

THE MUNICIPAL

The Premier Magazine For America's Municipalities

November 2018

Technology



INSIDE:

A look at the future of technology with Magellan

Microgrids harnessing resilient energy

Connected vehicles path to safer roadways



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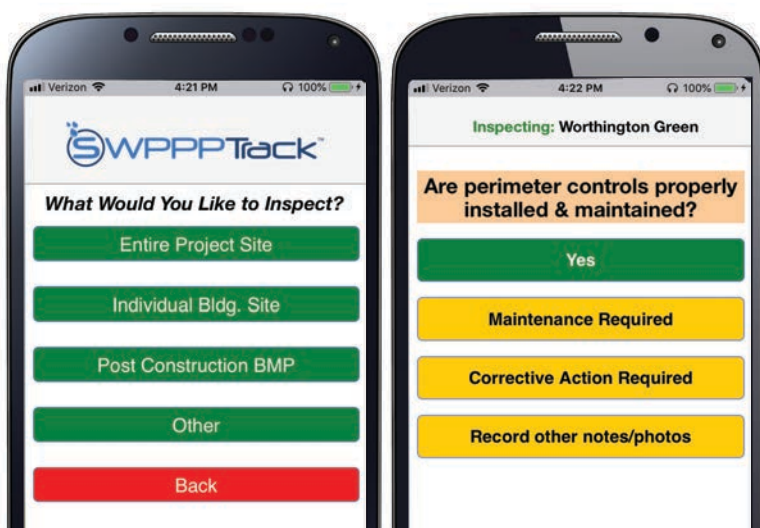
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18 Focus On Technology:

DOT's connected vehicle pilots look to safer roadways

22 Focus On Technology:

Purdue University creates unique pothole detection system

24 Focus On Technology:

Microgrids harness resilient, local energy

26 Focus On Technology:

Sioux Falls, S.D., looks to tech companies for best practices

28 Focus On Technology:

Keeping on track with technology

34 Streets, Highways & Bridges:

Cities spruce up their gateways

36 Parks & Recreation:

Trail networking for health and fun

38 Public Works:

Phoenix addresses skills gap with apprenticeship program

42 Building & Construction:

Quality of life is Kirkland's economic development strategy

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ON THE COVER

Magellan's Return to Route will give cities an entirely different winter experience through improved snow management. By keeping drivers on route, this Return to Route solution ensures fewer route deviations, meaning more efficient salt usage — saving resources and money. Learn how Magellan and its technology can streamline your fleet no matter the season on page 10.



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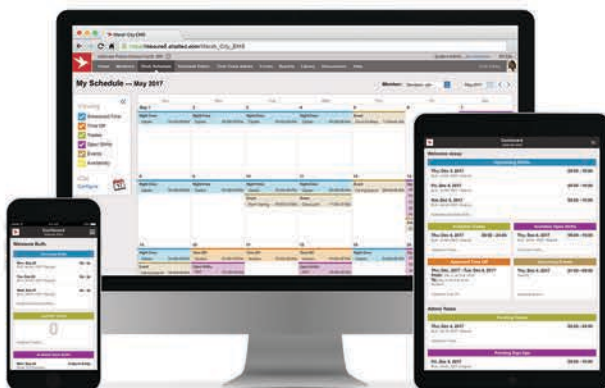
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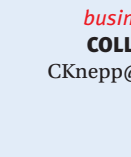
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Departments



Veteran's Day, November 11

- 8 Editor's Note:** *Vision meeting the science to back it up*
- 10 From the Cover:** *Technology streamlines real-time, two-way communication*
- 12 Unique Claims to Fame:** *Ark Encounter, Williamstown, Ky.*
- 14 City Seals:** *Eureka, Calif.*
- 32 City Profile:** *Eclectic mix makes Missoula great place to live*
- 44 Holiday:** *Saluting the Doughboys, gone but not forgotten*
- 48 Conference Calendar**
- 49 Product Spotlights**
- 50 Classified Ads**
- 52 Top 10:** *Top 10 best metro areas for STEM professionals*
- 53 Advertiser Index**

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Vision meeting the science to back it up



Sarah Wright | Editor

OFTENTIMES, I AM REMINDED of one of Arthur C. Clarke's three laws: "Any sufficiently advanced technology is indistinguishable from magic." This is especially true, at least, for the general populace who might not have the most cutting-edge understanding of technology and science — particularly as technology catches up with human vision. It all seems so fantastical.

The most recent story to pop up in my newsfeed was about researchers from the Imperial College London who had developed a genetic technique that could be used to control mosquito populations. Utilizing gene drives to push forward desired pieces of DNA and render female mosquitos sterile, researchers saw a population crash during laboratory testing that took only seven to 11 generations to occur — or approximately a six-month time period. For those who have been to outdoor barbecues or dealt with a mosquito population explosion after a hurricane, this sounds pretty good. Of course, it

has a long way to go before stepping outside the walls of a laboratory.

We live in exciting times, and while cities have not been viewed as particularly tech savvy, many are actually proving to be innovators in their own right, often partnering with researchers, universities and companies to bring amazing technologies within city limits. Perhaps most notable is the push toward 5G, which has been trumpeted as the launching point for truly smart cities and the Internet of Things as everything becomes connected.

Connectivity is making major strides, and for the transportation sector, it is in clear view through the U.S. Department of Transportation's Connected Vehicle Pilot Deployment Program, which is taking place in three locations: New York City; Tampa, Fla.; and on a stretch of Interstate 80 in Wyoming. We will be highlighting the Tampa pilot in this issue of *The Municipal* and what it could mean for the future of transportation, particularly should autonomous and connected intersect.

On another matter related to transportation, Nicholette Carlson will be writing about the partnership between Purdue University and the city of West Lafayette, Ind., to test a new high-tech pothole detection and mapping method, which uses city vehicles and a piece of equipment that just might be in your family room: an Xbox Kinect. The project has had its challenges, but it and the data being gathered are showing promise.

Streets are not the only aspect of cities that are benefitting from the development of certain technologies. Pittsburgh, Pa., a Rust Belt city, has embraced the technological age, welcoming Uber autonomous cars and tech companies like Google to its city limits. It has also championed microgrid technology in a partnership with engineers at the University of Pittsburgh, which will ensure a resilient power grid. Andrew Mentock will be sharing more about these efforts and what they could mean for communities that have higher risks of being impacted by severe weather events like hurricanes.

Another theme covered in this issue will be how cities are positioning themselves to be at the forefront of technological advances or, in some cases, keep pace with them so they are not left behind. The latter is a challenge, to say the least, as advances are coming at a breakneck speed.

I truthfully can't imagine what innovations will be out in 10 years, let alone in the next 20 years; however, the pilots and tests being conducted at the present are promising remarkable possibilities, particularly when it comes to the city of tomorrow. **M**

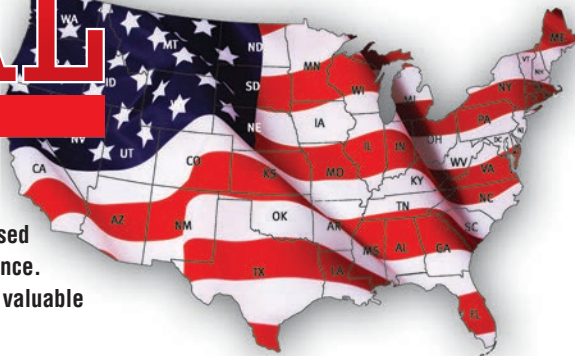


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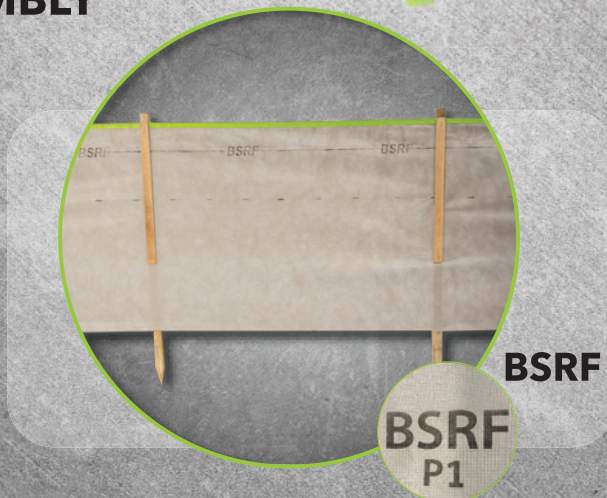
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Technology streamlines real-time, two-way communication

By SARAH WRIGHT | The Municipal

As technology continues to evolve, Magellan and MiTAC Digital Corp. President Pierre Parent spoke with The Municipal on the subject of standouts and how these technologies are making the lives of fleet managers and administrators easier while also encouraging fiscal responsibility. From real-time communication to the neutrality of driver data, Parent takes us through the ins and outs of what fleet administrators can expect in 2019.

Q: Technology continues to make numerous leaps. What have been some of 2018's standouts that should be on municipal officials' radars?

A: It is becoming more apparent that real-time, two-way communication with the field is key. Fleets understand that to be effective, their solutions must have communication during the execution, monitoring and management functions of everyday operations, simplifying the managers' and administrators' jobs, while increasing the safety and productivity of their drivers.

In addition, we're seeing topics around the safety and neutrality of driver data coming to the forefront. Questions surrounding who owns the customer, what data can be used and how is data confidentiality preserved are hot topics, and we continue to watch the debate.

Q: How has this technology made municipal officials' and city employees' lives easier?

A: I'd like to discuss real-time, two-way communication, because that is Magellan's main focus for 2019. Administrators need the ability to keep their drivers locked on route to ensure each driver completes their designated route in the right sequential order, every time. Drivers need the capability of being navigated from point to point, or segment to segment, eliminating paper routes and maps.

This gives drivers the wherewithal to focus on the road and carry out their duties with safety and efficiency in mind. Increased focus on the road means they are less likely to miss stops; however, even if a driver misses or deviates from a stop, the ability to be redirected back to a point or segment they deviated from to ensure near 100 percent route completion is imperative. Fleet managers need a back-end web portal that provides them with a comprehensive dashboard to monitor their fleet, manage routes, update vehicle assignments



Return to Route means less printouts and training are needed, saving municipalities money. If drivers get off route, audible turn-by-turn directions are given to get them back on track. (Photo provided)

and assign tasks. These real-time capabilities also should provide fleets the ability to push updates over the air, including messages, new routes, vehicle assignments and more.

Q: Tell us a bit about your return to route technology and how it is being used by municipalities?

A: Magellan's Return to Route delivers a smart technology approach to designated route management, ensuring experienced, new and temporary drivers complete their road segments or stops in the correct order. All routes can be updated dynamically and over the air from the back-office web portal or directly from the device itself — making it easy for administrators to preschedule and adjust, as needed. Should drivers require a route change, all routes are loaded on the device so the change is quick and easy. The administrators also receive real-time route completion metrics so they can identify problems earlier.

Magellan's fleet tablet and navigation software are designed for the most challenging city environments, namely complex urban canyon environments. When tested, vehicles equipped with Return to Route saw an astounding 91 percent in overall routing accuracy, as compared to 50 percent accuracy with regular GPS receivers without



Magellan's Return to Route can improve snow management by keeping drivers on route. Fewer deviations from routes bring more efficient salt usage, saving resources and money. (Photo provided)

hardware and software optimization. This accuracy is needed to detect which road a driver is on and make sure the routing is correct.

Q: What's one of your greatest success stories when it comes to routing technology?

A: In January of 2016, New York City received a record 27.5 inches of snow, the city's worst snowstorm in history. Record-breaking or not, that was a lot of snow to remove and it stress tested the Department of Sanitation of New York fleet of salt-spreading vehicles. After that particular storm, city officials sought a solution that would better serve them. DSNY also wanted to modernize its fleet and integrate technology solutions, especially those that aligned with departmental goals of increased safety and efficiency. DSNY began rolling out the Magellan navigators in the cabs of its large and small salt spreaders in December 2017, giving drivers turn-by-turn directions to assist them in quickly getting roads salted and plowed efficiently and safely.

There was a lot of anticipation and excitement to see how Magellan would help DSNY perform during the first snow storm of the

season, and the city's feedback was extremely positive. Drivers came back describing how instrumental the solution was while operating their vehicles in near white-out conditions, where street and signs are sometimes indistinguishable. Overall, in a snowstorm that dropped 15 inches of snow, DSNY was still able to clear the roads, meet its service goals and still log fewer drivers hours than normal for this size storm. DSNY chiefs described the solution as the only technology the department has introduced to receive all positive remarks.

