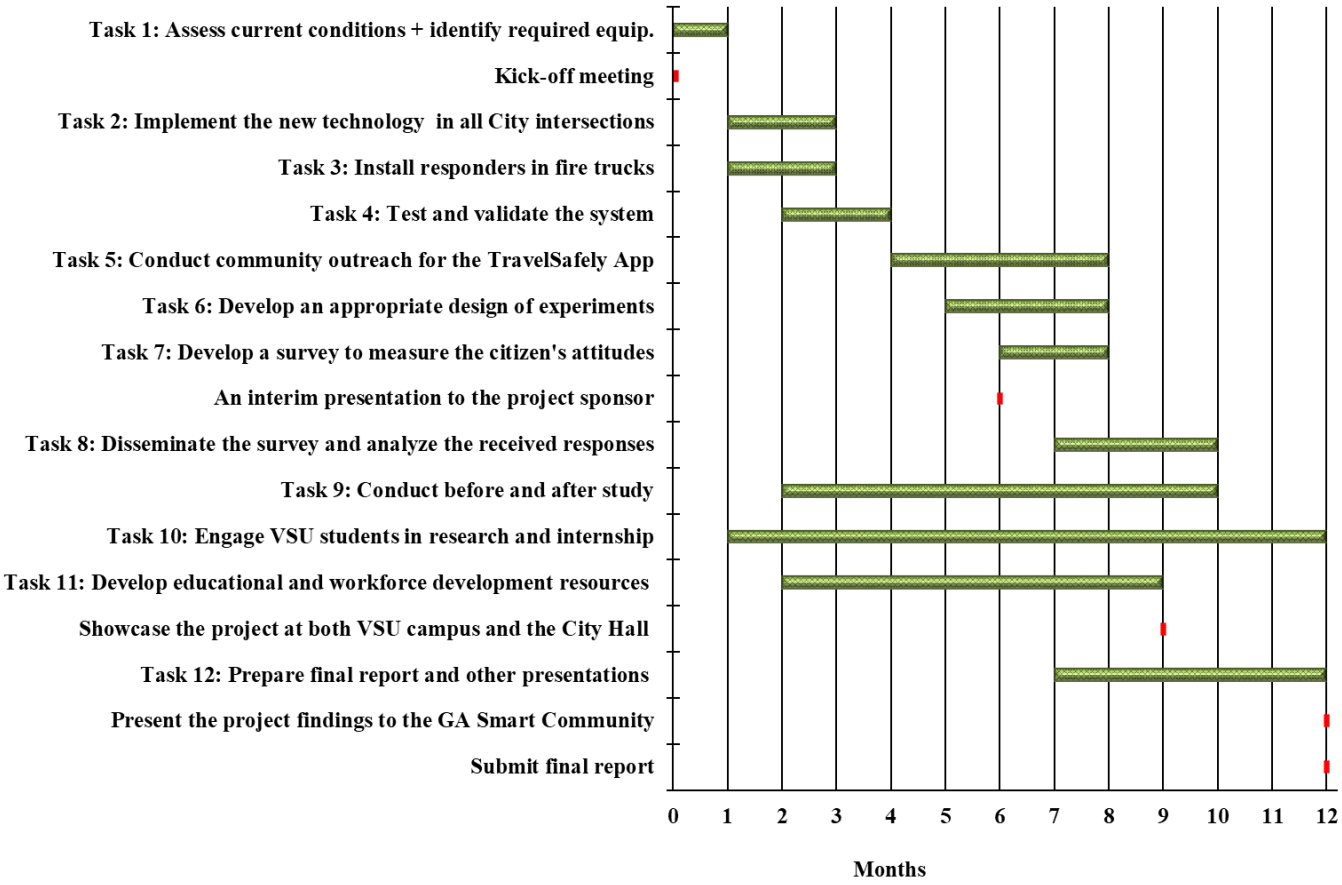
Dr. Barry Hojjatie, P.E., Professor & Engineering Coordinator, Valdosta State University, Ph.D., Mechanical Engineering, University of Florida, **Project time commitment: 10%.** Barry's specialty is in experimental and computational mechanics, modeling and analysis of dynamics systems, CAD, and renewable energy. He has a long and successful track record in research and student related services with GT. Barry has worked as a research engineer at IPST/GT for 10 years, directed the REPP at VSU for 17 years, and transferred more than 400 engineering students to GT. Barry who has played a key role in preparation of the proposal will continue to collaborate with the City, Georgia Tech, Temple, and AI on various aspects of the project. Also, he will supervise the undergraduate research projects conducted by the VSU engineering students. In collaboration with GT and the City of Valdosta, he will also develop traffic engineering and management related courses at VSU.

Industry Collaborators: Mr. Adrian Baker Technical personnel from Temple Inc., and **Ms. Caryn Vorster** from Applied Information and other personnel from the Infrastructure Automotive Technology Laboratory (iATL) will be involved on the installation of hardware and software, workshop, preparation of training materials, and technical writing related to the project.

The project manager, Valdosta, Valdosta traffic manager, the project Co-PI's, and the technical representatives from Temple and AI, have been meeting remotely through a secure ZOOM site every week during the past two months to discuss matters related to preparation of this proposal. We will continue to have conference calls at least once every two weeks throughout the next twelve months to discuss about the progress and milestones associated with the project. The Co-PIs will meet on a weekly basis on matters related to students' research. All the engineering and practical aspects of the project is managed directly by the project manager. The research and educational parts of the project are managed by the Co-PIs. The experience of working remotely during the COVID-19 Pandemic period has shown that we can effectively work on the project through secure video conferencing and either the project manager or the Co-PIs will initiate and schedule video conference anytime is needed.

Schedule

Table 4. Project Schedule and Milestones



Collaboration

This project involves close collaboration between the City of Valdosta, VSU, and Georgia Tech (see Fig. 5 for the organizational chart of the project). The project manager (Patrick Collins) works closely with the Traffic Manager Larry Ogden on a daily basis. There is a history of collaboration between the VSU engineering faculty with the Valdosta City Engineer as well as the faculty members of Georgia Tech involved on this project. Dr. Ashuri and Dr. Hojjatie will collaborate in supervision of student research and they will collaborate with the City of Valdosta in preparation of progress reports (e.g., mid-year and final reports). VSU engineering students will prepare suitable survey questions related to the attitude of the citizens relative to privacy, general interest, methods of encouragement on effective use of TravelSafely App. They will also prepare survey questions related to before and after the use of the App to quantify number of accidents and near miss or dangerous cases such as drivers speeding near the campus of school zones, drivers failing to yield to pedestrians in crosswalks near VSU campus or other areas near VSU, drivers not giving adequate space to other cars or bicyclists, and pedestrians crossing against traffic signals, etc. and they will perform statistical analysis to determine the effectiveness of the TravelSafely App in reduction of these undesirable situations. With the technical support from the Applied Information Inc. iATL lab in Alpharetta, we are committed to taking advantage of this project opportunity to develop courses related to Traffic Engineering and Management for students in the B.S. degree program in Engineering Technology. We will continue to have meetings through video conference calls at least once every two weeks throughout the next twelve months to discuss progress and milestones associated with the project. The Co-PIs will meet on a weekly basis on matters related to students' research. Phase II of the project will start in the Fall of 2021 and involve collaboration with other emergency response personnel in Valdosta (e.g., ambulance and police), and the City and Lowndes County school systems and is based on analysis of research data and results obtained from the decision analysis models developed by the Georgia Tech faculty (Dr. Ashuri) and his graduate students.

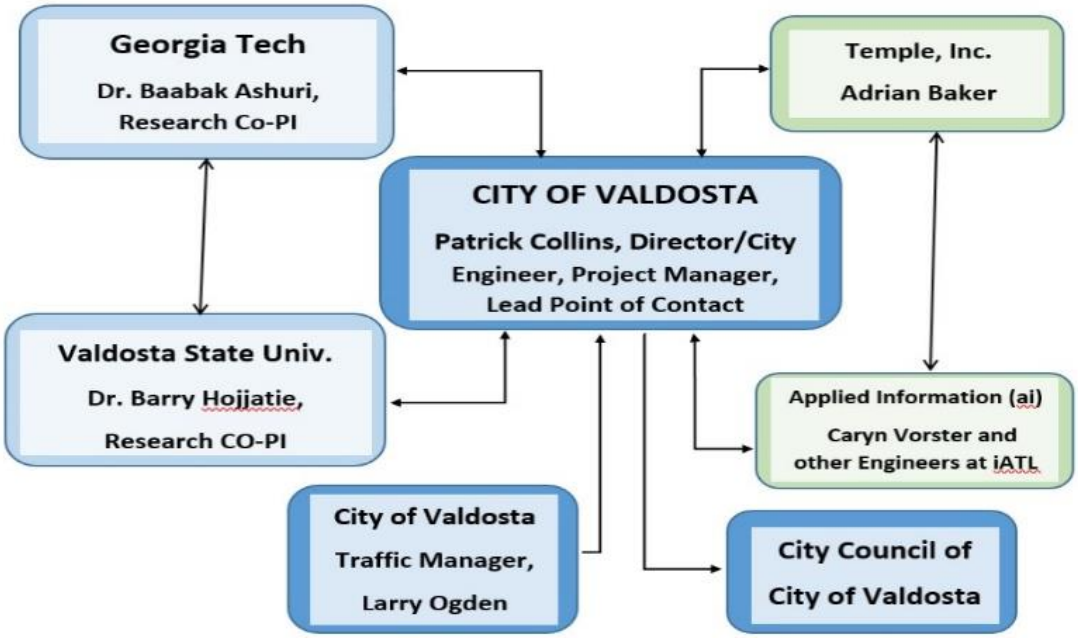


Fig. 5 Organziational Chart of the Project

Appendix A: Letters of Support

CITY OF VALDOSTA, GEORGIA

L. MARK BARBER
CITY MANAGER

June 11, 2020

Dear Selection Committee of the 2020 Georgia Smart Community Challenge:

On behalf of the City of Valdosta, please accept this submittal for the 2020 Georgia Smart Community Challenge Grant. The City is excited about the opportunity to apply for this Grant. We believe we have assembled a great project in collaboration with Applied Information (AI), the Georgia Institute of Technology (Georgia Tech), Temple, and Valdosta State University (VSU). The Grant proceeds will be used to expand the capabilities of our traffic control cabinets citywide to deploy signal preemption and the Travel Safely® app, and the City is also committed to subcontracting with Georgia Tech and VSU for community outreach, transportation research, and the development of a transportation-related engineering program at VSU. The total project cost of purchases and services is valued at $180,882.24.

Our City Engineer, Patrick S. Collins, P.E., will be the key contact and Project Manager. Mr. Larry Ogden, our Traffic Manager, will also be committed to the Project. Mr. Ogden will oversee any necessary technical support required to successfully install the cabinet upgrades and work with students assigned to the Project. Together, we anticipate that Staff time, including the time of our Traffic Technicians assigned to the Project, will amount to over of $25,000 of in-kind services support. The total proposed commitment of the City towards this Project (cash and in-kind) is valued at $105,882.24.

In 2018, the City of Valdosta invested $402,129.92 in the initial phase of this Project by installing Glance software and upgrading hardware in our traffic cabinets. An award of $100,000.00 in Grant proceeds from the 2020 Georgia Smart Community Challenge, coupled with the City's additional cash commitment of $80,882.24, will allow the City to utilize the Glance software and upgraded traffic signal cabinets with the Travel Safely® app to their fullest capability. In addition, the Project will promote safety, research, and create new educational opportunities for students in the South Georgia region.

Should you have any questions upon reading the Grant Application, please contact Mr. Collins at (229)259-3530. He will be happy to assist you with your inquiry. Again, we thank you for this opportunity and respectfully request that you give careful consideration to our submittal. We eagerly await your decision.

Sincerely,

L. Mark Barber
City Manager

tsb

Post Office Box 1125 • 216 East Central Avenue • Valdosta, GA 31603-1125
Telephone (229) 259-3518 • mbarber@valdostacity.com
An Equal Opportunity Employer

VALDOSTA
A City Without Limits

VALDOSTA STATE UNIVERSITY

June 4, 2020

Georgia Smart Community Challenge Grant

Dear Selection Committee Members,

I am writing on behalf of Valdosta State University to express our strong support for the application of a team of engineering faculty and engineers from VSU, Georgia Tech, and the City of Valdosta to receive a Georgia Smart Community Challenge grant. This grant is intended to improve the capability of the signalized intersections of the City to be connected to a smart system, and to further develop the engineering-related programs at VSU.

