



Using Innovative Technology to do More with Less

In today's tough economic environment, agencies are constantly being called upon to deliver superior services while limiting expenditure. The new buzz phrase is "doing more with less". At the City of Winter Park, the IT Department has been working with other Departments to leverage technology, specifically Information Technology, to ensure that City users and citizens receive superior services without breaking the bank. To that end, several projects were implemented at the City. These projects are outlined below.



Biometric Authentication

With nearly every facet of enterprise operation now dependent on or supported by IT systems, the stakes involved in identity-related security risks have risen dramatically in recent years. Business risks ranging from minor policy and compliance violations to major business losses occur every day. All it takes is a single person with the wrong privileges and intent.

To minimize the chances of user's login credentials being compromised, the IT Division has improved network security across the city campus by making changes to the city's Network access control Policy (NAC). All desktop workstations, along with most laptops and MDTs, are now equipped with a fingerprint reader. City employees are required to authenticate (log in) via the biometric device (fingerprint reader) in order to use the city's network and computing resources.

The Biometric software tightly integrates into the City's existing systems, including Active Directory Services, Naviline and "green screen" AS/400 applications. The Privacy Manager Pro aspect of the chosen Biometric software enables sensitive information to be protected through digital signing and encryption of email and documents.

Additionally, Criminal Justice Information System (CJIS) will require strong authentication beginning in October 2010. According to the CJIS mandate, the city needed to implement "advanced authentication" such as biometrics, public key infrastructure, smart cards or token-based devices in addition to typical security methods such as usernames and passwords. Biometric authentication addresses the city's need for a security solution that could not be shared between users but wouldn't get in the way of performing critical public and emergency services. Because of the ease-of-use and widespread acceptance of the Digital Persona biometric solution by city employees, the IT Division has already met the deadline for compliance with the CJIS Security Policy.



SMART SCADA

The City implemented the Symphony Harmonious pump and flow management system being offered by Data Flow Systems.

Symphony utilizes SCADA to coordinate the system-wide operation of sewer lift stations for the purpose of reducing force main pressures and equalizing flow into a wastewater treatment plant. The result is a significant reduction in energy costs and a solution to daily peak-flow problems. The results are diminished pump run-times, lower maintenance costs, and reduction of energy consumption. At this date, we have observed a pump run time reduction of twenty four (24%) percent, with an energy cost reduction of thirty-nine (39%) percent. Additional benefits include:

- Lower demands on power grid
- Reduced carbon footprint
- Recapture of capacity due to efficiency

The City case study can be found at <http://www.dataflowsys.com/products/brochures/symphony-pump-flow-management.pdf>

What really makes this technology work is the leveraging of existing IT infrastructure that ties all of the elements together. The system uses a mixture of wireless and wired technologies to communicate among the various devices used to control pump station operations. The SCADA System offers a means to communicate with RTUs over a network connection. The central site equipment consists of a SCADA server, central transceiver unit, and one or more operator terminals. The SCADA server controls polling sequence, collects and stores data and hosts the software for users to access. Operators access the system over the local network and the internet. Multiple users can simultaneously monitor, control, receive alarms and run reports from their PC based workstations. The system overview can be found at

<http://www.dataflowsys.com/system-overview/scada-system-overview.html>



Fuel Management

The City of Winter Park's Fleet Maintenance department manages two fueling sites, one at the Public Safety complex and one at the Central Utilities complex on Howell Branch Road. Both sites were upgraded in 2009 with the installation of a fully automated fuel management system (FMS) from Coencorp, Inc. The system allows unattended secure fueling to authorized vehicles and equipment. Each authorized vehicle is equipped with a Vehicle Data Unit (VDU) which communicates real-time via radio frequency technology from the vehicle's power control module (on board computer) to the FMS central database.

Information Technology plays an essential role in making this system function. Each VDU is equipped with secure, short-range proprietary radio ensuring data integrity and protecting the network from external intrusion. The VDU automatically identifies the vehicle, mileage and hours of use, trip miles, trip idle hours, vehicle engine fault codes and transactional information from the fueling process.

Using wireless technology, all vehicle information is transferred to the central database automatically each time the vehicle passes within 300 feet of either fuel island. Additional antennae will be deployed to other City buildings. This allows vehicle information to be transmitted to the central database from multiple locations. The FMS also communicates directly with the in-tank monitoring systems. Fuel levels and leak detection devices are automatically monitored via wireless technology.

Advantages of this system include:

- Dependable unattended access to fuel
- Proactive diagnosis of vehicle fault codes leading to more cost efficient maintenance
- Effective preventive maintenance based on vehicle mileage



Emergency Notification and Alert System

The City recently implemented an Emergency Alert Network codenamed OUTREACH. OUTREACH is a comprehensive community alerting network that combines the elements of outdoor warning sirens with ability to communicate quickly using today's popular personal electronic devices and telephones. OUTREACH allows us to alert and communicate with our residents keeping them informed about any potential emergency. The siren network also allows our emergency managers the ability to generate voice messages throughout our downtown area including Central Park and on the campus of Rollins College, having the option to control crowds as well as to direct the students on the Rollins campus in the event of an emergency is critical to their safety. With the power and flexibility of OUTREACH, we do anticipate the network being used during hurricane season to keep the community informed and safe. The electronic portion of the network can also be used in the future to inform specific neighborhoods of situations such as power outages and boil water alerts as well.

Today's technology allows OUTREACH to connect the community like never before. Through multiple methods of communication OUTREACH has the ability to send messages to voice, text messaging, email and on-screen pop-up locations. Through a web-based access portal anyone has the ability to log-on to the OUTREACH database and update their notification data. Local phone banks provide most of the system's 47,000 landline exchanges, but OUTREACH stores thousands of additional numbers for cell and text messaging devices. A diverse system of national calling centers allows OUTREACH the speed to work side-by-side with local public safety professionals in making sure the community is alerted to any appropriately identified local emergency situation.