Q: How has your technology been used to cut costs while improving service for constituents?

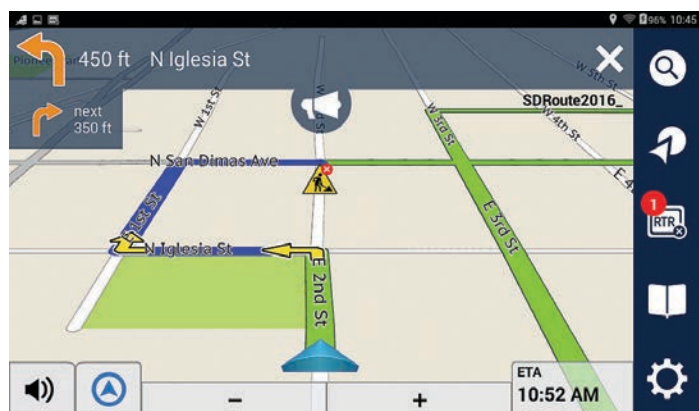
A: To help municipalities cut costs, Magellan's Return to Route means that less training is required when using our solution because drivers no longer need to have lessons on reading maps and following routes. When they do miss a stop or segment, they have an audible, turn-by-turn navigation solution that directs drivers back to the point they deviated from, lowering overtime and fuel costs. Fewer deviations from routes also means more efficient salt usage, saving resources and money.

In the case of DSNY, the city was able to increase performance, cut costs and improve citizen's approval of snow operations. Training times and costs have been cut significantly; new drivers are able to operate as productively as veteran drivers; and the city is easily saving hundreds of thousands of dollars per year thanks to the Magellan Return to Route Solution.

Q: How will technology continue to adapt to users' needs as we enter into 2019?

A: As cities continue to grow, improvements in safety, service and efficiency will need to grow at the same rate or faster. We are seeing some great technology in the industry coming down the pipeline for 2019. The integration of data from the cab to back-end simplifies the driver's job and removes distractions while giving admins a more comprehensive look into what's happening on the road and in their fleet. This improved communication between drivers and operators will boost operational efficiencies, save on fuel and labor costs, and increase safety. **M**

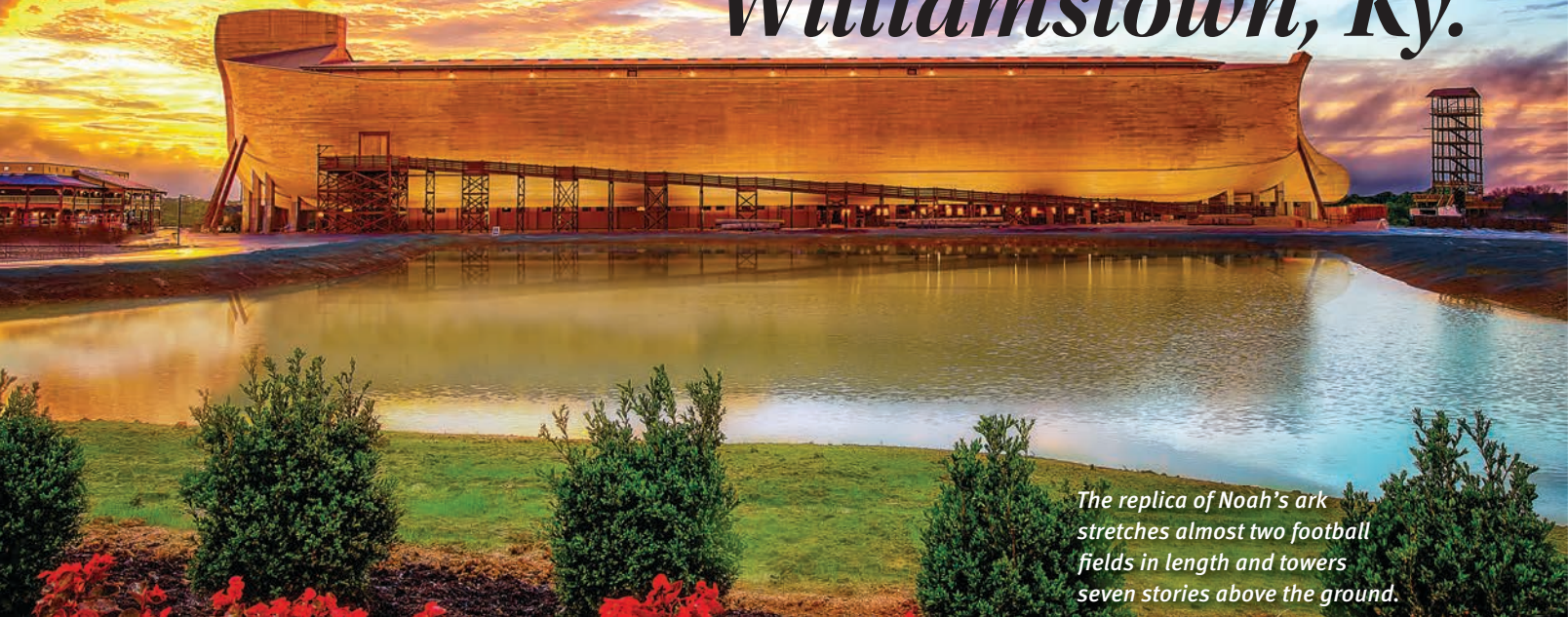
Pierre Parent is the president of Magellan GPS and MiTAC Digital Corp., a wholly owned subsidiary of MiTAC International Corp. He manages three business teams focused on navigation solutions, including automotive, fleet and off-road. Parent oversees management of all functional areas from product development to marketing/sales/business development to operations and administration. Over the past year, he led the company transition from a retail, B2C consumer electronics business to a software/solutions focused B2B business.



This screen captures how Magellan's Return to Route can help drivers work around construction and get back on route in a efficient manner. (Photo provided)

Ark Encounter

Williamstown, Ky.



The replica of Noah's ark stretches almost two football fields in length and towers seven stories above the ground.

by RAY BALOGH | The Municipal

(Photos provided by Answers in Genesis)

Atop one of the scenic rolling hills of Williamstown, Ky., population 3,931, rests a boat — a really big boat.



Hailed as the world's largest timber-frame building, the life-size replica of Noah's ark towers seven stories above the ground and measures 510 feet long and 85 feet wide.

The brainchild of Answers in Genesis, a Christian apologetics ministry that also built the Creation Museum 45 minutes to the northwest, the ark serves as the centerpiece of Ark Encounter, America's newest theme park, which opened in 2016.

The 800-acre complex also features a petting zoo with animals from around the world; 22 zip lines; Emzara's Kitchen, a 1,500-seat, two-story casual dining venue, "perhaps America's largest restaurant," according to www.answersingenesis.org; and a variety of eateries dishing up barbecued items, sandwiches, baked goods, ice cream, flavored

popcorn and other treats. Ark Encounter recently added a 2,500-seat performing arts theater.

Attractions planned for the future include a walled city, first-century Middle Eastern village and marketplace, Tower of Babel and a walk-through aviary.

The park, located 40 miles due south of downtown Cincinnati, welcomed more than 2 million visitors in its first two years of operation.

Ark Encounter is not without controversy. In fact, its history is a chronicle of grappling with opponents and addressing misconceptions.

- On Dec. 1, 2010, Answers in Genesis and the nonprofit Ark Encounter LLC announced their plans to build the theme park. They researched possible sites in several Midwestern states and selected Kentucky because of its economic development incentives.
- Shortly thereafter, Kentucky Gov. Steve Beshear issued a press release embracing

The ark is the largest timber-frame structure in the world. Some of the supporting beams measure 10 feet in diameter.



In one of several dioramas in the ark, Noah records an entry in his captain's log as his wife reads a parchment.



The ark contains 132 bays, many of which enclose likenesses of animal "kinds" thought to accompany Noah and his family. Answers in Genesis contends only about 7,000 animals were housed in the ark during the flood, from which the world's current species have proliferated.


the project, citing a feasibility study concluding the park would employ 900 people and deliver an economic impact of \$4.3 billion in its first 10 years of operation.

- Williamstown designated a 1 1/4-mile radius around the site as a tax increment financing district, returning 75 percent of the district's sales and property taxes to Ark Encounter for 30 years, a move unsuccessfully challenged by some as a violation of separation of church and state.
- In December 2013, Williamstown offered \$62 million in unrated bonds to help finance construction. Bond sales were somewhat lackluster until the airing of a Feb. 4, 2014, debate between Answers in Genesis founder Ken Ham and Bill Nye "The Science Guy." The debate ignited bond sales and donations and three weeks later Ham announced enough funds were raised to begin construction. Groundbreaking was scheduled for May 2014.
- In July 2014 Ark Encounter applied for tax incentives with the state. The Kentucky Tourism Development Finance Authority's performance-based incentive program allows qualified tourism projects to recover 25 percent of sales tax paid by visitors for tickets, food and souvenirs. The application was rejected in December 2014 for alleged discriminatory hiring practices because Ark Encounter required employees to sign a statement of faith.
- Answers in Genesis filed a federal action on Feb. 5, 2015, challenging the rejection as an unconstitutional violation of its religious freedom. In January 2016, the court ruled in favor of Answers in Genesis, stating the organization was permitted to give employment preference to persons adhering to its central tenets. The court also decided Ark Encounter met the legitimate

secular public purpose of spurring tourism and thus qualified for the incentive.

- Ark Encounter posted a rebuttal to the claim of unconstitutionality in the FAQ section of www.arkencounter.com: "No taxpayer dollars were being applied for in building the Ark.... The incentive pertains to sales tax collected at the finished Ark.... Thus, no unwilling taxpayers have seen their tax dollars used to build the Ark."
- Ark Encounter held a ribbon-cutting ceremony July 5, 2016, and opened to the public two days later. About 150 members of Tri-State Freethinkers gathered near the highway exit to protest the opening. Eric Hovind, founder and president of Creation Today, launched a counter protest and offered to pay admission fees for any opponent wishing to tour the ark. The gesture was accepted by 21 of the freethinkers.
- Ham invited Nye on one of the Ark's first tours, and they held an informal debate as they toured the structure. Nye called the displays "very troubling" and opined about school kids being "indoctrinated" and "brainwashed."
- The Freedom From Religion Foundation mailed more than 1,000 public school districts in five states, urging them not to organize field trips to Ark Encounter. Ham responded by offering public school groups a \$1 admission per child and no charge for accompanying teachers throughout 2016.
- In April 2017, Williamstown implemented a 50-cent-per-ticket safety assessment on several tourist attractions within city limits to help fund upgrade of the city's emergency equipment. Ark Encounter pays more than 90 percent of the total assessment collected.

Williamstown touts itself as "Home of the Ark Encounter" on the homepage of its website, www.wtownky.org.

"The dynamics of this worldwide attraction is quickly changing Williamstown from being a bedroom community to a vacation hub," says the website. "Hotels and restaurants are developing at both of our Interstate 75 exits and you will find that downtown still offers the quaintness of a small town." 



Ark Encounter drew more than 2 million visitors in its first two years, an average of nearly 3,000 people per day.

Eureka, Calif.



Eureka, Calif., population 27,177, is the only municipality in the nation to adopt the state's seal as its own.

Befitting, perhaps, because the city bears the name of California's motto: "Eureka"—the Greek word meaning, "I found it."

The state seal, adopted in 1849, bears the likeness of the Roman goddess Minerva—Athena in Greek mythology—the goddess of war and wisdom. Her image was chosen because by legend she sprang full-grown from Jupiter's brain, much as California became a state "without having gone through the probation of a territory."

At her feet crouches a grizzly bear munching on grape vines and a sheaf of wheat, emblematic of the fauna and agriculture of the area.

A gold miner can be seen swinging a pickax. Next to him lie a shovel and rocker box, which was used to sift fine gold particles from valueless detritus.

Ships sail the harbor against a backdrop of the Sierra Nevada.

Arched around the top of the round seal are 31 stars, symbolizing California's rank as the 31st state admitted to the union.

Eureka is situated on Humboldt Bay, the state's second largest bay and the largest deepwater port along a 500-mile stretch of California's Pacific coast.

The settlement of Eureka, founded May 13, 1850, was noted for its lumber industry, gold mining and prolific commercial fishing.