During the past thirty years, hundreds of students from the VSU Regents' Engineering Pathway Program (REPP) have transferred to and successfully completed their B.S. degree in engineering from Georgia Tech, and some of them have entered graduate school at Tech, as well. In addition to the REPP, we are launching a new B.S. degree program in Engineering Technology at VSU this coming Fall semester. Dr. Hojjatie is a Professor and program Coordinator of the VSU engineering programs who is a Co-PI of the Georgia Smart project that is being submitted by the City of Valdosta. He is a former research engineer from IPST/Georgia Tech and has a long history of successful collaborations in research and student services with Georgia Tech. To mention an example, Dr. Hojjatie, and one of his former VSU students collaborated with a Georgia Tech colleague to publish a book chapter related to materials science and mechanical engineering, which has received significant attention in the engineering community in recent years. Certainly this project will be beneficial to the students and faculty at VSU and Georgia Tech alike.

VSU is strongly committed to support the Smart City project, and in response to the $35,000 that we are slated to receive from this grant (as a sub-award from the city of Valdosta), VSU will provide $5,000 of in-kind support, in the form of various services needed for the success of this project. The objectives of the Georgia Smart Community Challenge are of significance to Valdosta and communities all over Georgia. I hope that the selection committee will award the proposal to the City of Valdosta. We are eager to partner with them on this project.

Sincerely Yours,

Robert T. Smith, Ph.D.
Provost and Vice President for Academic Affairs
Professor of Mathematics

OFFICE *of* ACADEMIC AFFAIRS
PHONE 229.333.5950 • **FAX** 229.333.7400 • **WEB** www.valdosta.edu/academic
ADDRESS 1500 N. Patterson St • Valdosta, GA 31698–0160

Southern Georgia
Regional Commission

June 4, 2020

GA Smart Communities Challenge 2020

To Whom It May Concern:

As the designated Metropolitan Planning Organization (MPO) for the Valdosta Urbanized Area, the Southern Georgia Regional Commission (SGRC) fully supports the City of Valdosta's application for the GA Smart Communities Challenge 2020 to improve traffic monitoring, communication, connectivity, safety, and efficiency of the city's traffic signal system.

In 2014, the MPO adopted the Greater Lowndes County Common Community Vision that includes 18 goals that various community organizations are working to achieve. These goals include the development of education programs for high-wage and high-skill jobs, support of vital regional economic drivers like Valdosta State University (VSU), and support for safe, affordable, multi-modal transportation infrastructure investment. This pilot project will help the City work to achieve these goals by developing a degree in Engineering Technology at VSU and implementing technology solutions to make the transportation systems safer and more efficient.

The forthcoming Vision2045 Transportation Plan for the MPO area (will be released for public comment in late June 2020) includes action strategies for local governments to assess current local government policies to lay the groundwork for future connected vehicle technologies. This pilot project will put Valdosta near the forefront in preparing for the future of connected vehicles.

The Georgia Department of Transportation Pedestrian Safety Action Plan 2018-2022 highlights Valdosta as a Focus City for pedestrian crashes (13th most pedestrian crashes). The Plan outlines several activities to improve pedestrian safety in Focus Cities including soliciting public and private funding for safety improvements. The Plan also identifies data gaps for driver and pedestrian distraction. The research conducted by this pilot project could help fill these gaps in Valdosta and demonstrate how technology solutions can improve pedestrian safety.

On behalf of the MPO Policy Committee, I write to support this project for the City of Valdosta to be a leader in implementing Smart City solutions to improve traffic efficiency and safety throughout the community. Should you have any questions for me, please contact Corey Hull or me at 229-333-5277.

Sincerely,

Lisa Cribb
Executive Director

An Equal Opportunity Employer / Program

327 W. Savannah Ave., Valdosta, GA 31601
1725 S. Ga. Parkway, W., Waycross, GA 31503

Phone (229) 333-5277 • Fax (229)-333-5312
Phone (912) 285-6097 • Fax (912) 285-6126

www.sgrc.us

Valdosta-Lowndes
DEVELOPMENT AUTHORITY

BuildLowndes.com

June 2, 2020

Dear Selection Committee members of the Georgia Smart Community Challenge Grant:

The purpose of this letter is to express the support of the Valdosta-Lowndes County Development Authority of the Application of the city of Valdosta, Valdosta State University, and Georgia Tech to receive the Georgia Smart Communities Grant. Our office has a history of collaboration with the engineering program at VSU. When we try to encourage large production industries to move to the region, one of the main questions that is raised occasionally by the potential industries that consider establishing a new manufacturing facility in our area, is the availability of highly skills technical workers in the region. Recently we have been able to attract a large glass container manufacturing company in our region and VSU and its engineering program have played an important role on our success. I strongly believe that further development of the engineering programs at VSU will make Valdosta and Lowndes county a more attractive place for other manufacturing companies to move to the region.

Receiving the Georgia Smart Communities award will make it possible for the city of Valdosta to be recognized as a Smart City in Southern Georgia. This will help to attract more industries to the region. It will also help the engineering students at VSU to have the opportunities to collaborate with the Traffic Management Center of the city and Georgia Tech and will make it possible for VSU to further develop it engineering program. I enthusiastically support this grant proposal and hope that the decision of the Selection Committee about the proposal is positive.

Sincerely,

Stan Crance, Director of Business Recruitment

103 Roosevelt Drive // Valdosta, GA 31602 // 229.259.9972

Raytheon Intelligence & Space

David B. Brown, Ph.D.
Sr. Mechanical Engineer

O: 310.607.0502
david.b.brown@rtx.com

Raytheon Intelligence & Space
Space EO Sensor Systems
2000 East El Segundo Blvd
P.O. Box 922
M/S EO/E01/D126
El Segundo, CA 90245
USA

03 June 2020

Dear Selection Committee of the 2020 Georgia Smart Community Challenge,

It is my pleasure to write to strongly recommend the application of the team of engineers and researchers from Valdosta State University (VSU), the city of Valdosta, and the Georgia Institute of Technology (Georgia Tech) for the 2020 Georgia Smart Community Challenge grant.

I am a former student of Dr. Barry Hojjatie at VSU in the Regents' Engineering Pathway Program (REPP). I entered VSU as an REPP student in 2006, then transferred to Georgia Tech in 2010. After completing my B.S. degree in mechanical engineering in 2012, I entered the Ph.D. program at Georgia Tech. With a letter of support from Dr. Hojjatie, I received the National Science Foundation Graduate Research Fellowship during my first year of the program, and I would go on to receive additional fellowships and awards. My research areas of interest were heat transfer, materials science, and thermal metrology. Following completion of my Ph.D. in 2019, I joined Raytheon Intelligence and Space (formerly Raytheon Space and Airborne Systems) in El Segundo, CA as a Senior Mechanical Engineer where I use my background in the thermal sciences to perform design and analysis of spacecraft hardware.

I have read a summary of the grant that plans to transform the city of Valdosta into one of Georgia's first Smart Cities outside of the metro Atlanta area, connecting all of its traffic intersections to a smart traffic system (Phase I) and transforming the VSU campus into a fully equipped Smart Campus (Phase II). I am extremely impressed with the ideas in this proposal and I recommend it is selected for funding. I understand that Dr. Hojjatie's role on this grant is to provide opportunities for students from the REPP program at VSU, specifically underrepresented minorities, to participate in undergraduate research related to traffic engineering and management.

I received strong support from Dr. Hojjatie throughout my education at VSU as well as during my B.S. degree at Georgia Tech. Dr. Hojjatie and VSU have played a major role in building my foundation in engineering. Most of my friends and family did not have the opportunity to attend colleges like VSU and Georgia Tech, and the percentage of students from underrepresented minorities was consistently very small. I often found myself as the only African American student in my classes and study groups. The numbers decreased significantly the further I continued in my studies. Completing an engineering curriculum was exceedingly difficult under these circumstances, and I am greatly appreciative to professors like Dr. Hojjatie that supported me during my studies. Based on my experience, I am certain that Dr. Hojjatie will utilize the funding in this grant to provide more opportunities and support for underrepresented students.

I recommend the committee makes a positive decision regarding this grant, and I am confident it will improve the lives of the citizens of Valdosta as well as facilitate the development of the engineering programs at VSU.

Please don't hesitate to contact me for further information.

Sincerely,

David B. Brown, Ph.D. (Georgia Tech, 2019)

Briggs Benson
June 2, 2020

Dear members of the Selection Committee of the Georgia Smart Community Challenge Grant:

As a former student from VSU and a recent graduate of Georgia Tech (Mechanical Engineering, Class of 2020), it is a great privilege for me to support this collaborative project application with hopes that VSU may be granted the opportunity to collaborate with Georgia Tech to apply the Georgia Smart Grant with intentions to make the city of Valdosta a Smart City and to further develop the Engineering Technology program at VSU. I recently graduated with Highest Honors from Georgia Tech with a B.S. degree in Mechanical Engineering and a Minor in Material Science Engineering. Thanks to the BSMS program, I am also about 1/3 of the way through with my MSME degree at Georgia Tech where I am focusing on structural analysis. In June, I am set to start my first job at Lockheed Martin in Marietta as an Aeronautical Engineer in the Structural Integrity department while I finish up my Masters.

Being born and raised in South Georgia, I have a strong connection and passion for the communities that make South Georgia so special, including the city of Valdosta. My time as a student at Valdosta State was an important step in my engineering career and I can't help but attribute some of my success at Georgia Tech to the preparation received in my time at VSU. After taking some classes at VSU related to CAD and mechanics and utilizing an internship experience with SAFT America which Dr. Hojjatie helped me obtain, I became passionate about structural analysis and materials science. In my opinion, the Valdosta State community is one of the most important assets for progress in the City of Valdosta and the Southern part of Georgia and receiving this grant will help not only VSU but also many other communities in the region.

I request that the respected members of the Selection Committee of the Georgia Smart Community Challenge Grant approve this proposal so that not only can the VSU community benefit from the grant but so that the communities all over south Georgia can also benefit and push forward on their path toward continuous innovation.

Sincerely,

Briggs Benson
Former VSU Student, GT BSME '20/ MSME '21
Briggsbenson21@gmail.com

Appendix B: Local Match Documentation

CITY of VALDOSTA, GEORGIA

Teresa S. Bolden
City Clerk

CERTIFICATION

Georgia, Lowndes County

I, Teresa S. Bolden, Clerk of Council of the City of Valdosta, Georgia, a municipal corporation of the State of Georgia, do hereby certify, as custodian of the official records of the Valdosta City Council, that the Mayor and Council approved (7-0 vote) at the June 11, 2020 City Council Meeting the request to authorize the City of Valdosta Engineering Department to apply for a Georgia Smart Community Challenge Grant and purchase equipment for upgrades to the Traffic Management Center.

Witness my official signature and the seal of the City of Valdosta, this 11th day of June, 2020.

Teresa S. Bolden

Teresa S. Bolden, Clerk of Council
Valdosta, Georgia

City of Valdosta . P. O. Box 1125 . 216 East Central Avenue . Valdosta, GA 31603 . Phone: (229) 293-3500 . Fax: (229) 259-5411
An Equal Opportunity Employer

CITY OF VALDOSTA, GEORGIA

L. MARK BARBER
CITY MANAGER

June 11, 2020

Dear Selection Committee of the 2020 Georgia Smart Community Challenge:

On behalf of the City of Valdosta, please accept this submittal for the 2020 Georgia Smart Community Challenge Grant. The City is excited about the opportunity to apply for this Grant. We believe we have assembled a great project in collaboration with Applied Information (AI), the Georgia Institute of Technology (Georgia Tech), Temple, and Valdosta State University (VSU). The Grant proceeds will be used to expand the capabilities of our traffic control cabinets citywide to deploy signal preemption and the Travel Safely® app, and the City is also committed to subcontracting with Georgia Tech and VSU for community outreach, transportation research, and the development of a transportation-related engineering program at VSU. The total project cost of purchases and services is valued at $180,882.24.

Our City Engineer, Patrick S. Collins, P.E., will be the key contact and Project Manager. Mr. Larry Ogden, our Traffic Manager, will also be committed to the Project. Mr. Ogden will oversee any necessary technical support required to successfully install the cabinet upgrades and work with students assigned to the Project. Together, we anticipate that Staff time, including the time of our Traffic Technicians assigned to the Project, will amount to over of $25,000 of in-kind services support. The total proposed commitment of the City towards this Project (cash and in-kind) is valued at $105,882.24.