The OUTREACH system allows participants the ability to interact with the messages. Through interactive voice response (IVR) participants can "vote" back to emergency planners their needs or status by simply selecting a pre-designated numerical button on their device. Callers are then mapped to best identify geographically the needs as the emergency progresses. IVR is an extremely powerful tool in the OUTREACH system.

The Rollins College campus community in Winter Park is totally integrated into the City's OUTREACH network. OUTREACH serves as the official notification system of Rollins College in Winter Park. Along with on-campus voice notifications systems, campus administrators maintain a database of calling information for each student and their families. OUTREACH can be used to alert students of any on-campus emergency where access to immediate information can make the difference between life and death. Again, students can use the IVR function to alert emergency managers and Rollins

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campus staff of any needs during an event. One of the most powerful functions in the OUTREACH system is its ability to select who notifications are sent to. The OUTREACH system has the ability to select from one individual to over 50,000 different combinations of notices. Groups of participants can be pre-selected to be notified as well as specific geographically-designated areas of residents. OUTREACH is extremely flexible in its ability to define who receives what message.



LMR Integration

In today's tough economic climate, agencies are constantly being called upon to "do more with less". Technology can play a crucial role in ensuring that this is achieved. One of the areas that the City has identified as potentially having an extremely positive impact on limited funds is LMR (Land Mobile Radio, such as the Motorola system in use by the City) integration. What is LMR integration? It is an interoperability solution that allows a Nextel Direct Connect user can talk directly to a first responder who uses a Project 25 land mobile radio (LMR), creating a new level of interoperability by allowing the two types of push-to-talk services to communicate with each other.

The City of Winter Park is upgrading its 800 MHz system to take advantage of the security and stability offered by a digital system versus the current analog system. This is a very costly upgrade for the City. Each Motorola handheld will cost approximately \$3800 to replace. The solution that satisfies both the technology and fiscal requirements of the City involves integrating with Nextel PTT (IDEN) devices. The goal is to have non-public safety users use an IDEN handheld instead of the expensive Motorola handsets. The benefits of this integration include:

- IDEN becomes a true extension of the LMR system
- IDEN can be used as a secondary or back-up dispatch system
- Conserve/offload limited RF resources
- Cost effective integration of non-critical operations into a dispatch center
- Extend and help fill coverage gaps of private radio systems
- Increased efficiencies through centralized management of disparate system users
- Increased footprint by leveraging the nationwide Sprint/Nextel network
- Decreased cost of operation

From a cost and resource perspective, the benefits are huge. The total number of radios on the LMR system will decrease by an initial number of 105, with the potential of expanding this reduction to as many as 230 radios. This greatly conserves the limited channel resources for Public Safety use, giving first responders greater flexibility and bandwidth. The initial cost saving is \$375,000, with a total potential saving of \$850,000.

Additionally, spares would be readily available as compared to the Motorola system. It typically takes up to two weeks to replace the battery, at a substantial cost, of the Motorola handheld. Repairs could

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take as long as a month! With replacement parts and phones being kept on City property, repairs and replacement will take minutes instead of weeks or months.

Automatic Meter Reading System

For decades, utilities have been installing data collection systems to streamline their operations. By incorporating Advanced Metering Infrastructure (AMI) into daily operations, utilities can take advantage of the latest technology that will provide greater efficiency and make the most of their remote data collection. Customer requirements and business pressures have increased not only the amount of data needed to be collected, but also the frequency of collection.

Fixed base technology answers this need. It offers remote collection of data in greater intervals while reducing overall labor costs. Hourly, daily or weekly intervals are now common options.

Frequent remote data collection provides accurate and timely information to solve numerous problems throughout the utility. The benefits range from maximum use of manpower, to increased revenues, to a comprehensive library of knowledge for the utility.

The City of Winter Park is replacing all of its water and electric meters with a wireless based bidirectional meter reading system. This solution leverages the Flexnet AMI technology provided by Sensus systems. The FlexNet system uses exclusively licensed radio frequencies that are strongly protected. This primary licensed operation assures the utility that data has the greatest probability of reaching its destination than any other system in the marketplace. By holding the primary license, the FlexNet system is strongly protected by FCC regulations and specifies by law that no other applications can share this spectrum without penalty. Other systems with secondary licenses do not share the same FCC protection as primary license users and therefore may not be as effective in a noisy environment. Higher noise levels reduce distance and performance, and increase the need for infrastructure. Through the use of licensed technology, the utility can be assured they have the most reliable system available in the market.

The meter data is transmitted via a mixture of transmitters, tower gateway base station (TGB) and Regional Network Interface (RNI). In the absence of a clear signal to one of the TGBs, the meters can all talk to each other as a sort of ad-hoc mesh network , thereby ensuring that the data gets to its final destination. The data is eventually sent to a data file that is uploaded into the City's billing system, greatly decreasing human input and error.

- Some of the benefits realized by the City are:
- Reduced reading and billing errors

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- Improved efficiency
- Reduction of staff
- Real time outage management
- Map based views to assist in troubleshooting
- Consumption history and practices
- Rapid identification of leaks
- Assist with water conservation by identifying water usage on watering off days
- Saves customers money since staff can notify them of potential leaks
- Meter failure can lead to identifying local or regional issue
- Service level has increased
- Can identify fraud if meter is removed

In conclusion, features such as remote diagnostics, multi meter connectivity, instantaneous reads, licensed frequencies, long range RF transmissions a – add up to great benefits that this economy demands, such as cost savings, reliability and flexibility, through improved operational efficiency over the entire life cycle of the system.