Its first post office opened in 1853.

Many of its first inhabitants were lumbermen, and Eureka boasted seven of the nine mills initially operating on Humboldt Bay, earning the town the designation of "Timber Capital of California."


By the time its charter was granted in 1856, Eureka processed 220,000 board feet of lumber every day.

Commercial fishing was another economic mainstay for Eureka. Salmon, tuna, Dungeness crab and shrimp were popular catches and the annual total landings peaked at 36.9 million pounds in 1981.

Timber continues to serve as a major industry in Eureka, but mining and fishing have been replaced by tourism, healthcare and services.

But the aesthetics of bygone days has been carefully preserved and the entire city is designated a state historic landmark.

Old Town Eureka, the original downtown area, has been restored into a vibrant arts center. Old Town, containing more than 150 buildings, has been declared a historical district by the National Register of Historic Places.

U.S. 101, which skirts Eureka's western and northern borders, connects the city to the Oregon state line 100 miles to the north and San Francisco 250 miles south. 



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Focus on: Technology

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The amount of money each year U.S. motorists pay, on average, in order to repair vehicles from potholes and other road conditions.

Learn about how Purdue University and West Lafayette, Ind., are partnering together on developing a pothole detection device using an Xbox Kinect on page 22.



1,600

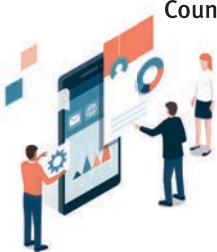
The number of privately owned vehicles that will be equipped with connective technology as part of the U.S. Department of Transportation's Tampa Connected Vehicle Pilot, which is occurring in Florida.

Read more on page 18.



\$3.2 Million

The estimated annual savings that Mecklenburg County, N.C., is seeing as a result of using digital workspace solutions that offer mobile access; these solutions have increased productivity.



Source: <https://stateechmagazine.com/article/2018/09/mobility-empowers-better-government-services-and-happier-users>

4 Miles

The city of New Orleans is utilizing a smartphone app that will allow users to tour sites involved in the slave trade during the 18th and 19th centuries. Affiliated with New Orleans's tricentennial celebrations, this high-tech tour will cover nearly 4 miles, including more than a mile of backtracking. A map navigation button can be used to find nearby sites.



Source: www.pressofatlanticcity.com/business/technology/new-orleans-publicly-unveiling-slave-market-tour-app/article_fc7a2ad-300a-55e4-b13f-599495c333f3.html

66%

The percentage of cities reporting that they are investing in smart city technology and 25 percent of those without any smart city systems are exploring how to implement it, according to a 2017 National League of Cities report.



Source: www.nlc.org/resource/cities-and-innovation-economy-perceptions-of-local-leaders

350 Miles

The city of Savannah, Ga., assessed half of its roadways — or 350 miles out of 700 miles — using an iPhone. The city contracted the company "Roadbotics" over the summer of 2018, which uses the smartphone to collect data that is then translated as an assessment into a map.



Source: www.wtoc.com/2018/09/27/new-technology-successfully-assessed-half-city-savannah-roadways/



As pedestrians cross East Twiggs Street using the mid-block crosswalk at the Hillsborough County Courthouse, approaching drivers whose cars are equipped with CV technology will receive an alert that a pedestrian is in their path. (Photo provided)



Connected Hillsborough Area Regional Transit buses on certain downtown routes will communicate with traffic signals to request priority so they can stay on schedule. (Photo provided)

DOT's connected vehicle pilots look to safer roadways

By SARAH WRIGHT | The Municipal

FROM A WINDY INTERSTATE HIGHWAY out West to more crowded urban centers in the East, the United States Department of Transportation is putting connected vehicles through their paces with its Connected Vehicle Pilot Deployment Program. During the course of the pilot, the three sites — Interstate 80 in Wyoming, Tampa Hillsborough Expressway Authority in Florida and New York City — will be collecting data on how connected vehicle technology can benefit American roadways, including saving lives, improving personal mobility, enhancing economic productivity, reducing environmental impacts and transforming public agency operations.

The Tampa CV Pilot launched in 2015 after the DOT awarded the Tampa Hillsborough Expressway Authority, or THEA, a \$17 million contract. Since then, the pilot has become a partnership between several organizations.

The implementation team includes HNTB, Siemens, the University of South Florida Center for Urban Transportation Research, Brandmotion and Global-5 Communications while other key partners are the Florida Department of Transportation, the city of Tampa, the Hillsborough Area Regional Transit Authority and Hillsborough Community College.

The Tampa CV Pilot has gone through design and testing, working toward the third and final phase — deployment and data collection.

“We have technically moved into phase three,” Bob Frey, program manager of the Tampa CV Pilot, said, noting in this phase they will start generating data and upload it for research purposes. “By Dec. 31, we will be getting the infrastructure in place and in the vehicles.”

Tampa CV Pilot will equip 1,600 privately owned vehicles, 10 buses and 10

streetcars with the onboard units. Outside of the vehicles, there will also be 46 roadside units, developed by Siemens, in the testing area — these will communicate not only with the connected vehicles but also with the city’s transportation management center, using dedicated short-range communications, or DSRC. Meanwhile for the vehicles, system integration partner, Brandmotion, has worked with Savari, Commsignia and SiriusXM to supply the units. These units display safety messages on an enhanced rearview mirror. Vehicles are also outfitted with antennas and other equipment, like a short-range radio, designed to connect to other vehicles and infrastructure.

The enhanced rearview mirror option was selected largely due to cost — according to Frey, the mirrors are consumer grade rather than some of the auto-grade options considered. “With 1,600 automobiles,” he said, “... this was more cost effective.”



Drivers of connected vehicles on the Lee Roy Selmon Expressway's Reversible Express Lanes will receive an alert when traffic is backed up ahead. This warns the driver to slow down to a recommended speed as the vehicle approaches the end of a queue. (Photo provided)



Pictured is the short-range radio unit that will be installed in the driver's truck or rear storage compartment. About the size of a paperback book, this equipment communicates with other CVs and devices. (Photo provided)

As to whether the mirror might be a distraction, Frey said, "We will find out." He noted drivers will be trained to use the mirrors and policy decisions could be made later. "Somethings work, somethings are not mature enough to work."

In the pilot program, the mirrors will warn connected drivers if another connected car has suddenly slowed or come to a stop in front of them; if they are approaching a curve at an unsafe speed; if they have become a wrong-way driver; if a pedestrian is in the crosswalk; and if it is unsafe to enter an intersection. For public transportation drivers, connectivity will also prove beneficial. Connected buses will be able to communicate with traffic signals on their routes, which will then prioritize bus movements when necessary, keeping them on schedule. For streetcars, connectivity will

Roadside units installed along the Lee Roy Selmon Expressway's Reversible Express Lanes will determine if the driver of a connected vehicle is approaching the downtown end at an unsafe speed. The RSUs will send a message to the vehicle and recommend a safe speed based on the length of the queue ahead. RSUs also will be installed at select downtown intersections to alert connected vehicle drivers, buses and streetcars to the presence of pedestrians at crosswalks. (Photo provided)



alert operators when a connected vehicle is about to cross the track, reducing the risk of a collision.

Pedestrians will also benefit from the pilot at East Twiggs Street, where sensors will be placed to detect a pedestrian in the crosswalk. Roadside equipment will then broadcast that information to CVs in the vicinity.

"Our project uses LIDAR (light detection and ranging)," Frey said. "Originally we tried to use cellphones, but the GPS in cellphones was not accurate enough. So we will be using LIDAR until the technology catches up and until we can use smartphones."

Much of the pilot requires drivers to step up and volunteer; otherwise, enough data could not be gathered. To entice volunteers to have the equipment installed in their private vehicles, THEA offered a savings of up to \$550 on tolls. All volunteers needed to do was complete an eligibility questionnaire.

While much has been made about autonomous vehicles and their rollout across the country, Frey stressed such vehicles are not automatically connected; however, connectivity and autonomous could be paired in beneficial ways, resulting in the collection of more data. "If they are not going to connect, it doesn't help the (transportation) system," he said. "I see these two technologies intersecting."

For municipalities watching these CV pilots, Frey said, "The roadside infrastructure is there. There are actions they can take to step toward (connectivity). With traffic signals get the next generation that are ready to receive connected vehicles coming in. There are steps they can take to move forward."


This also includes adding connectivity to public transportation systems, or even testing out autonomous features like Tampa and nearby St. Petersburg have. ►

The Tampa CV Pilot will wrap up sometime in April 2020; however, Frey noted, “As long as data is coming in, we are going to continue to make that available.”

And with that sizable cache of data, Frey hopes the programs will spur the growth of connected vehicles, noting researchers involved in the program think in the long run connectivity in transportation will be a good thing.

“Actually what we are doing is the entryway to smart cities,” Frey said. “Set up infrastructure for connective vehicles and then build off that to other areas. It’s a entry-level technology.

“We’re all hoping this technology shows that we can solve (transportation problems) with a manage infrastructure approach rather than just adding another lane,” Frey added, noting the technology even shows the potential to accommodate future vehicle flow.

“It’s another tool in the toolbox, something looking forward,” he said. “You can use what you already have at an intersection, bring technology into the system — the opportunity is there.” 



On the Web

Visit www.tampacvpilot.com to read more about the Tampa CV Pilot and www.its.dot.gov/pilots/ for an overview on the overall Connected Vehicle Pilot Deployment Program.

The downtown terminus of the Lee Roy Selmon Expressway Reversible Express Lanes is a potential entry point for wrong-way drivers. The Tampa Connected Vehicle Pilot will detect and warn wrong-way drivers before they get on the expressway. Other drivers on the REL will also receive a warning if a wrong-way driver is approaching. (Photo provided)

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By **NICHOLETTE CARLSON** | The Municipal

Any municipality that experiences harsh winters has at least one common enemy—potholes. Purdue University is working with West Lafayette to help identify this problem.

“Potholes are a very significant issue in many municipalities, particularly in West Lafayette Ind., because we have a harsh winter,” Mohammad R. Jahanshahi, the Purdue University assistant professor working on the project, stated.

One-third of the roads are in mediocre condition, and the poor condition of the roads is responsible for approximately one-third of traffic fatalities. Each year U.S. motorists pay, on average, \$67 billion in vehicle repairs from potholes and road conditions.

Pothole detection methods

Currently there have only been limited options for cities regarding pothole detection. Individual drivers are able to report potholes. The most common method is a manual, visual inspection by professionals; however, this can be subjective, inefficient and time consuming. A van with high-resolution systems and sensors can be purchased to do the job. However, the vans are extremely expensive and still lack full automation.

With continuing advances in sensor technology and data analysis, Purdue University decided to attempt to develop a cost-effective pothole detection system that could be put on multiple vehicles. This would make the collection of data more efficient. The challenges would be finding inexpensive hardware that could be connected to a system that would be able to handle such large amounts of data.

Jahanshahi had previously published papers on using an Xbox Kinect for such purposes. Since they are mass produced for gaming systems, they are reasonably priced. They are also able to judge distance and color similarly to a camera. “Kinect is a motion tracking sensor. A device that connects to an Xbox game console that tracks your motions basically,” he explained.

For pothole detection, the Purdue University EPICS group began the project by using “it as a device to scan the road surface, and when you have potholes, there would be a depression. So if we would develop algorithms to identify dual depressions, we could be able to detect and quantify potholes,” Jahanshahi illustrated. The Kinect

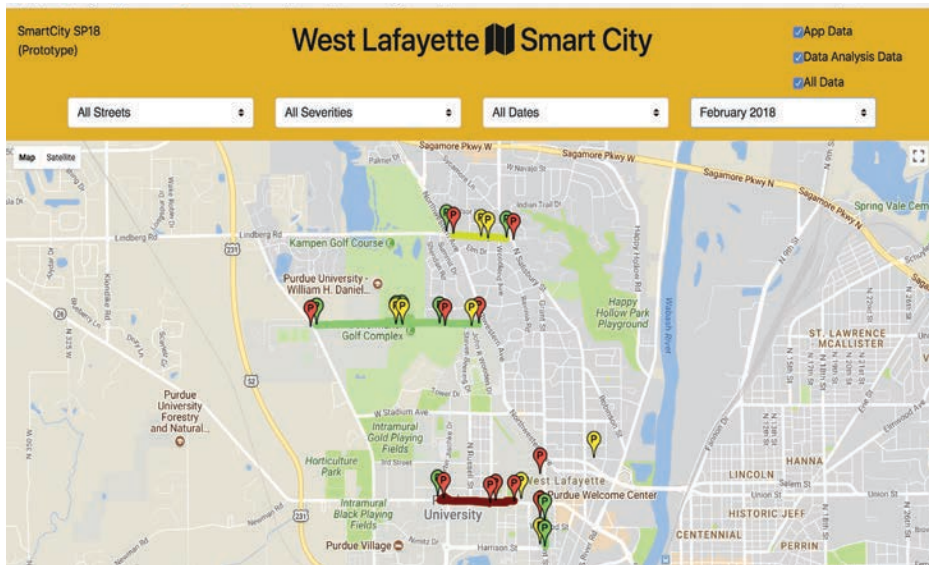
would then connect with a GPS so that the location and severity of each pothole could be easily identified.