In 2018, the City of Valdosta invested $402,129.92 in the initial phase of this Project by installing Glance software and upgrading hardware in our traffic cabinets. An award of $100,000.00 in Grant proceeds from the 2020 Georgia Smart Community Challenge, coupled with the City's additional cash commitment of $80,882.24, will allow the City to utilize the Glance software and upgraded traffic signal cabinets with the Travel Safely® app to their fullest capability. In addition, the Project will promote safety, research, and create new educational opportunities for students in the South Georgia region.

Should you have any questions upon reading the Grant Application, please contact Mr. Collins at (229)259-3530. He will be happy to assist you with your inquiry. Again, we thank you for this opportunity and respectfully request that you give careful consideration to our submittal. We eagerly await your decision.

Sincerely,

L. Mark Barber
City Manager

tsb

Post Office Box 1125 • 216 East Central Avenue • Valdosta, GA 31603-1125
Telephone (229) 259-3518 • mbarber@valdostacity.com
An Equal Opportunity Employer

VALDOSTA
A City Without Limits

VALDOSTA STATE UNIVERSITY

June 5, 2020

Mr. Patrick Collins
Director/City Engineer
City of Valdosta, Engineering Dept.
Valdosta City Hall Annex
300 N. Lee Street
Valdosta, GA 31601

Dear Mr. Collins,

I am writing on behalf of Valdosta State University to express our strong support for the participation of Dr. Barry Hojjatie and his engineering students in the activities related to the Georgia Smart Community Challenge Grant. Based on a verbal agreement made among the project team, it is anticipated that if the requested grant of $100,000 is awarded by Georgia Tech to the City of Valdosta, a total amount of $35,000 of it will be in turn be awarded to VSU, allowing Dr. Hojjatie and his students to perform the undergraduate research activities outlined in the proposal. We are hopeful that the experience obtained from this grant will also lead the new VSU engineering technology program to develop one or more courses related to transportation engineering technology.

VSU will contribute a total of $5,000 of in kind support needed for the success of this project. The objectives of the Georgia Smart Community Challenge are of significance to Valdosta and communities all over Georgia. I hope that the selection committee will award the proposal to the City of Valdosta. We are eager to partner with you on this project.

Sincerely Yours,

Robert T. Smith, Ph.D.
Provost and Vice President for Academic Affairs
Professor of Mathematics

OFFICE *of* ACADEMIC AFFAIRS
PHONE 229.333.5950 • **FAX** 229.333.7400 • **WEB** www.valdosta.edu/academic
ADDRESS 1500 N. Patterson St. • Valdosta, GA 31698-0160

Appendix C: Letters of Understanding from NGOs

Temple, Inc.
PO Box 2066
Decatur, AL 35602

Temple

TO: Georgia Smart Communities Challenge 2020 Board
RE: Temple, Inc. Letter of Commitment

To whom it may concern:

We take pleasure in submitting the following letter of commitment to support the City of Valdosta's Grant Proposal submission to the Georgia Smart Communities Challenge 2020 Grant. The Temple, Inc. and Applied Information, Inc. Team is at the forefront of delivering the next generation of advanced connected traffic systems into the transportation industry.

Since 1954, the people of Temple, Inc. have been focused on integrity, outstanding service, and relationships that endure. We remain committed to providing the most comprehensive traffic and ITS solutions available, matched with unrivaled service and support across the entire Southeastern United States. Technical expertise has always been a goal for Temple, Inc. in all the products the company brings to market, employing 3 full-time traffic service technicians in the State of Georgia.

In this proposal, Applied Information is the technology provider, and subcontractor to Temple, Inc. Temple will be the main contractor and supplier of services to the City of Valdosta that will provide a scalable, autonomous and connected vehicle platform that will provide real, discernable benefits to Valdosta citizens immediately.

The Temple/Applied Information Team is responding to this grant proposal with real, tangible and implementable goals/tasks to ensure Connected Vehicle, CV2-X, TravelSafely®, and Emergency Vehicle Preemption technologies to optimize traffic and engage Valdosta resident/students in a way that has not yet been realized outside the Metro Atlanta Region. The grant proposal tasks also highlight the Applied Information equipment already in place in 128 Valdosta traffic control cabinets; the grant award would allow Valdosta the ability to fully build out the Connected Vehicle/Smart City system they began in 2018. We are committed to their success in this endeavor and grant proposal, and appreciate the privilege to partner with Valdosta State University, Georgia Tech, and the City of Valdosta.

Kind Regards,

Forrest Temple

Forrest Temple,
President, Temple, Inc.
256.221.7016
www.forrest.temple@temple-inc.com

Temple

SCOPE of WORK, City of Valdosta AI Upgrade

Deployment and Installation Work Plan / Approach:
Below are the tasks involved in the Scope of Work for this Upgrade Project:

1. **Temple, Inc.** technicians to wire existing Applied Information intersection devices and configure for Emergency Vehicle Pre-emption.
2. **City of Valdosta** to program pre-emption into the City's intersection controllers.
3. **City of Valdosta** Traffic Engineering to install the Green Sense wiring harnesses that enable preemption status monitoring functionality.
4. **City** to provide intersection inventory details to Temple for configuration prior to drive testing.
5. **Temple, Inc.** to perform drive testing at all (128) intersections armed with this technology to ensure that all approaches to the intersection operate as designed.
6. **Temple, Inc.** to create MAP and Graphics for TravelSafely application.
7. **Temple, Inc.** to perform drive testing for TravelSafely to ensure the Application MAPs are fine-tuned and accurate, as intended.

Upon project award, Temple, Inc. will organize, along with the City, a virtual project kickoff meeting to determine an acceptable schedule for deployment.

- *Need from City*: Temple needs to know, at this point, which Preempts the City utilizes for each intersection. This will allow Temple to focus on a seamless deployment of the upgrade.
- *Services Timeline*: Once the deployment plan is accepted by the City, Temple can begin services at an estimated pace of approximately (45) intersections per week. These services include wiring preempts and drive testing Preemption and TravelSafely.
- *Drive-Testing Timeline*: Once the existing 2070 controllers are properly programmed for preemption and the Green Sense harnessing is installed, the Temple team can deploy their services.

  ***** *Additional daily rate charges apply if the City uses Temple personnel for their Scope tasks, or if, upon arriving onsite, the City hasn't performed their agreed upon Scope tasks (such as programming 2070s for preemption or installed Green Sense harnesses properly). These rates are* ***$1,500 per day****.*

Acceptance Testing / Commissioning
Post-Testing of the Intersection Preempt Devices (AI 500-086) the Team will go through the Acceptance Test Plan along with the City. The Validation Test will certify to the City that each intersection is properly installed, commissioned, and works as proposed. ATP Testing Timeline will be concurrent with Test Progress (Documentation Ongoing).

Temple Ongoing Valdosta Support
Temple, Inc. and Applied Information will assist the City of Valdosta in ensuring that project goals come to fruition, where ongoing remote support will be provided well after the deliverables are completed.

Applied Information Inc.
4411 Suwanee Dam Road,
Suite 510
Suwanee, GA 30024

TO: Georgia Smart Communities Challenge Board
RE: Applied Information Inc. Letter of Commitment

To Whom It May Concern:

We are pleased to submit the following letter of commitment in support of the City of Valdosta and Valdosta State University's grant proposal for the 2020 Georgia Smart Communities Challenge. Applied Information Inc., in partnership with Temple, Inc. will be involved with the delivering of smart city traffic solutions, assisting the City of Valdosta in transforming into one of Georgia's first Smart Cities outside the metro Atlanta area.

Applied Information Inc. is an industry-leading developer of connected, intelligent transportation systems (ITS) solutions designed to improve safety, reliability, and mobility. Formed in 2011 and based in Atlanta, GA, Applied Information has focused on solving a number of complex problems that challenge the industry, and have created unique, easy-to-use, and reliable connected vehicle solutions. To-date, more than 17,000 ITS devices have been deployed in over 580 cities in the USA. Previous Applied Information projects include "Marietta Smart City", America's first connected, Smart City, and Renew Atlanta's North Avenue corridor, GA's most densely connected corridor (North Avenue, ATL).

For this project, Applied Information will be the technology provider of the smart city solutions, where Temple, Inc. will be the main contractor and supplier of services to the City of Valdosta. Products and services will provide a scalable connected vehicle scheme that will provide real, discernable benefits to Valdosta citizens on Day 1.

The Applied Information/Temple Team is responding to this grant proposal with real, tangible and implementable goals/tasks to ensure Connected Vehicle, CV2-X, TravelSafely®, and Emergency Vehicle Preemption technologies to optimize traffic and engage Valdosta resident/students in a way that has not yet been realized outside the Metro Atlanta Region. The grant proposal tasks also highlight the Applied Information equipment already in place in 128 Valdosta traffic control cabinets; the grant award would allow Valdosta the ability to fully build out the Connected Vehicle/Smart City system they began in 2018. We are committed to their success in this endeavor and grant proposal, and appreciate the privilege to partner with Valdosta State University, Georgia Tech, and the City of Valdosta.

Kind Regards,

Peter Ashley,
VP Business Development, Applied Information Inc.
678.276.6952
pashley@appinfoinc.com

Appendix D: References and Citations

Navigating Appendix D:

Video Links – Additional Information:

Information about Lowndes and Lowndes County Development Authority:

1. https://www.lowndescounty.com/
2. http://www.buildlowndes.com/

Information about Valdosta State University Engineering Programs:

3. https://www.valdostacity.com/engineering
4. https://www.valdosta.edu/programs/bs-engineering-technology/
5. https://www.valdosta.edu/es/

Information about the TravelSafely App:

6. https://travelsafelyapp.com/
7. https://appinfoinc.com/
8. https://theiatl.com/

YouTube links detailing the features of the TravelSafely App:

9. https://www.youtube.com/watch?v=AD1clQFQ6j4
10. https://www.youtube.com/channel/UCVzmSEEuke0-xomVq1mzGHA
11. https://www.youtube.com/watch?v=hV-0ax-mgg8

YouTube link about the infrastructure Automotive Technology Laboratory (iATL):

12. https://www.youtube.com/watch?v=H_U6HJz5Lqw

YouTube link about Glance Connected Vehicle Preemption & Priority System:

13. https://www.youtube.com/watch?v=Ht1_lov69ew

Map of VSU Campus along North Patterson Street:

The following figure (Fig. 1D) is a map of various VSU buildings near busy cross sections on Patterson Street and the location of a popular gated parking lot (number 24). In addition to this, the Admissions Building (25), Nevins Hall (23), and Library (29) can be seen.

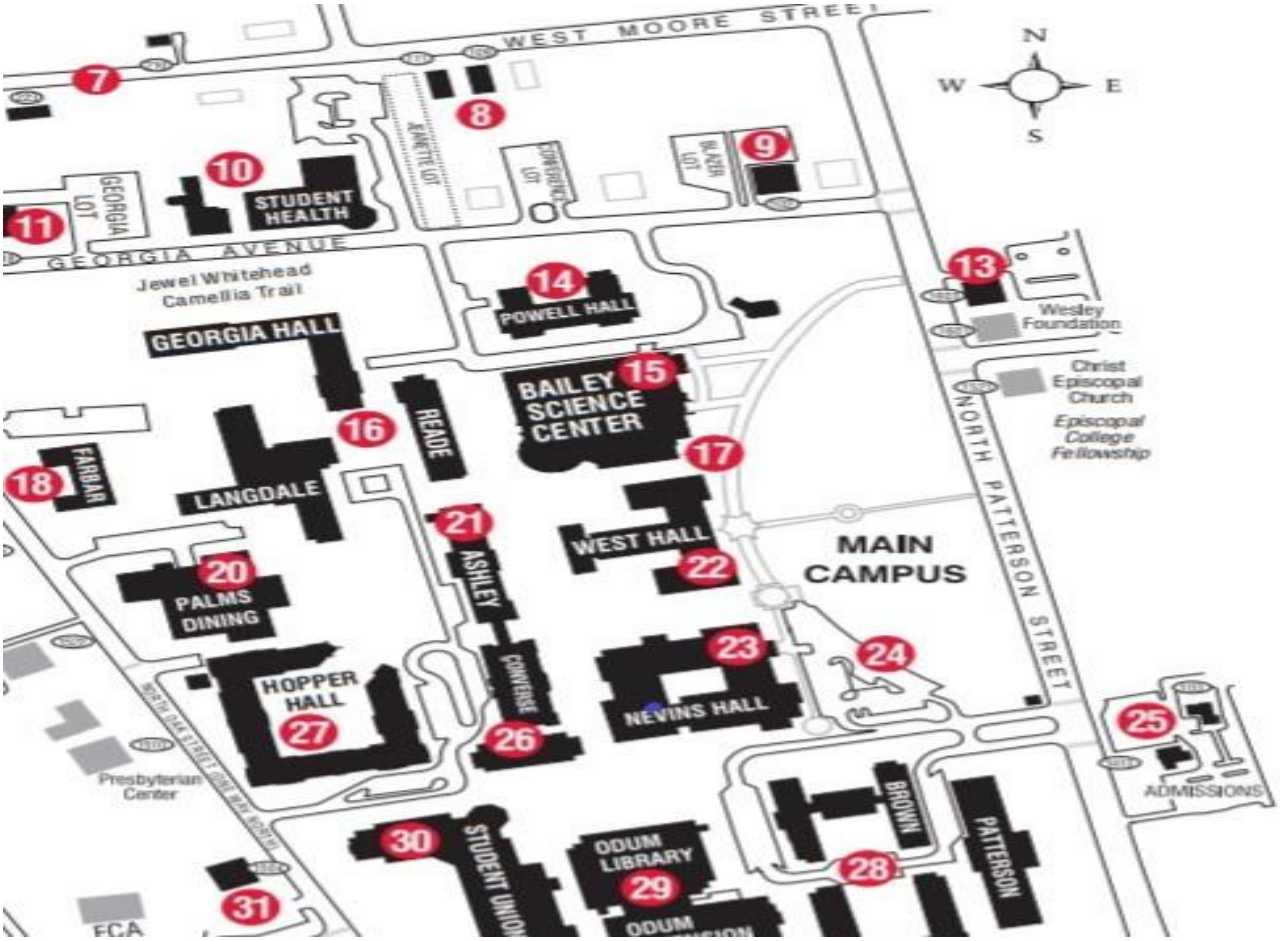


Figure 1D: Map of Valdosta State University along North Patterson Street

Further Details on VSU Campus:

The following Figures illustrate the gated parking area which causes additional distraction to VSU students when driving along Patterson Street.

Figure 2D: A view of the gated parking in front of Nevins Hall in the direction of Patterson Street.

Figure 3D: Another view of the gated parking showing a typical car on Patterson street before the intersection and the turn to the parking lot.

Detailed Organizational Chart (City of Valdosta):

The following Figure shows a detailed organizational chart of the City of Valdosta.

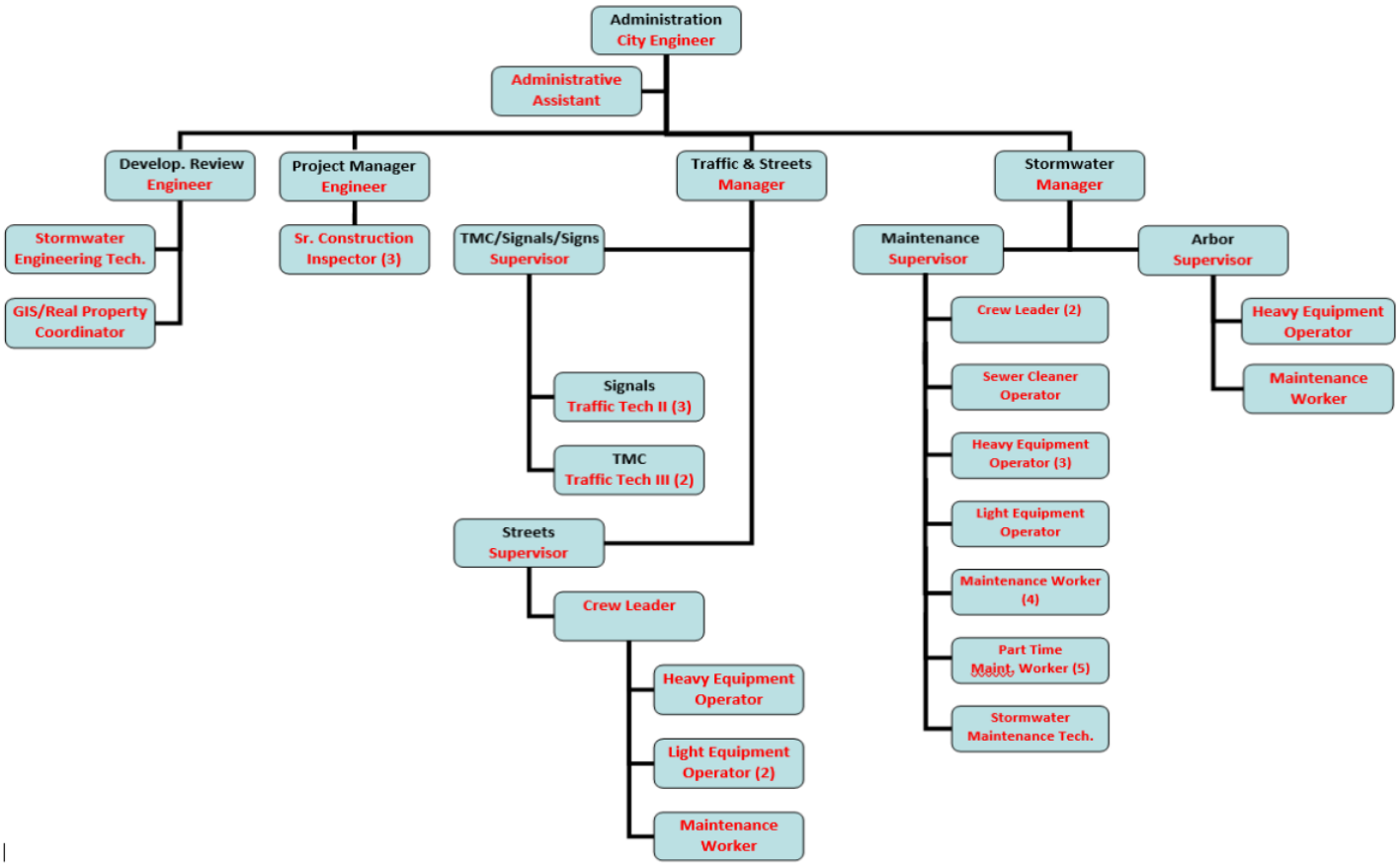


Figure 4D: Organizational Chart of the City of Valdosta.

Inside the City's TMC:

The following Figure shows students learning about traffic engineering and traffic management at the City's TMC.

Figure 5D: Students learning at the City's TMC.

Kimley-Horn – Traffic Signal Timing Study:

The city of Valdosta and Kimley-Horn have performed a Traffic Signal Timing Study to optimize forty-four signalized intersections. Other objectives of the study were to reduce fuel consumption, vehicle emissions, driver delay, and driver stops/starts. A final report on the study was prepared by Kimley-Horn in June 2017. Based on the findings of this study, signal timing of a number of intersections were upgraded and retimed, while operational improvement was performed on other intersections. The tasks completed in this study included data collection, operational analysis of each signalized intersection, timing plan development for the typical weekday peak periods, as well as weekend and holiday peak periods, before and after time evaluations and several other tasks. Excerpts from this study are included below.