Issues and updates

Having worked on this project for three semesters, the group has encountered some issues, including difficulty with synchronization. Jahanshahi described the workaround as “students looking at different microprocessors to see which one is compatible with Kinect.” Another challenge was coverage, with students soon discovering that more than one Kinect may be needed on the vehicle to capture an entire lane.

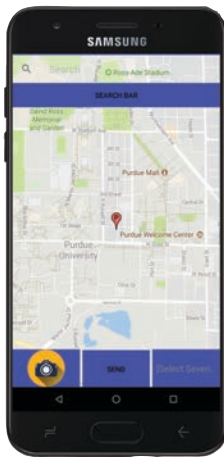
Since Kinect’s use of infrared was made for indoor use, EPICS discovered that direct sunlight would interfere and distort the data. “Students were working to put together a system that can provide shade for the prototype because Kinect was made for indoors,” Jahanshahi said. “They would make sure there wouldn’t be any interference from sunlight.”

This work led to the design and creation of a box that would be able to block sunlight and provide a connection between the sensor system and the car. This method was first tested indoors with artificial potholes made from cardboard to determine the Kinect’s ability to measure depth. The box system was then able to be placed on



LEFT: Pictured is a prototype of the website that the EPICS group is working on for the city of West Lafayette. The website would use the Kinect sensor technology to detect potholes, and the website would be able to show users where potholes are located along with the severity of the pothole. (Photo provided)

After splitting up the duties with Vertically Integrated Projects, an electrical engineering group, the EPICS team is focusing more on creating a phone app that will allow users to identify where a pothole is located. The app will use the phone's GPS for a more precise location. (Photo provided)



second. Therefore, the depth information on the potholes is determined by the distance between each pixel and the sensor.

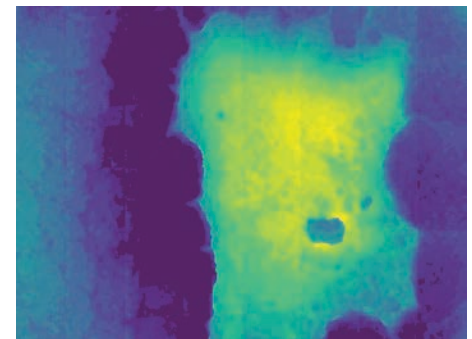
Dividing up the work

After those three semesters, students decided to split up the work between two Purdue University groups—EPICS and Vertically Integrated Projects, an electrical engineering group. V.I.P. will focus on work with the pothole detection hardware and software. Several sensors and processing units have been tested so they hope to use the new sensor to improve data analysis and optimize data collection this semester.

EPICS students will focus their work on developing and updating a phone app using GPS for citizens to take pictures of potholes, which will send the information to servers that the city will be able to access. Jahanshahi considered this a more efficient reporting method since it can be done quickly and will include both photos and a more precise the location. They have also been asked to include more features, such as the ability to report other city issues like a street light being out.

"The ultimate goal is to have the system being tested for actual applications," he continued. However, he admitted it will be a few more semesters before it is ready for use. The initial testing will be done on the students' vehicles.

As part of their midterm review, students invited West Lafayette city officials to hear presentations on their project ideas and ask questions. In order to better meet the needs of the city, they worked with a city engineer, Marcus Smith. Eventually, the long-term



ABOVE and BELOW: These images show what a pothole will look like on the system when detected. In the raw data, the green and yellow shows a pothole on a road. In the system, the pothole is shown by the white area. (Photo provided)



the back of a car to collect data. Testing was successful and there is currently a patent for the system.

Students have also looked into the design of garbage trucks to identify a location on the truck that would provide shade. "For the city of West Lafayette, the idea was to use this system on garbage trucks for the first phase, and once it is successful, we would be able to put this system on vehicles," Jahanshahi said. Placed on vehicles, the data collection would be similar to crowdsourcing pothole information.

A newer version of Kinect has also been chosen for better data collection with its higher resolution and better quality. It is able to capture videos at 60 frames per

goal is to expand this idea to other cities and even to the Indiana Department of Transportation.

"The objective here is to first make sure we can collect data and process it and get the results that we want in collaboration with the city of West Lafayette at lower speeds," Jahanshahi clarified. "Once it is successful and long term, we want to integrate this system and work with INDOT so that we will be able to evaluate the surface of highways and roadways." Once students reach this level, the greatest problem will be finding a way to deal with the large amounts of data that will come in. **M**



Microgrids harness resilient, local energy

By ANDREW MENTOCK | The Municipal

Thanks to Hurricane Florence, the coastal areas in the Carolinas and surrounding states spent a significant amount of time underwater and without modern resources such as heat, gas and electricity.

This includes fairly populated cities such as Wilmington, N.C., where most homes and businesses went without power for several days. But for as disastrous as this tropical storm was, an innovative power grid structure could have helped power in Wilmington return quicker, possibly saving lives.

This innovative system is known as microgrids, which are proving to be a reliable and resilient way to locally produce energy, especially when they are interconnected throughout a metropolitan area.

"If places like Wilmington, N.C., had been set up like a microgrid, they would have their own energy resources right there — in the town, in the city, maybe right on the outskirts — that maybe they could have gotten up and running (quickly) and get that infrastructure electrified and operating much, much quicker than it would take otherwise," said Dr. Gregory Reed, the head of the energy program at the University of



In times of disaster, microgrids could mean faster restoration of power as work could be completed by local workers rather than waiting for workers from around the state to be coordinated. Pictured is damage from Hurricane Florence in Wilmington, N.C. (MicheleMidnight/Shutterstock.com)

Pittsburgh's engineering school, who also is starting to develop a grid of microgrids within the Pennsylvania city.

He said that, traditionally, power grids have provided electricity throughout a city or region, meaning that the power comes from one large centralized resource, such as a robust nuclear plant, hydro dam



ABOVE: Known as the City of Bridges, Pittsburgh, Pa., is also gaining a reputation for its microgrid, of which its city government and mayor are very supportive. Microgrids' sustainability and reliability were a major plus for the city. (Shutterstock.com)



LEFT: Microgrids use localized electricity sources — like solar power — rather than being solely dependent on a regional energy sources. (Shutterstock.com)

facilities, large coal or natural gas plants or even wind farms. The energy is then transported from that location via a high-voltage transition system throughout a region.

That is why when the power went out in Wilmington, turning it back on was largely out of individual resident's hands. They were stuck waiting for workers from around the state to come and fix their power problem. If the city had used microgrids, it could have taken matters into its own hands.

"They would still have the physical damage to deal with, but they wouldn't be relying on all the coordination of remote resources," Reed said. "It makes it a lot quicker. It would make places like hospitals — places of refuge — would be public arenas, (and) things like that where you would probably in a typical microgrid design have a lot of long-term, backup emergency resource capabilities."

For as much as a grid of microgrids could have helped coastal cities like Wilmington, Pittsburgh is largely unaffected by large scale natural disasters like Hurricane Florence. So

why are they the world leader in this innovative piece of technology? It is because it is more environmentally stable and reliable for the future.

"A lot of communities — a lot of businesses — are all looking to move into a more sustainable future and are able to implement solar and other sustainable solutions locally; they have control over (it), (which) is sort of accelerating the growth of renewables," Reed said.

This works because it is much more cost effective to utilize sustainable resources on a smaller scale than compared to a large solar plant or wind farm. With microgrids, which might power a single facility or a major city block, a series of solar panels can go a long way.

"It could be a commercial business park, it could be like a shopping mall, it could be a university campus, it could be a neighborhood, it could be an industrial park," Reed said. "It's any defined geographic and end-user facilities that if they had their own resources on site, (they) could supply

their demand and set it up in a way that they (produce power) continuously while still being tied to the larger grid."

Implementing a microgrid can be somewhat expensive, so it takes a significant commitment from local businesses, politicians and engineers to successfully launch such a system. Luckily for Reed, that is exactly what he has in Pittsburgh.

For instance, Bill Peduto, the mayor of Pittsburgh, has been very supportive, even given the high price.

Reed said that costs to build microgrids and connect them are probably going to be "uncompetitive" until the technologies continue to advance and become more affordable.

Currently, Reed is almost finished with building a new, high-voltage laboratory at the university near downtown Pittsburgh, which is basically its own microgrid. This will expand his research capabilities and infrastructure.

"Right now, you have a lot more control of how sustainable you want to make your resource mix," he said. "That is if you're doing it on your own in a microgrid environment." **M**

The most populous city in the state of South Dakota, Sioux Falls guides smaller cities in many ways. It is also developing a diverse tech base. (Shutterstock.com)



Sioux Falls, S.D., looks to tech companies for best practices

By LAUREN CAGGIANO | The Municipal

Sioux Falls, S.D., recently introduced a department of innovation and technology. And if you ask the mayor, this move is a nod to the direction cities of its size or larger are going or should be going.

According to Mayor Paul TenHaken, Sioux Falls has a population of about 185,000, which means its population accounts for a quarter of the state. In many ways, Sioux Falls is the epicenter of South Dakota and, therefore, the rest of the state looks up to it in a lot of ways. It has a diverse but growing tech base.

TenHaken was conscious of these factors when he took office in May. A former tech entrepreneur himself, he said he wanted

to “bring technology and innovation to the table.”

That means adopting a similar mentality embraced by the private sector to government. “It means leaning into risk, instead of eschewing it.”

“I’m the guy who wants to experience failure and try new things,” TenHaken said. “I wanted to bring (that attitude) to the table.”

To that end, he has reorganized existing departments — information technology,



Sioux Falls, S.D., Mayor Paul TenHaken



By having one central office for technology and innovation, Sioux Falls aims to use data to better serve stakeholders. Citizens have given positive feedback, understanding the importance of technology. (Shutterstock.com)

geographic information systems and communications — to form one central office focused on supporting the city’s technology and innovation needs.

In his words, its purpose is to look at new and innovative ways to solve existing problems. As he points out, basic government services like policing and water treatment rely on daily data gathering and analysis. Although it remains largely behind the scenes, he noted, “The cornerstone is technology.”

Infrastructure may be the foundation, but the people are what push these initiatives forward. TenHaken said personnel come from a variety of professional backgrounds, but they are coming together to use data to better serve stakeholders.

At the helm is Jason Reisdorfer, who has been tapped to serve as director of innovation and technology. According to a statement from the city, Reisdorfer is a Sioux Falls native and attended Augustana University. In 2012, Jason sold his restaurant business to go work with his long-time friend Eric Weisser. Together, they built Weisser Distributing into one of the fastest growing companies in South Dakota. They recently earned their fourth consecutive selection to the Inc. 5000 list of fastest growing private companies in the United States. As the director of operations, Reisdorfer led Weisser Distributing’s growth from four employees and \$1 million in sales to over 130 employees with warehouses in three cities and are on pace to record over \$65 million sales in 2018.

While innovative by South Dakota standards, TenHaken noted that the creation of this department mirrors what mayors are doing in other cities nationwide. For example, the city of Durham, N.C., has

been on his radar. According to Durham’s website, its efforts have caught the attention of a high-profile organization:

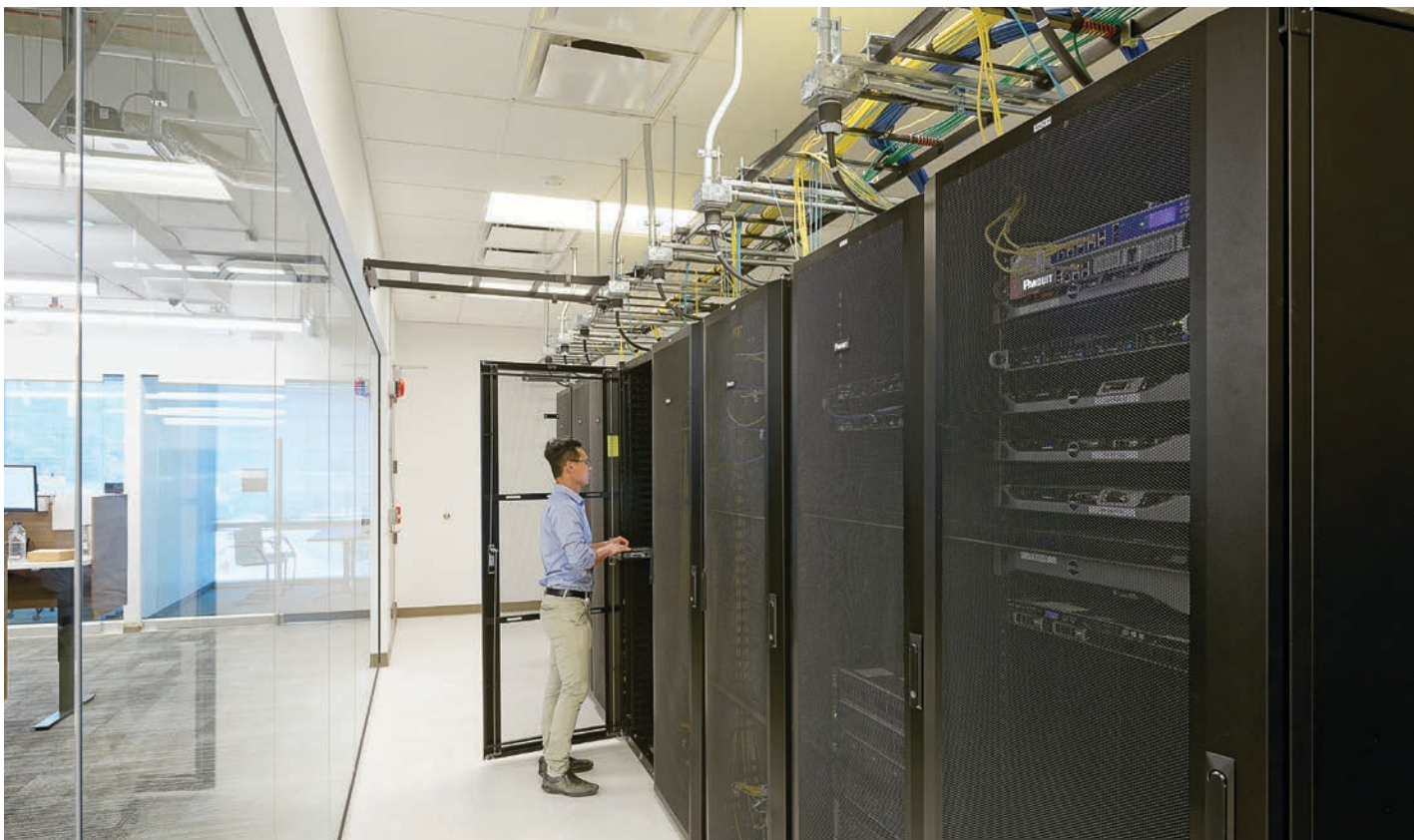
“In January, Bloomberg Philanthropies recognized the City of Durham as a new member of its Innovation Teams Program, which helps cities solve problems in new ways to deliver better results for residents. Durham was selected from a pool of municipalities with a demonstrated commitment to creating solutions to complex problems through innovation. The city received a \$1.2 million, three-year grant from the foundation to help support the i-team, which now has four employees who will offer the city a different set of tools and techniques to innovate more effectively, and work with residents and community stakeholders to solve pressing problems. The first challenge, identified by former Mayor William V. ‘Bill’ Bell, is to increase economic opportunity for Durham residents who are justice-involved or at high risk of justice involvement.”

Speaking of residents, TenHaken said the feedback from residents has been positive because they seem to understand the importance and role of technology in our ever-changing society.

As for other municipalities wanting to follow suit, TenHaken offered some advice: “For other cities who want to roll out (an innovation and technology initiative), the walk has to match the talk.”

Related to that, he addressed the importance of buy in from employees. It has to start at the top, he said, and be infiltrated down through the ranks as part of the city’s strategic plan and values.

“It is my opinion that when a city gets to be our size (or larger), then (it) is ripe for a focus on innovation,” he said. “The city has to be at the right (point in its) life cycle.” ^M



Keeping on track with technology

ABOVE: A Sandy Springs, Ga., IT staff member visits the server room. Sandy Springs outsources its IT work but the staff works onsite. (Photo provided)

By **DENISE FEDOROW** | The Municipal

Trying to keep up with technology these days can be a full-time job for anyone, and municipalities, in particular, have so many factors to consider, including the different technology needs for various city operations, how often that technology needs updated and how to pay for it all.

When we use the term “technology,” certain images or functions might come to mind, but really every department uses technology from basic laptops and smartphones to more complex enterprise resource systems, customer relationship management systems or geographic information systems. Fortunately, there are several different avenues available to municipalities to help, including cooperative purchasing, private-public partnerships, outsourcing IT needs, grants and other creative solutions.

Duff Erholtz, membership development administrator for Sourcewell — previously NJPA — in Staples, Minn., spoke about how

cooperative purchasing helps speed up the purchasing timeframe as well as reducing procurement costs.

“The use of cooperative contracts streamlines the process to maintain continuity in existing systems, allows quicker access to needed products and can allow all city employees/departments access to a proven provider (CDW, SHI, GovTech, etc.) for smaller purchases necessary to ensure workflow,” Erholtz said.

“Cooperative contracts also allow expertise to be factored into the purchasing decision — (especially with) brand preference or dealer preference. The knowledge and expertise provided are more important than the actual security or technology hardware. Utilizing a

cooperative contract can allow a municipality to ‘choose’ a proven and trusted provider and still be compliant with its mandated procurement codes and policies,” Erholtz added.

The use of cooperative contracts gives cities better pricing by leveraging national volume and also allows access to expertise that may not be available otherwise in structuring the solicitation of the contract and evaluating the contract.

Increasingly, communities are partnering with private companies or organizations for the benefit of each other. AT&T has been reaching out to cities across the country to help bring in 5G technology. In news releases this past July, the company announced plans to introduce mobile 5G to the cities of Raleigh, N.C.; Charlotte, N.C.; and Oklahoma City, Okla. They will be joining Dallas, Texas; Waco, Texas; and Atlanta, Ga. These news releases also noted that AT&T is deliberately launching this to a mix of big and mid-sized cities.

Melissa Arnoldi, president of AT&T Technology & Operations, said in that release, “We’re on track to launch the first mobile 5G services and deliver the first device to customers this year. 5G will be more than just a better network.”

She added that after the trials conducted with large, mid-sized and small businesses over the past two years, “We believe 5G will ultimately create a world of new economic opportunities, greater mobility and smarter connectivity for individuals, businesses and security as a whole.”

This 5G technology will reportedly allow for new experiences like virtual reality, telemedicine, self-driving cars, robotics, smart cities and more. The Internet of Things technology will be better with 5G, and some applications for cities include simply retrofitting existing streetlights with sensors that can help monitor traffic and road conditions, reduce crime and help first responders.

Sandy Springs, Ga.

The city of Sandy Springs incorporated in 2005 operates as a public-private partnership city with nearly half of the city’s employees employed by private companies. General city services, including public works, community development, IT, finance, courts, communications, parks and recreation, economic development and call center operations, are all carried out with the help of private contractors.

According to Sharon Kraun, communications director for the city of Sandy Springs, the contracts are on a five-year cycle with annual reviews of task orders.

Jonathan Crowe, IT director, said this enables the city to “attract better employees who are more eager” while allowing them more freedom as well. The entire department is contracted labor, but they are full-time employees working on site who are dedicated to the city.

When it comes to outsourcing, that’s a piece of advice that Jason Green, a member of the city’s smart cities committee, offered, “Outsource to a company or organization that’s going to give you in-house employees.” He added that’s a flexible model and employees working in-house “better understand your needs.”

Formed about a year ago, the smart city committee is comprised of about 10 people from various city departments. “Not necessarily department heads,” Green said, “but several middle-of-the-road or technology-minded individuals” who meet monthly to collaborate on city’s challenges and how to solve them.



Sourcewell helps government agencies, educational institutions and nonprofit organizations work more efficiently by providing cooperative purchasing agreements and other benefits. (Photo provided)



An employee at Sourcewell, located in Staples, Minn., is busy at work. Sourcewell helps to bring organizations together in cooperative purchasing agreements. (Photo provided)

Green said, “One of the key challenges is coordinating technology between different departments or different silos.”

The goal is that everybody in every silo is aware of any initiatives so they are able to bring expertise to the decision-making process. In other words, Green said, if one department is “searching for tech solutions and is vetting a product, that they’re not duplicating efforts (happening in another department).”

Crowe agreed saying that having the committee makes for “better inter-department communication.” ▶

One of the recent projects that the smart city committee undertook was a unified platform. With all the city's different electronic systems, public communications, websites and social media accounts, staff members were spending a lot of time posting in all the different places. With the unified platform, they can create content in one place and it goes out to all those different avenues at once.

Green said committee members knew they wouldn't be able to go to one vendor and get an out-of-box product — they knew they'd have to customize it to the city's needs. Rather than totally reinventing the wheel, the city got a single content management platform from Drupal and heavily customized it to meet needs. Now when employees create content, it goes every platform at once — to all four of the city's digital signs, all the widgets, social media, etc.

"Being able to post content in one place and automatically be able to display it on all the signage, etc. was big for us," he said.

If there are any negatives to this, Crowe said, "Sometimes there are so many options it's hard to get a grip."

But if that happens, it goes through the chain of command for the department and "to the city manager who makes the ultimate decisions for the city," said Green.



Sandy Springs, Ga.'s, new performing arts center has a digital sign on the outside, which requires city employees to update it; this is done automatically with the city's unified platform. (Photo provided)

Other advice that Green offered was to "invest in people who understand technology."

When it comes to smart cities, Crowe cautioned, "Don't invest in technology for the sake of technology — identify your needs and make sure you're getting the right solution."

Kraun couldn't agree more. "We get pitched technology on a daily basis, but sometimes the old-fashioned way of doing things is still best."

When it comes to making your city a smarter city, it's best to focus on what works best for you and your residents while finding the most efficient and cost-effective way to implement it. **M**

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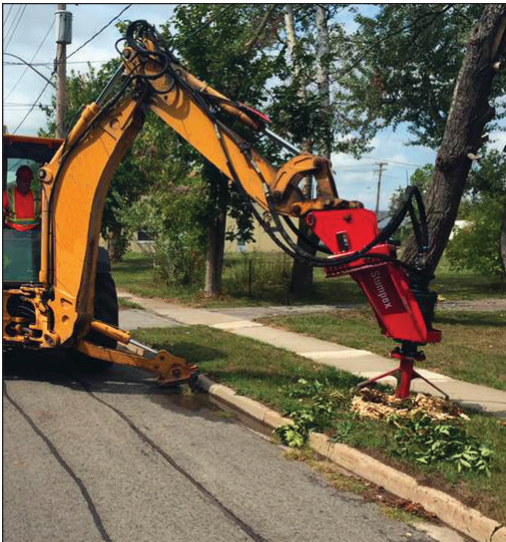
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Eclectic mix makes Missoula great place to live

By CATEY TRAYLOR | The Municipal

If you haven't ever been to Missoula, Mont., you might want to pay the city and its 66,000 residents a visit. After all, it's one of the American Planning Association's five Great Neighborhoods of 2017.

A decade ago, the APA launched the Great Places in America initiative as a way to recognize unique and exemplary streets, neighborhoods and public spaces — three essential components of all communities.

Each year, there are five designees in each category, and judging criteria includes the presence of affordable transportation options, the promotion of community involvement and accessibility and thriving economic opportunity. In addition, architectural features, accessibility, functionality and community involvement are taken into

consideration. There are 275 Great Places designated to date, and they are located in all 50 states and the District of Columbia.

"Our Great Places in America designees highlight the many facets that make up planning — from community engagement, quality of character and economic development," said Cynthia Bowen, AICP, president of APA in a news release about the 2017 designees. "These neighborhoods, streets and public spaces illustrate how a community coming together creates lasting value."