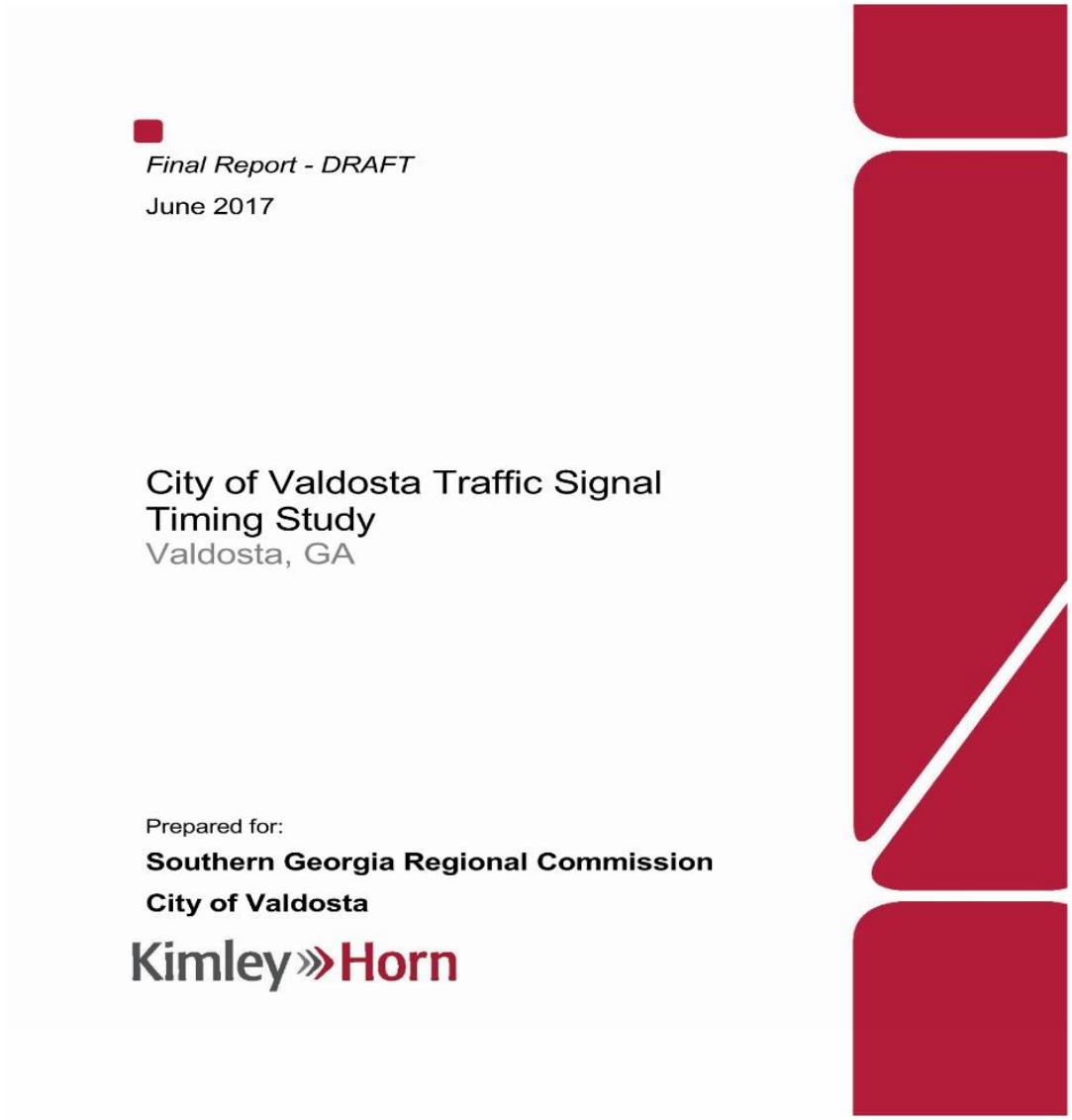


Figure 1: Project Intersections

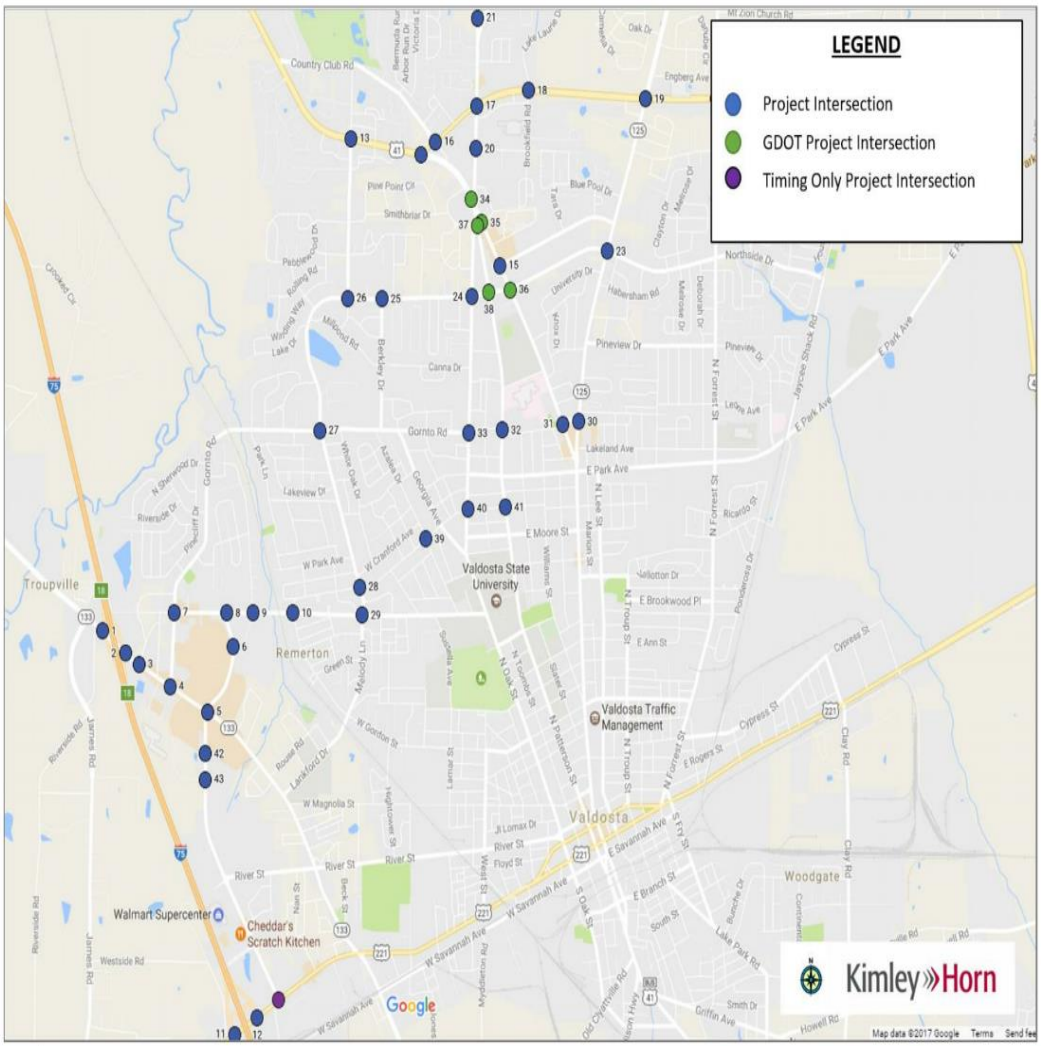
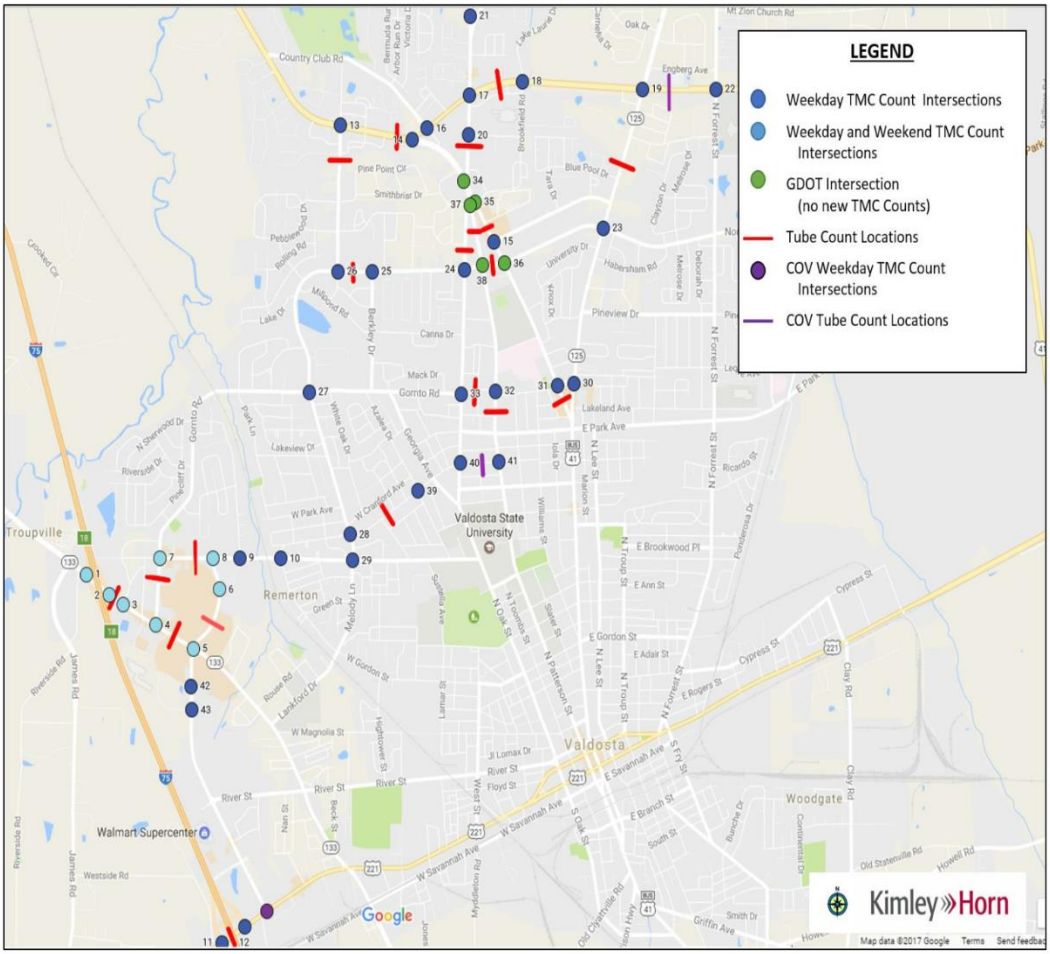


Figure 2: Traffic Count Locations



3.0 EXISTING CONDITIONS ANALYSIS

An evaluation was completed of the existing conditions for each of the study intersections within the City of Valdosta. This evaluation included an analysis of existing signal operations, including an assessment of the existing capacity and level-of-service (LOS) for each intersection during a typical weekday morning (AM), mid-day (MD), and evening (PM) peak period.

SYNCHRO ANALYSIS

As discussed earlier, there were a number of field observations, traffic counts, signal settings, and miscellaneous data collection efforts undertaken to collect all of the data needed to evaluate the existing conditions of the corridors. This data was compiled in *Synchro 9*, which is a signal timing/optimization/simulation software package accepted in the industry.

SYNCHRO MODEL DEVELOPMENT

Kimley-Horn created an existing conditions *Synchro* network file for the weekday AM, MD, and PM peak periods. These models were used as the base files from which the existing conditions analysis was performed. Geometric characteristics from the field survey notes were coded into *Synchro*. These characteristics included the following items for each intersection approach:

- Number of lanes
- Lane configurations (left, through, right or shard use)
- Storage bay lengths to the nearest five (5) ft increment
- Approach percent grades
- Link speeds

The traffic data was entered into Synchro using the traffic counts. The peak hour factors (per movement) and percent trucks (per movement) were also entered into Synchro for each peak period analyzed. The existing local controller settings, timing data, and coordination settings were entered into the model from the databases.

EXISTING SIGNAL OPERATIONS

Most of the study intersections are operating actuated-coordinated during the during the day and Free (actuated-uncoordinated) overnight. The remaining study intersections operate Free during all hours of the day.

During the AM peak hour, the actuated-coordinated signals operate via four (4) different cycle lengths and fourteen (14) intersections operate via Free operations. During the MD peak hour, the actuated-coordinated signals operate via four (4) different cycle lengths and fifteen (15) intersections operate via Free operations. During the PM peak hour, the actuated coordinated signals operate via five (5) different cycle lengths and fourteen (14) intersections operate via Free operations.

EXISTING TRAFFIC FLOW PATTERNS

Traffic flow patterns were determined by reviewing the turning movement count (TMC) data included in **Appendix A**. Based upon these volumes, distinct traffic flow patterns were found for each peak period.

During the AM peak period approximately sixty (60) to seventy (70) percent of traffic is headed inbound, southbound along towards downtown Valdosta along the majority of the project corridors. Approximately sixty (60) percent of the traffic travels westbound along Inner Perimeter Rd during the AM peak. As anticipated, traffic during the MD peak is essentially even in all directions along majority of the project corridors. For the PM peak period, approximately fifty-five (55) to seventy (70) percent of the traffic is headed outbound away from downtown Valdosta along the majority of the corridors. Traffic progression along Inner Perimeter Rd is approximately even in both directions. These traffic flow patterns are consistent with the 2011 Signal Timing Optimization Study completed by KH.

EXISTING INTERSECTION LEVELS-OF-SERVICE

The existing conditions of each intersection within this group were analyzed using *Synchro/SimTraffic 9* software. *Synchro* provides capacity analysis consistent with the methodologies set forth in the *2000 Highway Capacity Manual (HCM)*.

Level-of-service (LOS) is used to describe the operating characteristics of a road segment or intersection in relation to its capacity. LOS – per the *HCM* – is defined as a qualitative measure that describes the operational characteristics in a traffic stream, generally in terms of service measures such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort/convenience. The *HCM* describes six levels of service, LOS A through LOS F, with A being the best and F the worst. An intersection LOS of D or better with turning movements at LOS E or better is generally the accepted minimum threshold for operating conditions at signalized intersections.

Table 2 summarizes the intersection LOS and average vehicle delay per intersection for the existing conditions for each of the signalized intersections in the City of Valdosta, while the detailed capacity analysis summaries can be found in **Appendix B**.

Table 2: Existing Conditions LOS, Average Delay (sec/veh)

#	Intersection	LOS (Average Delay)		
		AM Peak Hour	MD Peak Hour	PM Peak Hour
1	St. Augustine Rd @ I-75 SB Ramp	C (30.3)	C (23.7)	C (24.5)
2	St. Augustine Rd @ I-75 NB Ramp	C (26.4)	C (16.1)	B (17.0)
3	St. Augustine Rd @ Twin St	A (6.9)	A (9.3)	B (13.1)
4	St. Augustine Rd @ Gornto Rd	C (26.5)	C (33.9)	D (41.4)
5	St. Augustine Rd @ Norman Dr	D (39.0)	D (41.3)	D (52.3)
6	Norman Dr @ Mall Ent	B (12.4)	C (34.8)	C (32.5)

7.0 TRAFFIC RESPONSIVE

KH evaluated the need for traffic responsive throughout the City of Valdosta. For traffic responsive to produce noticeable benefits over traditional time of day plans, there has to be a high frequency of inconsistent traffic patterns. Corridors which are highly likely to be impacted by incidents, extreme weather, detour routes, shift work, special events, or holiday events are good candidates for traffic responsive systems. Traffic responsive requires a higher level of analysis and operational maintenance, so the occurrence of these types of disruptions has to be high enough to provide enough benefit to outweigh the potential challenges of managing a traffic responsive system. Throughout the system, there are several locations which experience somewhat unpredictable traffic patterns.