The Heart of Missoula — the city's main downtown corridor — placed in the Great Neighborhoods category due to being a "thriving, vibrant center of the city and an outstanding destination for the Rocky Mountain West."

Situated as a pitstop between Glacier National Park and Yellowstone, Missoula touts an eclectic mix of longtime residents, university students, artists, musicians and tourists passing through. The city has capitalized on its natural elements and unique location to wow residents and visitors alike.

"Our city is very much a mix with the amenities of a large city, but the feel of a small community," Laval Means, Missoula Planning Services manager, said. "Missoula is the only designated city in the county so

LEFT: With the Clark Fork River passing through it, Missoula, Mont., offers scenic views and plenty of recreational opportunities. (Photo by Adam Stensrud)

RIGHT: The only designated city in Missoula County, the city of Missoula maintains a small-town feel while offering residents and visitors varied big-city amenities. (Photo by Mark Mesenko)

there's a regional draw for shopping malls, cultural activities and health care here, but it's still small enough to have that community flare, care and connection."

One of the city's defining features is the Clark Fork River, which runs clear through the Heart of Missoula. A number of parks and attractions are located riverside, and Means said the community really embraces its location.

"People really cherish our river," she said. "We've really enhanced the park system along the river, specifically one really large park that sits right downtown. They've created a standing wave system there that's used for kayaking, and a lot of stand up river surfing, too. It's interesting and unique and a big draw for us. The bike paths along the water provide alternative ways to get around town, and we have some overlook decks on the river where people love to stop and watch the activities there and that happens almost all year-round."

The University of Montana is located in Missoula, which not only brings thousands of students to town each year, but with them comes culture, diversity and outside perspective, all of which adds to Missoula's community.

"The relationship between the university and the city is key in vibrancy, connection and culture around the city," Means said. "We have a strong arts and culture and music scene here, largely thanks to the students. That piece makes us even more vibrant and growing, too."

In addition to a vibrant community and engaged residents, Missoula was already on the map for sustainable practices and multiuse facilities, and it continues to move forward with future revitalization and beautification plans.



Due to the large population of college students, Missoula has a very active music scene. (Photo by Athena)



Missoula prides itself on having an eclectic sense of community, a diverse mix of longtime residents, university students, artists, musicians and tourists. (Photo by Bari Love)

According to the APA website, Park Place, an international award-winning parking structure built in 2013, provides 333 parking spaces and includes a locally owned market and restaurant. It also features 85-kilowatt solar photovoltaic panels on the roof that provide 80 percent of the energy needs of the building, local art and recently installed electric vehicle charging stations.

Major plans are under way to revitalize a former waste disposal site and industrial area adjacent to the river. The \$150 million Riverfront Triangle Development will construct the largest conference center in the region and include housing for all income levels; space for offices, retail and hospitality; as well as improved riverfront parks and trails.

A small-town vibe combined with big-city amenities and forward-thinking leadership solidifies Missoula's position as a unique, desirable place to live. And residents tend to agree.

"We get out and talk to the community about what's special in our community, and the key points we usually hear are about our environment, location, setting and landscape," Means said. "But they also talk about the care put into the community, the eclectic sense of the community, the diversity of the community. Something aside from the physical presence — a sense of helping each other out and being in this together is really cool." **M**

Cities spruce up their gateways

By BARB SIEMINSKI | The Municipal

If you've ever had to sell your home, you probably know all the little tricks to close the sale: make a batch of chocolate chip cookies a few hours before the buyers come so the aroma will fill the house; clean the house thoroughly; move personal possessions out of sight. If you can afford it, staging is an excellent idea.

The first and most important impression is to get a potential buyer to stop by is curb appeal. You want prospective buyers to picture themselves in your home. The same applies to your city or town. Even if visitors are just passing through, you want the gateway to your city to pleasantly greet them.

More and more cities have been creating gateway beautification projects at points of entry to welcome visitors—think tourist dollars—and leave them feeling as though they're coming home.

A town can extend its spirit of homecoming to guests through meticulous landscaping and gardening at the gateway entrance; doing away with blighted gateway areas; adding new parks; and utilizing environmentally friendly rain gardens. Redeveloping the shuttered gas stations into contemporary businesses; changing some open spaces into things of beauty; and adding attractive gateway corridor signage or street murals are also desirable.

Employing landscape architects can pay off handsomely in giving your city an identity of its own, especially if you have a well-known attraction or history. Shout it out with large colorful posters, ribbons, banners or flags, a distinctive logo or an abstract artistic expression. Plant similar trees on either side of the corridor so they arch as vehicles pass underneath.

Winnemucca, Nev., population 7,396, is one city that undertook such an endeavor to entice travelers entering the city from off-ramps, said Mayor Di An Putnam, of the project that took place four years ago.

"Our gateway project consisted of a joint project with Humboldt County, Winnemucca Convention and Visitors Association and the city of Winnemucca," said Putnam, adding that the development cost approximately \$500,000.



Pleasant plantings have been used along I-71 South in Cincinnati, Ohio. Plants are maintained by park staff. (Photo provided)



Concept art relays several of the beautification efforts that were planted for the Interstate 71/Eden Park Drive Gateway in Cincinnati, Ohio. (Photo provided)

"The endeavor was to beautify the entrance into our community. We put in new sidewalks and signals and walls saying 'Humboldt County' and 'City of Winnemucca.'"

According to Dave Gamstetter, superintendent of operations in Cincinnati, Ohio, his department has done multiple gateway projects so he has chosen one that seems to have a lasting impact to share with The Municipal's readers.



Using varying colors, this chart highlights changes in market value from 1996 to 2012, post-gateway beautification efforts completed by the Cincinnati Park Board. Overall, the Eden Park area saw an increase of \$70,339,660 in total market value, some of which was likely impacted by the improvements. (Chart provided)

"This particular interchange is the gateway into downtown off I-71 at Eden Park Drive to Elsinore where I-71 enters the city. It was a very ugly city entrance and also a main entryway. Additionally, it is in the middle of the cultural hub in the city.

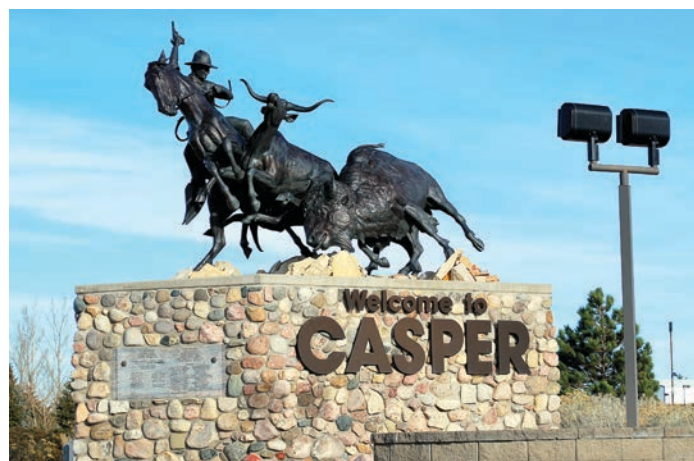
"We started with a plan, which we implemented over a two- to three-year period. This included the interchange of Reading Road at Eden Park Drive with I-71 overhead; this particular area was partially maintained under the state's Adopt-a-Highway program. Mill Valley Corporation, which picked up litter there a few times weekly, has since moved on, so we do it all now. Park staff maintains the turf, plant and flowerbeds," he said.

New development was built after the intersection was beautified between the beginning of the project and 2012, according to Gamstetter, who added that the county real estate valuation showed a great increase in the property valuation which occurred after the interchange was beautified.

"ODOT was a partner along with our local Keep America Beautiful affiliate KCB (Keep Cincinnati Beautiful) and took place approximately 2000-2002," said Gamstetter. "The project was done by our Cincinnati Park Board and took a little over two years. The cost was around \$150,000 plus a lot of volunteer and in-kind resources.

"It is hard to measure the exact impact of the beautification but no other infrastructure changes were made; the landscaping was the main improvement that we believe at least in some measure encouraged developers/businesses to build there."

An analysis was completed examining the property value changes to greenspaces in the Eden Park Drive corridor from 1996-2012. Some of the spaces saw a significant increase of \$10,000,000-plus while others had more moderate changes in value. Overall, in 1996, the total market value was \$39,385,950; this saw an increase to \$109,725,610 in 2012, a difference of \$70,339,660. The beautification played a role in that increased value since no other infrastructure investments were made.



"CY Right of Way" is the Westside Gateway located at the intersection of Wyoming Boulevard and Highway 220, and it portrays the dedication of Wyoming cowboys driving stray steers along the North Platte River toward the C.Y. Ranch House. (Oscar C. Williams/Shutterstock.com)



Gateway beautification is a means for cities to put their best foot forward. Pictured is one flowerbed that Cincinnati, Ohio, put in to do just that. (Photo provided)

According to Gilda Lara, executive director of Casper, Wy., her city has three large gateway beautification projects that have been completed through the efforts of their beautification committee dating back to 2001.

"The Casper Area Chamber of Commerce actively participates in city beautification efforts, including the landmark gateway sculptures that sit at the entrances to our great city thus creating the beautification committee," said Lara, noting these sculptures are reminiscent of famed Western artist Frederic Remington.

In addition, the Casper Area Chamber of Commerce and the beautification committee have collaborated with several local and statewide agencies on projects such as the cleanup and remediation of the Amoco/BP refinery and the Platte River Trails while also planting trees and providing green spaces throughout the city.

"The structure of the chamber's beautification committee is to be comprised of individuals employed by chamber member organizations in any industry for the sole purpose of actively participating in city beautification efforts, including the landmark gateway sculptures that sit at the entrances to our great city," concluded Lara. M



Trail networking for health and fun

By BARB SIEMINSKI | The Municipal

Leave it to a Cameron County, Texas, physician/city commissioner to come up with a trail network that not only benefits the health of her city, Brownsville, but also its surrounding communities — Los Fresnos, San Benito, Rancho Viejo, Laguna Vista, Port Isabel, South Padre Island, Los Indios, Rio Hondo, Harlingen and Combes — all of which make up one of the poorest counties in the nation.

Rose Gowen, M.D., used her medical knowledge and compassion to bring good health and much-needed outdoor activity to her community. Gowen, a Brownsville native, graduated from the University of Houston in 1980.

“In 2007, I was visited by Dr. James McCormick, the dean of the University of Texas School of Public Health here at the Brownsville Campus,” said Gowen.

“The campus had been established in approximately 2001 when the state legislature created the Regional Area Health Science Center in the valley. Dr. McCormick was trying to recruit clinicians to participate in clinical research and he landed on my doorstep. I said ‘yes’ not really knowing anything about public health. At that time, I was growing bored with clinical practice and asking myself, ‘Is this all there is?’”

As Gowen became involved she learned what the RAHSC was finding: one in three people are diabetic and 50 percent of those people are unaware they are; the state had the highest limb amputation rate;

and it also had very high rates of nonalcoholic liver cancer. All of these were due to very high rates of obesity and could be avoided with healthy eating and increased physical activity.

These published scientific findings guided Gowen’s public health team and community members to work toward healthy eating choices and active living — as well as the policy that promotes these things.

In writing a weekly newspaper column and getting highly involved with creating a farmer’s market, Gowen grew to see that “health” was not being looked at or spoken about in city government.

“I decided to run for office to change that,” said Gowen, who had also learned the economic impact of being unwell and wanted to make policy makers aware and responsive.

“It’s been a wonderful ride and I am now serving my third term. While attending an Active Transportation conference where the theme was bicycle tourism, we were impressed with the earnings of other parts of the country that are destinations for bicycle and active

LEFT: Pictured is the Brownsville Historic Battlefield Trail in Texas. It is one trail in a network of them throughout Cameron County, all aiming to get residents active. (Photo provided by Rails-to-Trails Conservancy)



ABOVE: Pictured is the Belden Rail-Trail in Brownsville, Texas. (Photo provided by Rails-to-Trails Conservancy)



ABOVE: Not only are cyclists, runners and walkers getting exercise, they are also able to explore Cameron County's tropical desert habitats. (Photo provided by Rails-to-Trails Conservancy)

tourists. We began thinking that if we were one such destination, we could generate 'new' money (new tourists) while at the same time inspire our own people to get off the couch and take a walk, run, kayak, ride a bicycle and thus lowering our rates of physical inactivity and improving access to such trails."

The group applied to the Legacy Foundation for funds to create a plan to connect their cities and was awarded \$100,000. Each city then put approximately \$10,000 of its own money into the pot and was able to hire expert consultants and achieve what is now called the active plan. This visionary endeavor consists of 428 miles of trails and routes both on and off the road, plus in the water.

"Our active plan caught the attention of the Rails-to-Trails Conservancy, and we were adopted or endorsed by them as one of their TrailNation projects," said Gowen. "This has given us validation on a national level and has given us experts to assist with fundraising and policy that will impact the completion of the plan. The biggest challenge will be the money to complete the plan."

The active plan was finalized and adopted by all cities in 2017, and Gowen and her team are currently working on a governance framework.

No formal partnership policy exists at this time, but all donations are welcome, according to Gowen.

"We — the 10 cities and Brownsville — are all partnering with Rails-to-Trails for implementation," said Gowen. "Trails are for walkers, joggers, bicyclists, bird watchers and the water routes are for kayakers and canoes."

According to Brandi Horton, the communications director for the Rails-to-Trails Conservancy, the nonprofit organization is dedicated to creating a nationwide network of trails from former rail lines and connecting corridors, building better places for improved people.

The organization has more than 160,000 members and supporters; 3,000 miles of rail-trails and multiuse trails; and more than 8,000 miles of potential trails. The goal is constructing more walking and biking communities nationwide.


"There are important lessons that communities can learn from across the country when we leverage active transportation and active tourism as tools to address significant social needs," said Horton, adding that the active plan as a TrailNation project was adopted because of its focus on health and economic development in a unique place.

Mayor Cyndie Rathbun of Rancho Viejo is very enthusiastic about the venture, calling it an "awesome plan."

"I couldn't be happier to see it come to fruition," she said. "The town of Rancho Viejo is very proud to be part of the innovative Lower Rio Grande Valley Active Plan. We know our area of the country is in a high-risk zone for increased incidence of diabetes, obesity and poverty. Additionally, the Lower Rio Grande Valley lacks the adequate infrastructure and opportunities for pleasant and safe outdoor activities. The active plan serves to remedy these problems in one fell swoop."

"By providing a safe and vibrant trail that connects municipalities, important historical destinations, federal and state parks and a World Birding Center, the trail provides our residents with a way to explore the unique beauty of our tropical desert habitats with their families. But beyond just studies that prove this, it is obvious that our residents will benefit from a trail nearby not just in terms of their physical health, but in their emotional well-being, too."

Finally, Gowen is elated that the public is "intrigued and interested."

She commented, "This is evidenced by the Legacy Foundation granting an additional \$2 million to Brownsville and \$1.2 million to Harlingen to extend trails in their cities ... the first funding of the plan network. These awards were granted in the spring 2018 ... proving that people across the county are interested and looking forward to trails." 

On the Web

More TrailNation and active plan information can be found at www.railstotrails.org/activeplan.



Phoenix addresses skills gap with apprenticeship program

By CATEY TRAYLOR | The Municipal

Hands-on learning, one-on-one interaction, classroom studies and camaraderie are a few of the keys to an impactful career experience, as demonstrated by the inaugural year of the Phoenix Public Works Department's Solid Waste Equipment Operators Apprenticeship Program.

In recent years, the Arizona city has faced a challenge similar to public works departments across the nation — a combination of retirements, competitive salaries elsewhere and the need for specialized licenses led to a shortage of qualified, quality solid waste equipment operators. Due to this need, the SWEO apprenticeship program was born.

"We figured instead of competing with all the industries that require a CDL (commercial driver's license), we would focus less on competing for the small talent pool and instead create our own pool of

talent by investing in our training team and bringing people from the outside in to train them from the ground up," said Felipe Moreno, deputy public works director.

The first program of its kind in the nation, apprentices in the year-long program learn the ins and outs of solid waste collection. SWEOs are charged with providing residential solid waste collection for over 400,000 Phoenix residents. This includes garbage, recycling, organics and bulk trash.

ABOVE: With its Solid Waste Equipment Operators Apprenticeship Program, the Phoenix Public Works Department hopes to get people in the door, potentially jumpstarting lifelong careers. Pictured are members of its graduating 2018 class. (Photo provided)

Moreno said the program requires no experience, and it asks only for solid work ethic and a good attitude from apprentices.

"Apprentices get their CDL in the first two months, and the rest of the year is (spent) learning the industry, safety, how we map the city, customer service and Phoenix culture in general," Moreno said. "During that year, they underfill the position of an equipment operator and get experience in the vehicles with seasoned professionals."

Upon completion of the program, apprentices are ready to join the workforce.

The first class was comprised of seven apprentices from various positions across the city.

"We chose internal applicants for our first class because we wanted every apprentice to have a landing place and a chance to go back to their old job in case things didn't work out," Moreno said. "However, they all graduated successfully and are still with us."

This year, the program went external. In an effort to increase diversity of background and experience, the application for the apprenticeship program was promoted through the state's website, the Phoenix Human Resources Department and partnerships throughout the city.

"We partnered with various nonprofits because we wanted to target our youth, veterans and organizations with nontraditional staffing," Moreno said. "We're trying really hard to create a pipeline of a talented, trained workforce for us and to diversify the workforce, reaching out to women and youth, letting them know this is an opportunity for them, as well."

Of more than 300 applicants, seven were chosen for the 2018 class.


Moreno said aside from the opportunity to learn a trade and earn a CDL, apprentices are given a chance to get a jumpstart in a profession that could turn into a career and open doors for them down the line.

"We're banking on getting these people in the door and selling them on what it is that we do," Moreno said. "Sometimes, it's not all about the pay. We have great benefits, a unique culture and a great pension system. We have the ability to grow you. Most of our staff were drivers at some point — this is the chance for you to get your foot in the door."

Feedback from participants has been overwhelmingly positive, and the first class of apprentices is doing well in the workforce. In terms of future planning, Moreno said he's taking it one day at a time, keeping in mind the resources available to him.

"Being a young program, we're trying to grow into this slowly and graduate people who are ready to be great," he said. "We would love to grow and expand the program, but we're a few years out from that. We need more resources — more people able to train the classes. Right now, we're doing all of this with existing city resources. Any more than a handful of apprentices and we're watering down the quality for quantity. We don't want to do that."

With the program only in its second year, Moreno admits he doesn't have all the answers — but he's happy to lend an ear and advice to other communities looking to implement something similar.

"We're the first municipality in the country that's doing this, but a lot of communities are reaching out to talk about it," he said. "We're willing to share our curriculum, infrastructure, logistics — we know this is a nationwide issue, so there's no need to reinvent the wheel. Go to people who are doing something similar to what you're looking to do and pool your resources. We're happy to help." 



Apprentices learn the ins and outs of solid waste collection during the yearlong program. (Photo provided)



In addition to learning about solid waste, apprentices in Phoenix's Solid Waste Equipment Operators Apprenticeship Program learn about the city itself and its culture. (Photo provided)



An Phoenix SWEO apprentice relays her experiences during an interview. (Photo provided)



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Quality of life is Kirkland's economic development strategy

By JULIE YOUNG | The Municipal

Kirkland, Wash., is a Pacific Northwest gem that really has it all. A suburb of east Seattle in King County, Kirkland is a community of 88,630 that is consistently ranked as one of the most livable communities in the country. It boasts unique neighborhoods, a quaint downtown area, plenty of green space and a penchant for attracting a number of STEM-related businesses and companies, including the tech giant Google.

"Kirkland is fortunate to be in a great ecosystem," said City Manager Kurt Triplett. "As part of the greater Seattle region, when Seattle does well, we do well. However, one thing that is unique to Kirkland is the fact that our economic development strategy is

a quality of life strategy and it's something we never take for granted."

During the Great Recession of 2008, a survey discovered that approximately 65 percent of all corporate businesses in the greater Seattle area had a CEO or other

ABOVE: Located in the Pacific Northwest, Kirkland offers plenty of recreation options. After it cut its parks budget, residents spoke up and voted to raise their taxes to support the parks and their amenities. (Photo provided)

senior officer who lived in Kirkland—a fact that was not lost on city officials. One such individual was Google executive Pete Wilson who liked the community and was in no hurry to leave. When Google announced that it needed to build a new campus to meet the rapid growth of its engineering teams in the state, Wilson suggested that they build in Kirkland to give the company the facility it needed without having to move.

"The fact that he wanted to stay here reinforced what we already knew — that we had a very livable community and we decided to be more intentional about keeping it that way," Triplett said.

It almost sounds counterintuitive. Typically, communities attract businesses to their regions and then residents follow. However, Kirkland discovered that in the technology sector, the opposite occurs. Those individuals choose where they want to live with the same kind of care that they choose their job. Tech workers have certain lifestyles they like to maintain, and they expect a wide range of cultural amenities throughout the communities in which they live. When they find the perfect place to put down roots, the companies often follow.

"When you build a great place to live, people want to stay," Triplett said. "That gives you great people, which in turn attracts great businesses."

Triplett admitted that it can be a gamble, especially if the focus of your plan is strictly economic, but by developing a plan that is more altruistic, the byproduct is thoughtful development, great schools, engaged citizens and a great community that people want to be part of.

"It is a conscientious economic development strategy that is community focused," he said.

In order to keep the community active and engaged, Kirkland officials are constantly asking residents whether or not they are hitting the mark and how they can do better. They also work with residents to identify solutions. During the recession, Triplett said like many cities throughout the nation, Kirkland had to make a number of cuts to its parks department. This was later identified as an area of importance to residents who voted to raise their taxes in order to pay for these important amenities.

"It passed in a ballot measure as did a recent proposal to improve the roads along our main arteries, which were getting a little long in the tooth," Triplett said. "We are careful about what we ask the public to vote on, and we are accountable and transparent about what we do with those funds so that our citizens can feel confident about entrusting their leaders to respond to the needs they have identified."

In order to prepare for these ballot measures, Kirkland has created a city work plan, which lays out the quality of life measures to be adopted over the next two years. While there are the usual line items included in the budget, such as police, fire, sanitation, etc., there are also large, multi-departmental initiatives as well. If the initiative is passed in a ballot measure, then the next year the city will raise the funds to pay for it before executing the end result.

In 2016, the public suggested that Kirkland needed to do a better job of combatting homelessness throughout the community. The city wanted to be the first municipality on the east side to have a homeless shelter for women and families so it partnered with a regional coalition for housing — as well as churches and other nonprofits — to construct the eventual space.

"That's a project that has been one of our goals for two years," Triplett said. "We identified the need and found a site and now we are raising the money to build it in 2019. After that, we will operate it."

Another initiative is to build a better relationship between the police and residents, shifting to a community-based model. This initiative doesn't cost much but will change the way everyone interacts with one another. Rather than spending time in their cars, officers are encouraged to go into the local church or mosque so that folks can meet and interact with those who are working hard to protect them.



A magnet for STEM-related companies and business, Kirkland, Wash., has put special emphasis on maintaining its quality of life in its economic development strategy. (Photo provided)




Kirkland has welcomed several tech professionals and companies, including Google. The city has found that tech workers choose where they want to live with the same kind of care that they choose their job, expecting the city to host the amenities they crave. (Photo provided)

The city has also been working hard to have its own animal control center that allows folks to adopt and obtain licenses closer to home.

"Jennifer Matison is our animal control officer and she is the most photogenic person who is always posting selfies with the animals," Triplett said.

Triplett said creating a livable community is not earth shattering, but it is common sense. It begins with intentional, strategic planning; being accountable for the decisions that are made; and then asking again to ensure that you hit your mark.

"It's all about being methodic, doing what is important and reevaluating along the way. Some things aren't as important or as feasible from one year to the next, but it is a process that works. I feel lucky to be in Kirkland where there is an amazing and engaged city council who wants to make the community a better place for those who live here," he said. 



Saluting the Doughboys, gone but not forgotten

By ANDREW MENTOCK | The Municipal

Since 1954, the United States of America has celebrated Veterans Day on Nov. 11 to commemorate the men and women who served their country in a military capacity. On this day, veterans are to be treated with the utmost respect.

But this is not the original name of the holiday. Starting on Nov. 11, 1919, the citizens of the United States and people all over the world began to celebrate the anniversary of World War I's end, which occurred Nov. 11, 1918, with the signing of the armistice between the Allies and Germany.

Thus on Nov. 11, 1919, President Woodrow Wilson recognized the day as Armistice Day.