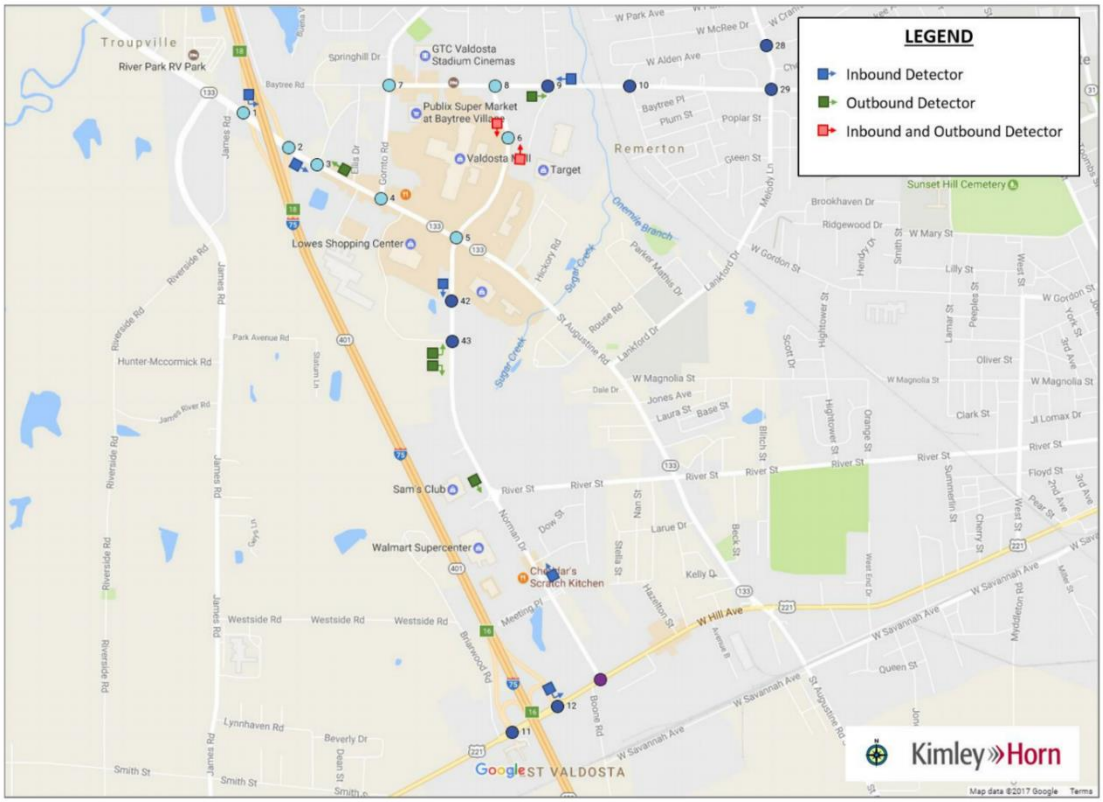
The City of Valdosta will be upgrading their controller and central server software to MaxTime/MaxView. Within the MaxTime/MaxView software the traffic responsive program can assign certain intersection detectors to collect historic count data to determine thresholds for each timing plan. The City of Valdosta currently uses upstream mainline detection along with stop bar detection for side street and left turns. For traffic responsive to be successful, the detection system needs to be heavily maintained to ensure traffic responsive is working correctly, and in most cases some additional detectors are required due congestion creating volume count discrepancies at the intersection detectors.

The North Zone of the system, currently, does not experience frequent unpredictable traffic patterns that would warrant traffic responsive timing over providing traditional time of day plans. Flush plans for incident management could be developed for this area and could be called up when needed by the City of Valdosta's Traffic Management Center (TMC).

The Middle and South Zones of the system, do experience somewhat unpredictable traffic patterns that could potentially warrant traffic responsive timings. The area around the Valdosta mall and Lowndes High School do generate events which could warrant traffic responsive, however, these events are typically scheduled or known events where it would be easy to simply put a special time of day plan in and schedule the timing plan to come in during those events. Examples of this are football games Friday nights at Lowndes High School and the Holiday shopping season around the mall.

The consistency of these disruptions does not appear to be frequent enough to recommended traffic responsive timing over providing traditional time of day plans with additional special event and holiday timing plans. If traffic responsive is considered for this area, the special events in the area have similar traffic flow patterns of vehicles traveling inbound or outbound to the AM and PM plans, respectively. The intersection detectors can be set to collect historic count data for these traffic flow patterns and then reviewed to determine if the flow patterns are varying from the standard time of day schedule and timing plans to warrant traffic responsive. The intersection detectors and movements which could be set to collect historic count data to monitor inbound, outbound, or both traffic flow patterns for this area are illustrated in **Figure 17**.

Figure 17: Proposed Holiday Cycle Lengths



8.0 ITEMS FOR FURTHER CONSIDERATION

Each of the project intersections were operationally analyzed by studying all the data collected. By observing the traffic flow patterns and the existing LOS, delay, and crash histories for each intersection movement, an analysis was made to determine any modifications to the intersection that would enhance its operation. Also, any deficiencies in regards to the *Manual on Uniform Traffic Control Devices*, *2011 Edition* (MUTCD) were noted, and improvements were recommended. Operational issues that were addressed included possible geometric modifications and pavement marking/lane utilization changes.

LONG-TERM CONSIDERATIONS

As the area surrounding Oak St Ext between N Ashley St and Inner Perimeter develops, the widening of Oak St Ext from Smithbriar Dr to Cherry Creek Rd should be considered. In existing conditions, the northbound right turn from N Ashley St onto Oak St Ext experiences heavy queuing and the geometry of the intersection would allow for an exclusive right-turn lane. This would require the widening of Oak St Ext to a four or five lane section through Inner Perimeter Rd.

DATABASE UPGRADES

When the City of Valdosta upgrades their signal timing and central server software to MaxTime/MaxView additional considerations can be made to improve the operations of the signals in the network. Along with flashing yellow upgrades lead/lag and double serve left turn phasing operations should be considered. The lead/lag left turn phasing allows for the left turn phases to be adjusted to provide greater throughput along the major and minor corridors of the system.

Additionally, MaxTime provides faster transitions between TOD patterns and will help to maintain coordination along the corridor. This will also provide the opportunity to tighten time-of-day schedule to operate the bigger cycle lengths for shorter periods of time during the peak periods .

TOD SCHEDULE

The City of Valdosta has received complaints about long cycle lengths during the early AM hours and even hours, before the AM peak and after the PM peak period. During field implementation and fine-tuning it was recommended to keep the TOD schedule as proposed due to the long transition times and volumes being and ending during those times. However, if these complaints continue the AM peak period could begin at 06:30 instead of 06:00 and the Off-peak period could end at 20:30 instead of 21:00 on all corridors except the N Valdosta Rd/N Ashley St/N Patterson St corridor north of Northside Dr and the Inner Perimeter Rd corridor east of Brookfield Rd/Lake Laurie Dr. Due to the coordination between the closely spaced vehicles and earlier/later heavy volumes before and after the peak periods it is not recommended that the TOD be adjusted for the northern section of N/Valdosta Rd/N/Ashely St/N Patterson St corridor and Inner Perimeter Rd corridor.

<u>Smart / Connected Vehicle Technology:</u>

The following data sheets and brochures provide further details on the smart, connected vehicle technology. This includes:

1. **Data Sheet: AI-500-085 Series Glance Monitoring Preempt & Priority Field Monitoring Unit**
   AI-500-085 units are currently installed in all 128 intersections throughout the City (as seen in Figure 6D below). These units will be upgraded to allow for preempt and priority capabilities and communication with the TravelSafely smartphone application

2. **Data Sheet: AI-500-065 Series Preempt & Priority In-Vehicle Unit**
   Units to be installed in emergency response vehicles to facilitate communication with traffic signal controllers at signalized intersections, allowing for emergency vehicle pre-emption

3. **Brochure: Emergency Vehicle Preemption**
   Further details on emergency vehicle pre-emption and how the system works

4. **Brochure: TravelSafely – Connected Vehicle and Smart City Solutions**
   Further details on the TravelSafely smartphone application and how the system works (Including the various applications available on the app)

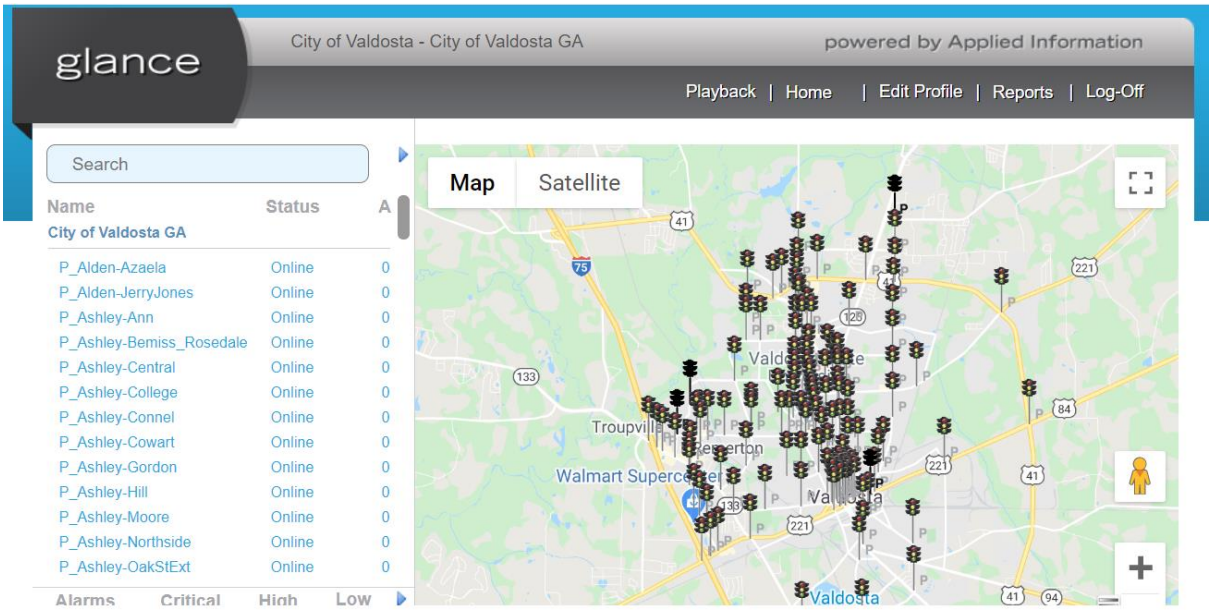


Figure 6D: City of Valdosta – Glance Home Screen

Description of Figure 6D: This figure shows the current system deployed in the city of Valdosta, where 128 intersections are equipped with the Temple/Applied Information intersection monitoring equipment. This equipment is capable of being upgraded to include pre-emption/ priority capabilities and connectivity to the TravelSafely app. Here it can also clearly be seen that the city of Valdosta is situated alongside the I-75 (major north–south Interstate Highway).

1. ***Data Sheet: AI-500-085 Series Glance Monitoring Preempt & Priority Field Monitoring Unit***

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AI-500-085 Series Glance Preempt & Priority Field Monitoring Unit

Overview

The AI-500-085 Glance Preempt & Priority FMU series of controllers provides a cost-effective, easy to integrate means of adding priority & preemption as well as monitoring traffic intersections status and health. The unit has a build in Cellular, GPS and 900MHz radio to make priority and preemption easy to configure and simple to set up. The 19-inch rack mounted device is capable of remotely switching NEMA 5-15 power outlets inside the ITS cabinets. It is designed for extreme temperature applications and has low power requirements, making it suitable for solar powered applications.

The unit comes standard with a built in Ethernet, Cellular Modem, GPS and 900MHz radio. All units come with multiple digital and analog IO as well as 8 relay contacts to trigger preemption commands to the traffic signal controllers. The unit is also capable of sending priority requests directly to the traffic controller using ethernet communications.

The unit works in conjunction with the Glance Platform, providing connectivity to the cloud-based Glance solution. Simply install into your traffic intersection to add Glance priority and preemption as well as monitoring to your traffic cabinets status and health.

Features

- Low cost Internet connectivity solution
- 19 inch rack mount 1 U high
- Controller Passthrough Communications
- Remotely switchable outlets
- Compatible with Glance platform
- GPS enabled for self-locating
- Supports transit priority capable controllers to keep signals in coordination
- Redundant communications supporting both 900MHz radio and Cellular communication
- Simple to configure priority and preemption zone using map based configurator.
- Integral battery back-up for power fail reporting

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Hardware Specification

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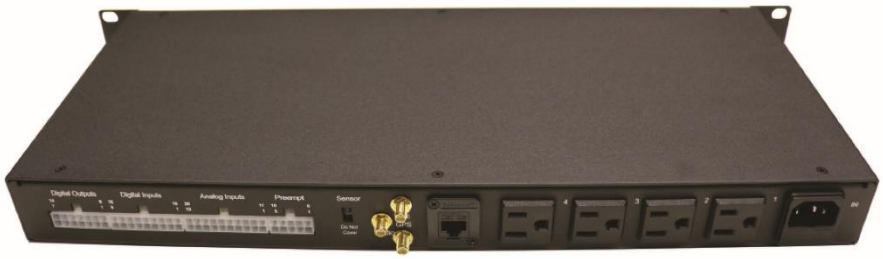
	AI - 500-085
Connectivity	
Cell Modem	Yes
Wi-Fi	No
Ethernet Port (10/100Base-T)	Yes
900 MHz Radio	Yes
GPS	Yes
Industrial I/O	
Analog Inputs	8 (4 as 120VAC/12-28VDC selectable, 4 as 12-28VDC only)
Digital Inputs	8 (4 as 120VAC/12-28VDC selectable, 4 as 12-28VDC only)
Digital Outputs	10 (2 as NO/NC Relay, 8 as 24VDC ground true)
Power	
Outlets	NEMA 5-15 (4 x 120V, remotely switchable rated 15 amp total load)
Miscellaneous	
Operating Systems	µC/OS-II
Manual Preempt Selector	Yes
Operating Temperature	-40°C to 80°C
Humidity	5-95% non-condensing
Dimensions	17.5" W x 1.75" H x 7.5" D
Mounting	19 inch rack mount 1U
Input Voltage	120V AC
Real Time Clock	Yes
Flash Disk	Yes
Battery Backup	Yes
Also suitable for…	
Intersection Monitoring	Yes
Scheduling	Yes

** Custom configurations available for volume orders



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2. *Data Sheet: AI-500-065 Series Preempt & Priority In-Vehicle Unit*

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AI-500-065 Series
Glance Preempt & Priority In-Vehicle Unit

Overview

The AI-500-065 Glance Preempt & Priority In-Vehicle series of controllers provides a cost-effective way of adding priority & preemption to your emergency and transit vehicles. The unit has a build in Cellular, GPS and 900MHz radio to make priority and preemption easy to configure and simple to set up. The in-vehicle unit monitors emergency signals, indicators and ignition switch to have the ability to automatically request priority/preemption at the traffic intersections.