"To us in America, the reflections of Armistice Day will be filled with solemn pride in the heroism of those who died in the country's service and with gratitude for the victory, both because of the thing from which it has freed us and because of the opportunity it has given America to show her sympathy with peace and justice in the councils of the nations," Wilson said.

It was not until after World War II that the name of the day was changed to Veterans Day to celebrate military personnel and others who served the United States in either war.

This year, however, the holiday will mark the 100th anniversary of Armistice Day and the end of a war that changed the world in many ways.

And while all the veterans of the war are no longer living—the last surviving U.S. military veteran of World War I, Frank Buckles, passed away Feb. 27, 2011—many cities in the United States are doing different things to honor their Doughboys, by recognizing their accomplishments and focusing on how the war helped shape America.

Norwich, Conn., for instance, has been planning for the 100th anniversary of Armistice Day for years, and the celebrations began in the fall to prepare local community members for the actual day.

Since Sept. 10, at the Otis Library in Norwich, city historian Dale Plummer has hosted talks related to World War I. A few examples of talks were on Polish Americans in World War I and African

LEFT: During World War I, American Marines head to a training camp in France. This year Nov. 11 will mark the 100th anniversary of Armistice Day, which later became Veterans Day. (Shutterstock.com)



ABOVE: Norwich, Conn.'s, German howitzer, which had been captured at the end of World War I, has been in need of restoration. With the 100th anniversary of World War I's end, the city has been able to galvanize support for the restoration. Ultimately, the city hopes to display it once again. (Photo provided)



President Woodrow Wilson reads the armistice terms to Congress. The armistice, which was signed Nov. 11, 1918, officially brought World War I to an end. Wilson would later recognize Nov. 11 as Armistice Day in 1919; ultimately, the holiday changed to Veterans Day following World War II. (Shutterstock.com)

Americans in World War I. On Veterans Day, there will be a talk on 100 years of women in the military.

"In terms of its long-lasting impact, (World War I) redrew national boundaries," Plummer said. "It resulted in an extension of civil rights to women, a new impetus to civil rights movements for African Americans and the



Pictured is a restored German howitzer located in a museum. Norwich, Conn., plans to restore its own howitzer soon. (Photo provided)

federal government became much more of a player in state and local affairs. They reached pretty far into local governments to get support for the war. In many ways, it reorganized society."

Plummer is also looking to highlight as many Norwich World War I veterans and volunteers who assisted in war efforts, such as nurses and Red Cross members. He is trying to collect as many names as possible and even plans to recognize a few of their surviving descendants.

Another part of the 100th anniversary celebration is fundraising to restore a World War I howitzer captured after fighting ceased. Plummer said that over the years the weapon has suffered significant wear, but he hopes to be able to restore it and put it on display once again.

"I've actually been working on trying to get this howitzer restored for 10 years," Plummer said. "So what's happened is those efforts have been galvanized by the 100th anniversary."

He said that it's important to celebrate this historic milestone because of the impact World War I had on the country and, in particular, Norwich, where an old Naval location was transformed into a submarine base that still functions today.

"That had a pretty big impact on the area," Plummer said. "There were a lot of people employed as civilian employees, or

were affected by the increased employment engendered by the war, but it also had a long-term impact."

Elsewhere in Niles, Mich., the pastor and groundskeeper at Community Evangelical Free Church recently rediscovered an old stone monument that featured a plaque in their front yard; it had previously been covered by bushes. The plaque paid tribute to 28 community members who assisted the United States in World War I, and it also commemorated Armistice Day.

In addition to restoring the plaque, the church is looking for any descendants of its 28 names in hopes to include them in the celebration for the 100th anniversary.

Niles likely won't be alone in rediscovering World War I monuments since in the years following the war, many, from small plaques and street signs to monuments and statues, were erected across the U.S. — and as they are uncovered, so too will be local history.

Plummer said putting on events, such as the ones in Niles and Norwich, can take a significant amount of time but are made much easier when local government officials are on board.

"I think one of the advantages we have is we have very enthusiastic support from our mayor, and the city manager has also been supportive," he said. "(They've) made this process much easier." **M**

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Deadline Monday, Nov. 5

JANUARY 2019
Maintenance & Operations
Deadline Monday, Dec. 3

FEBRUARY 2019
Streets, Highways & Bridges
Deadline Fri., Dec. 28*

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NOVEMBER

Nov. 1-2 WJTA-IMCA Expo

Morial Convention Center,
New Orleans, La.

www.wjtaimcaexpo.com

Nov. 4-8 2018 American Water Resources Association Annual Conference

Marriott Inner Harbor at
Camden Yards, Baltimore, Md.

www.awra.org

Nov. 5-8 Campus Fire Forum 2018

San Antonio, Texas

www.campusfiresafety.org

Nov. 6-9 Fire Findings: Investigation of Gas and Electric Appliance Fires

Fire Findings laboratory,
Benton Harbor, Mich.

www.firefindings.com/training/fire-investigator-training-seminars

Nov. 7-8 ARTBA Central Regional Meeting

Omni Chicago, Chicago, Ill.

www.artba.org/training-events/

Nov. 7-9 WWEMA 110th Annual Meeting

Eau Palm Beach Resort and Spa,
Manalapan, Fla.

www.wwema.org

Nov. 7-10 National League of Cities' City Summit

Los Angeles, Calif.

<https://citysummit.nlc.org>

Nov. 7-10 EMS Associates Summit 2018

Provo, Utah

emsassociates.com

Nov. 8-9 Sweeper Summit and Equipment Expo

Hilton Lake Las Vegas,
Las Vegas, Nev.

www.sweepersummit.com

Nov. 13-15 New Jersey State League of Municipalities Conference 2018

Atlantic City Convention Center,
Atlantic City, N.J.

www.njslom.org

Nov. 14-15 ARTBA Western Regional Meeting

Balboa Bay Resort,
Newport Beach, Calif.

www.artba.org/training-events/

Nov. 14-15 New Hampshire Municipal Association 2018 Annual Conference

The Manchester Downtown
Hotel, Manchester, N.H.

www.nhmunicipal.org

DECEMBER

Dec. 3-6 Groundwater Week

Las Vegas, Nev.

groundwaterweek.com

Dec. 4-6 Power-Gen International

Orange County Convention
Center, Orlando, Fla.

www.power-gen.com

Dec. 4-7 Florida Parking & Transportation Association 2018 Annual Conference and Trade Show

Sawgrass Marriott Golf Resort
and Spa, Ponte Vedra Beach, Fla.

www.parking.org/calendar/florida-parking-transportation-association-2018-annual-conference-and-trade-show/

DECEMBER

Dec. 9-12 Safety and Health Conference

B Resort & Spa, Lake Buena
Vista, Fla.

www.ffca.org

JANUARY

Jan. 11-15, 2019 American Correctional Association 2019 Winter Conference

New Orleans, La.

www.aca.org

Jan. 15-17, 2019 Northern Green Trade Show

Minneapolis Convention Center,
Minneapolis, Minn.

northerngreen.org

Jan. 16-18, 2019 Arkansas Municipal League 2019 Winter Conference

Statehouse Convention Center,
Little Rock, Ark.

www.arml.org

Jan. 18-19, 2019 Massachusetts Municipal Association Annual Meeting and Trade Show

Hynes Convention Center and
Sheraton Boston Hotel,
Boston, Mass.

www.mma.org/mma-annual-meeting-and-trade-show/

Jan. 19-20, 2019 Piedmont Fire Expo

Twin City Quarter (The Benton),
Winston-Salem, N.C.

www.piedmontfireexpo.com

JANUARY

Jan. 20-24, 2019 FDSOA Apparatus Specifications & Maintenance Symposium/ FDSOA Annual Health and Safety Forum

Wyndham Orlando Resort
International Drive,
Orlando, Fla.

www.fdssoa.org

Jan. 23-25, 2019 U.S. Conference of Mayors 87th Winter Meeting

Capital Hilton Hotel,
Washington, D.C.

www.usmayors.org/meetings/

Jan. 23-26, 2019 Fire-Rescue East

Ocean Center,
Daytona Beach, Fla.

www.ffca.org

Jan. 24, 2019 Rhode Island League of Cities and Towns 2019 Showcase Event

Crowne Plaza Hotel,
Warwick, R.I.

www.rileague.org

Jan. 28-31, 2019 Heavy Duty Aftermarket Week

The Mirage, Las Vegas, Nev.

www.hdaw.org

Feb. 19-21, 2019 Indiana Parks and Recreation Association Conference and Expo

French Lick Resort,
French Lick, Ind.

<http://inpra.evrconnect.com/conference>

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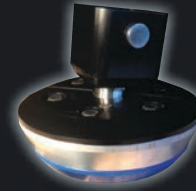
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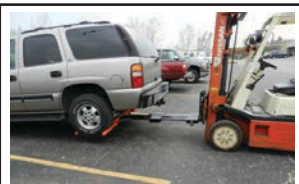
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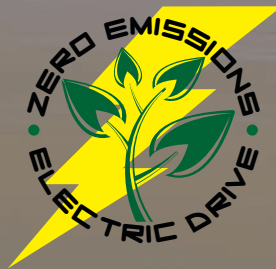
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Top 10 best metro areas for STEM professionals

Earlier this year, WalletHub released its list, “2018’s Best & Worst Metro Areas for STEM Professionals,” where it determined the best markets for STEM professionals. It “compared the 100 largest metro areas across 17 key metrics. Our data set ranges from per-capita job openings for STEM graduates to annual median growth for STEM jobs to projected demand for STEM workers by 2020.”

Of those 100 metros, Seattle, Wash., led the pack with a total score of 73.60. It ranked second in professional opportunities, fourth in STEM-friendliness and 15th in quality of life.

Other top 10 finalists are listed below.

Rank	Metro Area	Total Score	Professional Opportunities Rank	STEM-Friendliness Rank	Quality of Life Rank
1.	Seattle, Wash.	73.60	2	4	15
2.	Boston, Mass.	71.94	7	1	43
3.	Pittsburgh, Pa.	65.90	12	11	9
4.	Austin, Texas	65.15	6	8	27
5.	Minneapolis, Minn.	64.95	19	6	17
6.	Madison, Wis.	64.00	13	16	13
7.	Salt Lake City, Utah	62.96	9	14	18
8.	Springfield, Mass.	62.80	36	2	7
9.	Chicago, Ill.	60.71	49	13	8
10.	Atlanta, Ga.	60.69	5	27	31

Source: <https://wallethub.com/edu/best-worst-metro-areas-for-stem-professionals/9200/#>

A

Aladtec, Incorporated	5
Alumitank	54

B

Bonnell Industries	Back Cover
Boss Industries	16

C

Clearspan Fabric Structures	21
CVG	41

D

D & D Instruments	21
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E

Ebac Industrial Products, Incorporated	40
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F

4 State Trucks	31
Fecon, Incorporated	31
Frost Incorporated	40

G

Global Environmental Products	51
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H

Halliday Products Incorporated	40
Harmony Deicing	31
Hiniker Company	16
Hotsy	21

I

ICOM America, Incorporated	2
Imel Motors	41

L

Land Pride	14
Larry Stigers Equipment, Trailers & Trucks	7

M

Magellan GPS	Cover, 10-11
Mitch Lee Products	49
Monroe Truck Equipment	20

N

National Construction	30
NTEA - The Work Truck Show	47

P

Proemion Telematics Systems	46
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R

RPM Tech	15
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S

Silt-Saver, Incorporated	9
SWPPPTack	3

T

Tire Service Equipment	55
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V

Varco Pruden Buildings	46
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W

Wisconsin Surplus Auctions	50
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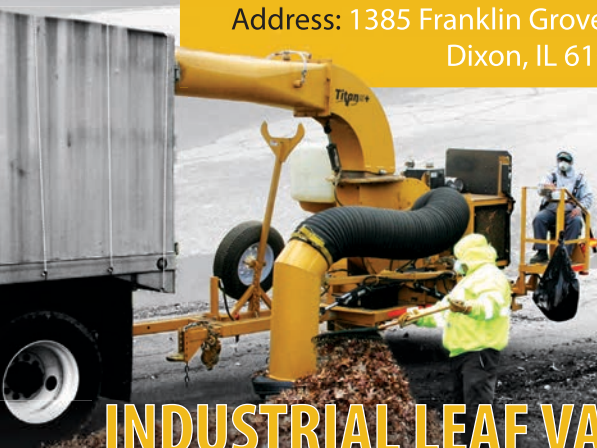
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