The unit comes standardard with a build in Ethernet, Cellular Modem, GPS and 900MHz radio. All units come with multiple digital and anlalog IO to monitor the vehicle status. The unit utilizes enhanced GPS module with dead reckoning. This allows the system to still track the vehicle even when the vehicle is in a tunnel or under an overpasses.

The unit works in conjunction with the Glance Platform, providing connectivity to the cloud-based Glance solution. Simply plug install into your in-vehicle unit to add Glance priority and preemption as well as monitoring of location and situation of all your vehicles.

Features

- Low cost Internet connectivity solution
- Monitor emergency and transit vehicles in real time from a simple browser
- Cellular & 900MHz radio redundancy
- Perform priority checkin requests at any distance from the traffic controller with Cell connection
- Remote Firmware Updates Available
- Local data storage, supporting store and forward schemes when no connection
- Enhanced GPS with dead reckoning and OBD-II interface for wheel revolutions
- Easy to Install

Call us today to get started at **678.830.2170** or email us at **sales@appinfoinc.com!**

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Hardware Specification

applied INFORMATION

	AI-500-065
Connectivity	
Cell Modem	Yes
900MHz Radio	Yes
Ethernet Port (10/100Base-T)	Yes
GPS	Yes
Enhanced GPS with dead reckoning	Yes
Industrial I/O	
Analog Inputs	4
Digital Inputs	6
Digital Outputs	2
OBD-II interface	1
Miscellaneous	
Operating Systems	µC/OS-II
In Service Light	Yes
Operating Temperature	-40°C to 80°C
Humidity	5-95% non-condensing
Dimensions	7.250" x 5.440" x 1.693"
Input Voltage	10-30v AC or DC
Real Time Clock	Yes
Flash Disk	Yes
Battery Backed Memory	Yes
Also suitable for…	
Bus and Light Rail Priority	Yes
Vehicle monitoring	Yes
Scheduling	Yes

** Custom configurations available for volume orders

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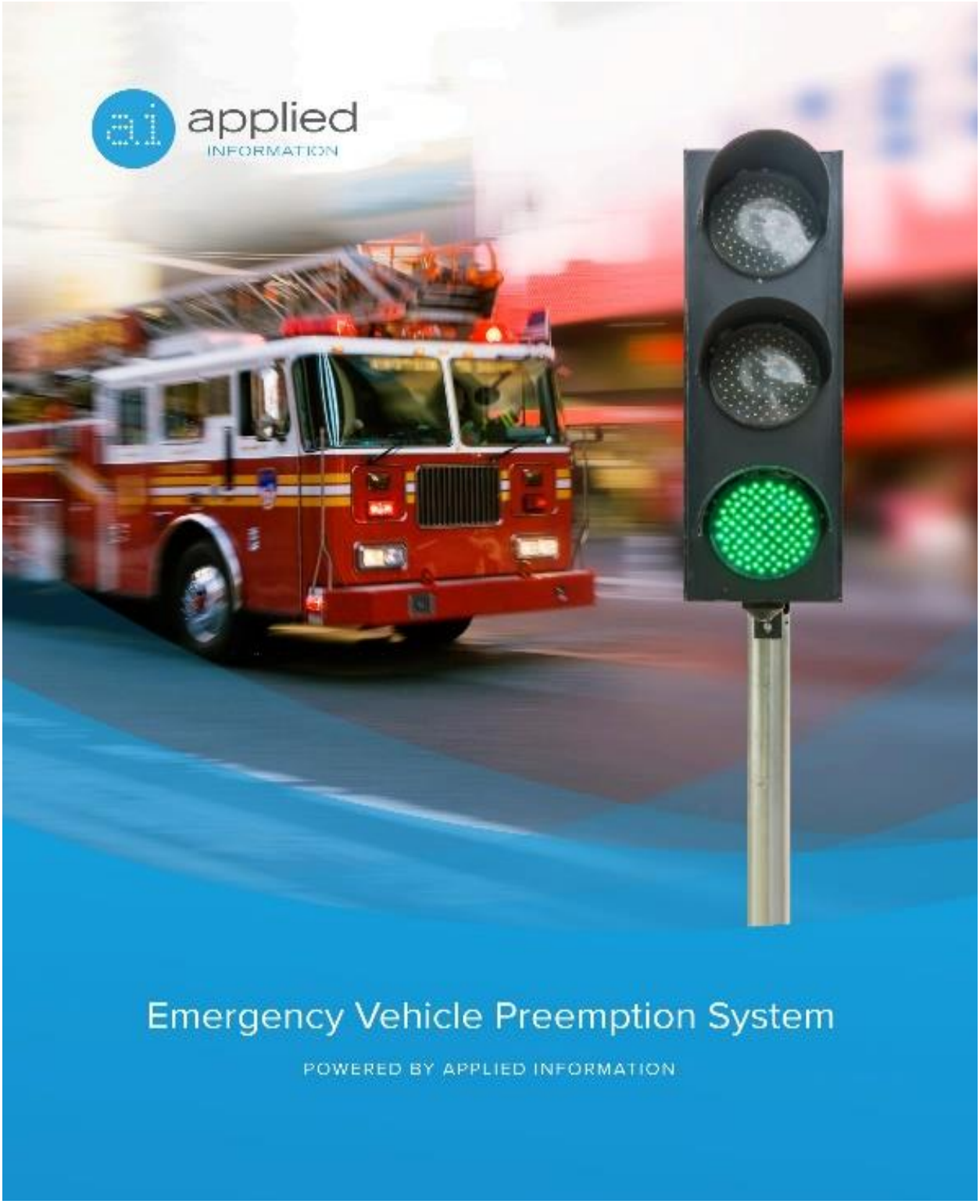
3. Brochure: Emergency Vehicle Preemption



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INFORMATION

CLEAR THE WAY FOR PRIORITY & PREEMPTION

The Glance™ Priority and Preemption suite of products makes it easier and safer for emergency vehicles to reach citizens in need by clearing the traffic ahead of them, giving them green lights at intersections, and bringing all other traffic safely to a halt.

Improve Safety & Expedite Response Times

In most American cities, emergency response times are only increasing as traffic gets worse. The Glance preemption system is an efficient and cost-effective way to take action. By giving preemptive green lights to emergency responders, you can clear the traffic blocking their route and get emergency responders to their destination faster and more safely.

- The Glance priority and preemption system is simple to install and uses a map-based application to configure the priority and preemption zone.
- The integrated devices work over both 900MHz radio and cell, ensuring that if one form of communication is unavailable, the other will still work.
- The GPS used in our in-vehicle units is enhanced with "dead reckoning," so the device can still calculate and track the vehicle's locations even in places like road tunnels or under overpasses.

"The drivers know they've got a green light in front of them, they know that everyone else has a red light, and they know the traffic is going to move ahead of them. ***This is the biggest improvement to response times that I've seen in my career."***

- Chief Gibbs, Marietta, GA

Save time. Save lives. Get connected.

EXPERIENCE THE GLANCE SYSTEM

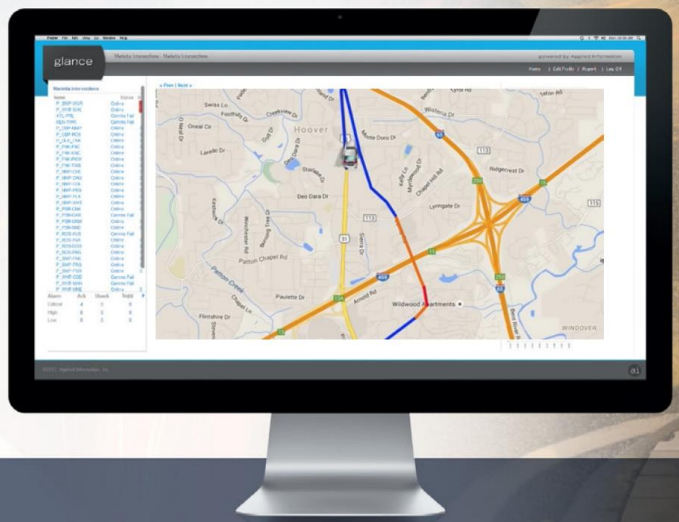
Green to Scene™
Vehicle crashes accounted for over 25% of firefighter fatalities in 2017. Proactively clearing traffic and bringing the rest of the intersection to a halt can help prevent these crashes.

Faster Response Times
Adaptive preemption and priority systems clear traffic ahead of a vehicle's arrival, which can reduce response times by as much as 20% .

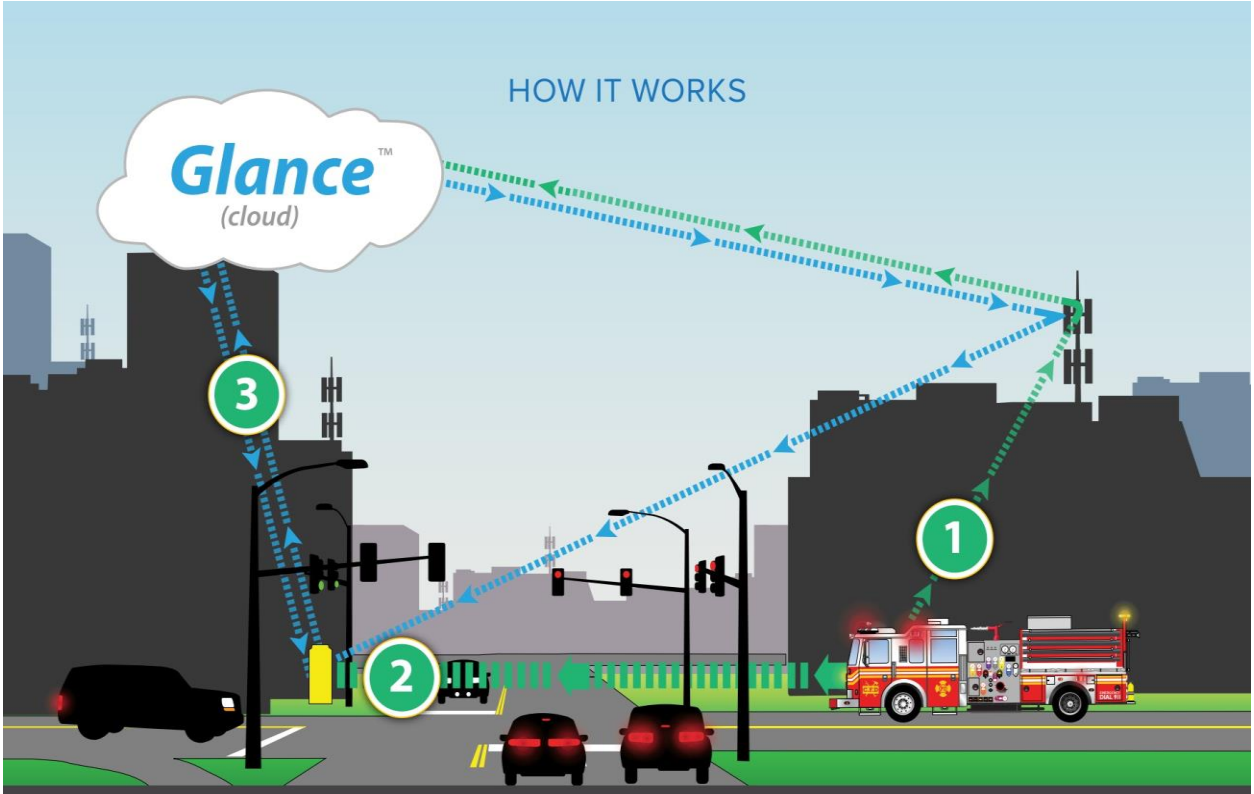
Easy Install
The Glance system is easy to install and maintain. Hardware retrofits into existing cabinets and self-locates for quick set-up.

Next Generation Technology
Glance powers the system with a combination of cellular and GPS technology, making it more efficient than optical systems.

Improve Your ISO Rating
Response times are a critical component of ISO ratings. With Glance, you can help improve your score to benefit citizens and fire departments alike.



Glance tracks all emergency response trips and automatically calculates the average response time, 90th percentile response time, and availability of every vehicle.



1. Notify

The moment a route starts, the in-vehicle unit uses a cellular signal to alert Glance of the emergency call.

2. Preempt

Glance processes the route and communicates wirelessly with the traffic cabinet to clear traffic ahead of the vehicles arrival.

3. Adapt

Glance monitors route progress in real time and dynamically adapts preemption requests as the situation changes.

Powering the Smart City

Applied Information seamlessly links all your wired, wireless and cellular ITS devices. The Glance Smart City Supervisory platform connects intersection controllers, preemption systems, school beacons, road signage, live video and more into a single, easy-to-use web-based application. Partner with Applied Information and let our team of experts connect your organization so your transportation system can save lives, improve traffic and drive commerce.

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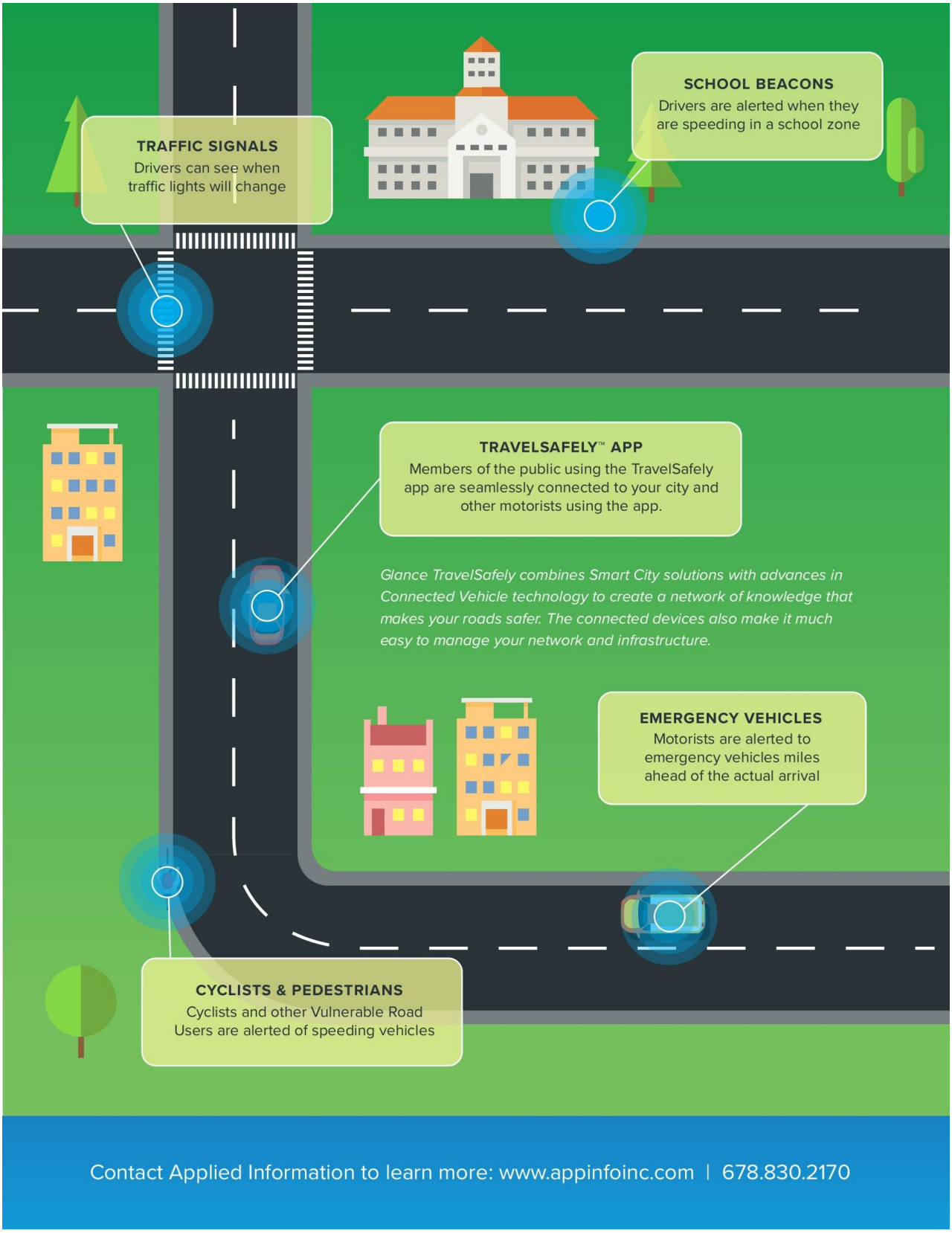
4. Brochure: TravelSafely – Connected Vehicle and Smart City Solutions

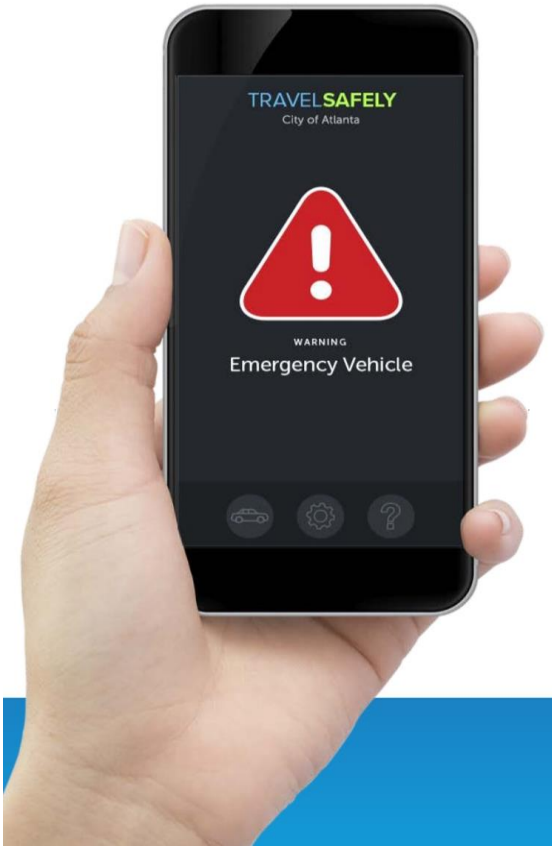

TRAFFIC SIGNALS
Drivers can see when traffic lights will change
SCHOOL BEACONS
Drivers are alerted when they are speeding in a school zone
TRAVELSAFELY™ APP
Members of the public using the TravelSafely app are seamlessly connected to your city and other motorists using the app.
Glance TravelSafely combines Smart City solutions with advances in Connected Vehicle technology to create a network of knowledge that makes your roads safer. The connected devices also make it much easy to manage your network and infrastructure.
EMERGENCY VEHICLES
Motorists are alerted to emergency vehicles miles ahead of the actual arrival
CYCLISTS & PEDESTRIANS
Cyclists and other Vulnerable Road Users are alerted of speeding vehicles
Contact Applied Information to learn more: www.appinfoinc.com | 678.830.2170

TravelSafely™ saves lives and improves traffic.
The future is now. Bring this revolutionary,
and life-saving technology to your city.

GLANCE
TRAVELSAFELY™

Revolutionize Traffic in Your City.

Glance TravelSafely™ is a new smartphone application, developed by Applied Information, that uses cutting-edge technology to make the promise of connected vehicles a reality. Harness the power of connected vehicle technology to make your city smarter, and your residents safer.



Leverage Smart City Technology

The Applied Information Glance Smart City Supervisory System™ connects your intersections, school beacons, and emergency vehicles to form a cohesive, connected system.

Traffic Signal

Glance will connect your intersection cabinets so you can remotely control and monitor traffic lights.

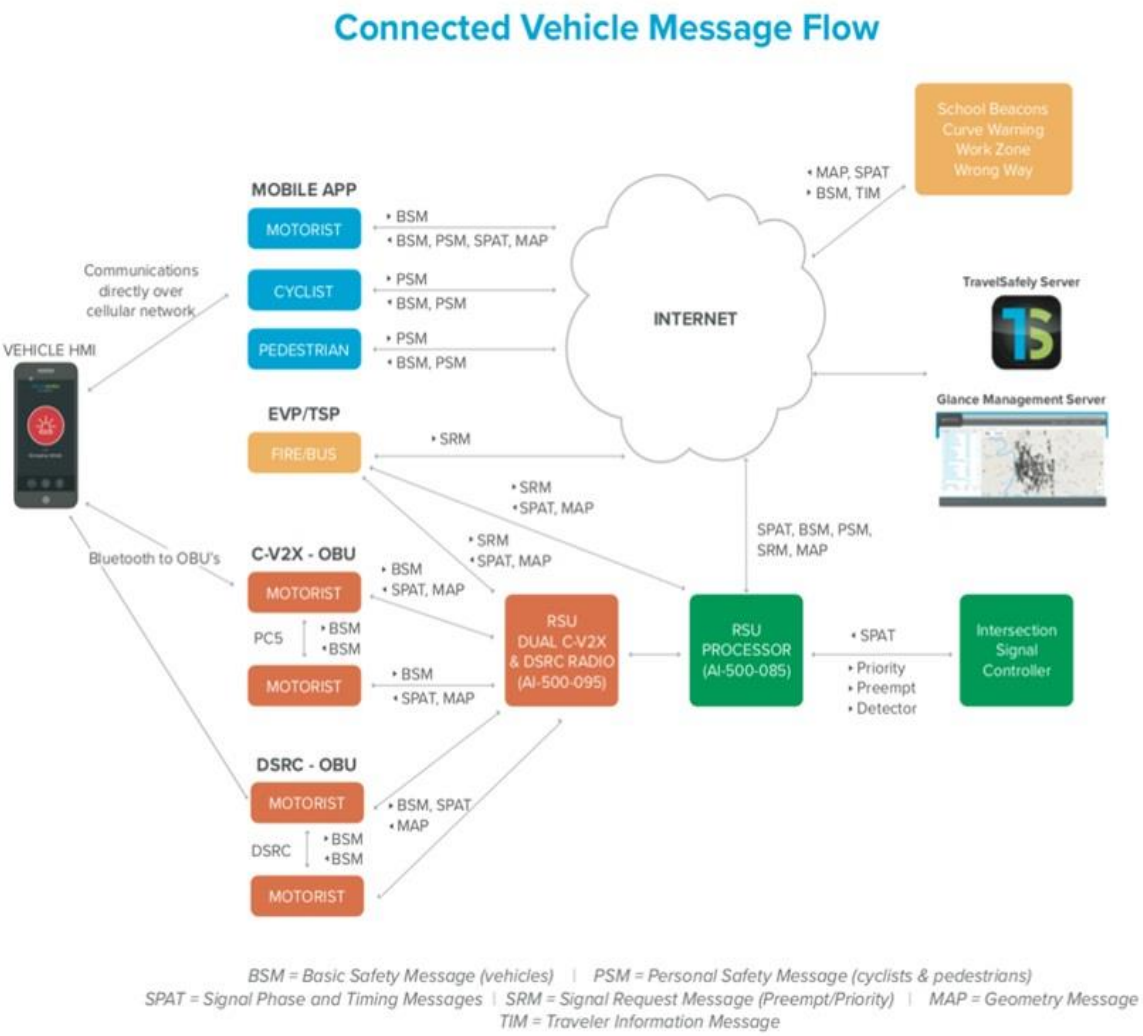
Preemption Systems

Our cellular based preemption systems helps emergency responders arrive safe with ground-breaking technology.

School Beacons

Remotely update timing plans and diagnose failures with Glance.

Get Connected. Save Lives. Improve Traffic.



Applications available on TravelSafely smartphone application: