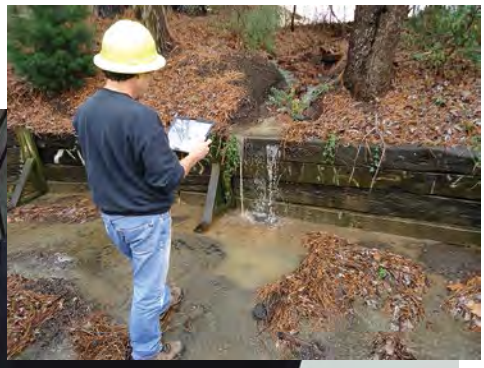
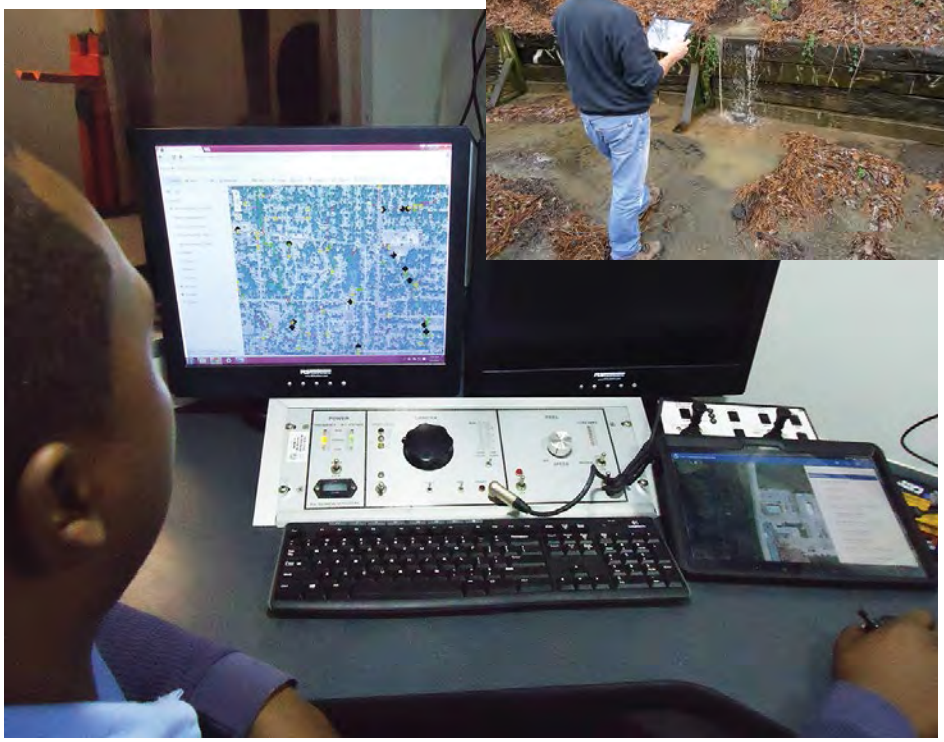
Esri News
for State & Local Government
Fall 2016

City of Memphis Public Works Reduces Response Time by 33 Percent

By: Keith Cooke, Esri





Like many other public works agencies, the Public Works Division of the City of Memphis has an enormous breadth of responsibilities, the bulk of which is responding to citizens' complaints, from damaged drain pipes to potholes in streets to missed trash pickups to missing sanitary manhole covers. As a result, over 80 percent of the complaint tickets coming to the city's Oracle E-Biz CRM 311 system are dispatched to Public Works. On average, this translates to about 400 tickets per day.

Division staff faced many challenges in trying to coordinate and manage the work in the most efficient way. One major challenge was the inability to see job locations and analyze other pertinent data, such as infrastructure, ownership, or parcel information. Use of their outdated paper-based system resulted in inefficient workflows, delays, job overlaps, and bottlenecks. Field staff didn't have access to all the information they needed. Consequently, this affected resolution of work orders.

Staff from the Drain Maintenance Department within Public Works requested that the Enterprise GIS Department of Information Services Division work with them to develop an end-to-end solution for tying operational work processes, enabling the management team and field supervisors and crew to have near real-time access to service ticket information. In addition, all relevant location data had to be made available, either out in the field or in the back office, for reporting and dashboard purposes.

Della Adams, GIS manager for the city, and her team decided to produce a suite of maps and apps in ArcGIS Online. Before the first model was created, though, Adams pursued buy-in from departmental leadership. This was an absolutely crucial component to the success of the project. Further, she maintained contact with both leadership and staff during the process to help solidify the success of the solution.

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City of Memphis Public Works Reduces Response Time by 33 Percent

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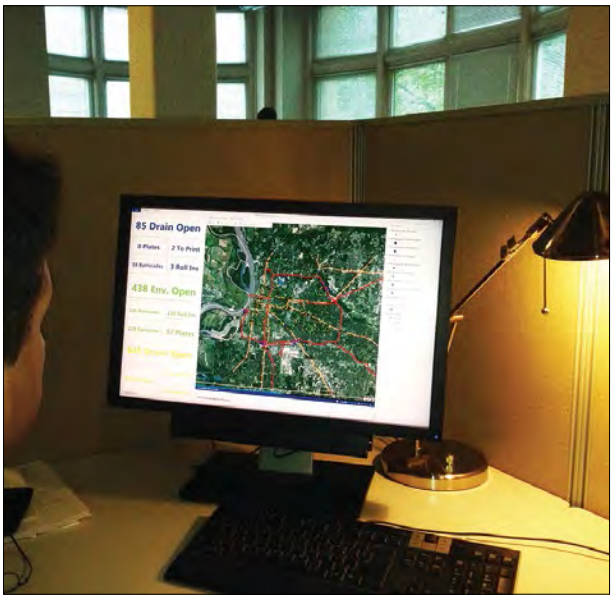
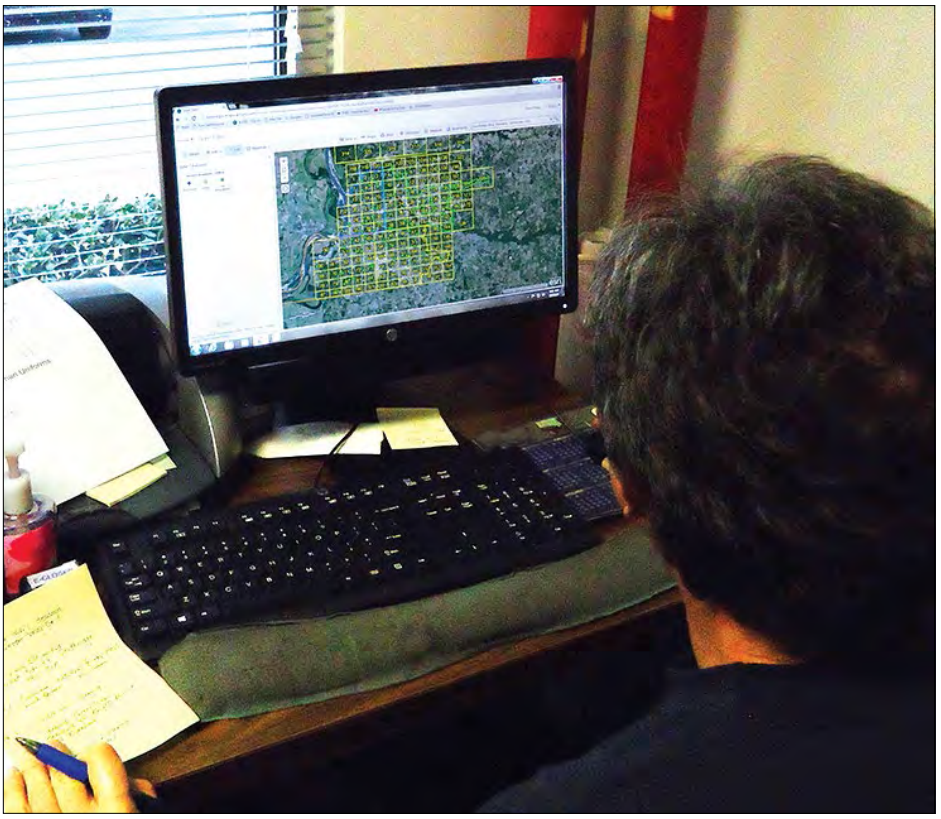
This solution gave Public Works staff the ability to capture and incorporate service requests from the Oracle CRM 311 system with the feature class in the geographic information system (GIS). This gave them the ability to see on a map, from either their office PC or mobile device in the field, exactly what and where their outstanding tickets were at all times. Now, department staff can manage all their tickets in this geodatabase environment, including allowing editing in the field.

While the solution certainly benefits the field crews, it empowers the entire chain of command in Public Works. Supervisors can now readily and easily create standardized reports for management. Reports that used to only be available monthly are now updated and available on a daily basis. More than just looking at dots on a map, they can perform spatial analysis of the data in these apps, such as analyzing request types by zone and time. In addition, the division and deputy directors now have access to a real-time operational dashboard that relays the performance metrics of the department, and they are able to make adjustments to labor and resources as needed. The ArcGIS platform is now tying the entire department together to not only be more efficient in the field but to make better, more sustainable and justifiable decisions in the office.



As a result of implementing this suite of GIS solutions for drain maintenance, department staff have reduced their ticket closing time by 33 percent from the previous year. The average time for closing service requests dropped from 12 to 8 days. Repairing cavity jobs shrank from nearly a month to just under a week.

Robert Knecht, director of Public Works for the City of Memphis, immediately saw the value of this solution. "The ArcGIS Online apps have provided the ability for my Public Works crews to have access to important and needed information in the field, plus allowing work to be completed in the field using the Collector [for ArcGIS] app, while also making it possible for my management team to have access to that same information using the [Operations] Dashboard [for ArcGIS] tool; all of which have changed the way we work and deliver services to citizens. Using these apps, we have significantly enhanced productivity levels and the efficiency at delivering services, as we are now able to make decisions more quickly based on accurate and timely data. Ultimately, these ArcGIS Online apps are revolutionizing how Memphis Public Works is able to provide services, as increased productivity and accountability, implementing new sustainable practices, and using information in strategic ways have really made a difference in how we are able to operate. Given our success, we're now looking to roll out this capability to all areas of Public Works."



Real-Time GIS as a Managed Service

If you're not factoring real-time geospatial analytics and mapping into your GIS strategy, you're leaving an immense gap in your ability to truly understand what's going on, why it's happening, and how you should respond. Later this year, Esri will unveil the ability to deploy Real-Time GIS as a managed service, enabling you to reliably ingest, analyze, and store millions of sensor events per second. You will be able to quickly visualize, replay, explore, and perform fast batch analytics on billions of features.

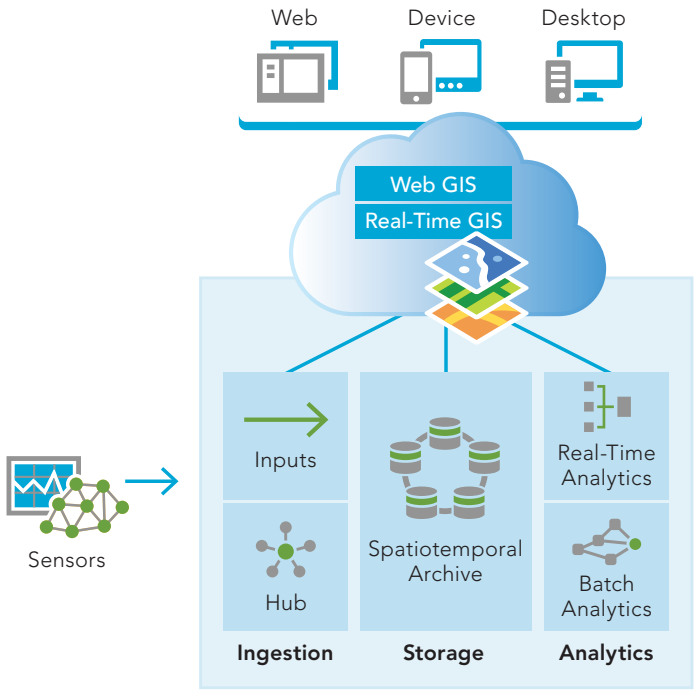
Currently, Esri offers Real-Time GIS capabilities via ArcGIS GeoEvent Extension for Server, which can be deployed on-premises or in the cloud. Ready-to-deploy images of ArcGIS for Server, including ArcGIS GeoEvent Extension for Server, are available via ArcGIS Server Cloud Builder on Amazon Web Services and for Microsoft Azure. GeoEvent Extension is currently used by hundreds of organizations across numerous industries, including agriculture, government, natural resources, transportation, and utilities.

The number of connected devices is rapidly increasing, and those devices are producing exponentially more data, creating a demand for higher data ingestion rates and faster analytics. While on-premises Real-Time GIS can process thousands of events per second—a rate that meets the requirements of many organizations managing small fleets of vehicles or sensor networks—the new Real-Time GIS as a managed service will reliably ingest, process, analyze, and store events that range from the tens of thousands to millions per second. That's fast enough to support smart cities the size of Los Angeles or London. It's fast enough to monitor all the sensors and smart meters used by major water, oil, gas, and electric utilities. It can efficiently track and analyze the movement and disposition of large fleets of trucks, ships, and aircraft, which are essentially moving sensor warehouses.

You can use Real-Time GIS to ingest real-time data streams from in-vehicle GPS devices, sensors, mobile devices, and social media providers. It accommodates multiple streams of data flowing continuously through filters and processing steps that you define so you can focus on only the most important aspects of your operations. It can track dynamic assets that are constantly moving (vehicles, aircraft, vessels, and people) or stationary assets that have attributes that constantly changing (pressure valves on a pipeline and weather monitoring stations).

This new Real-Time GIS as a managed service offering is composed of a distributed computing architecture designed to support the processing speeds and volumes of data produced by an emerging constellation of connected devices and sensor technologies. This technology will be offered through Esri Managed Cloud Services. Esri will provide customers with

Real-Time GIS as a managed service



ready-to-use instances of ArcGIS running in the cloud that can be easily scaled depending on your requirements. You can choose a cloud provider (initially Microsoft Azure and Amazon Web Services) and will be able to choose the cloud deployment region. Real-Time GIS as a managed service leverages multiple aspects of the ArcGIS platform including web GIS, real-time, and batch analytic capabilities that work with the spatiotemporal big data store. The Spatiotemporal Big Data Store is a central component of Real-Time GIS as a managed service. End users will be able to interact with the observational data stored in the spatiotemporal big data store using standard ArcGIS clients such as ArcMap, ArcGIS Pro, and web maps. Rather than display millions or even billions of points on a map, data can be aggregated on the fly for more effective visualization.

When the new Real-Time GIS as a managed service becomes available later this year, you will be able to reliably ingest, process, analyze, and store millions of sensor events per second. You will be able to visualize, replay, and explore extremely large datasets and perform fast, coarse-grained analytics on billions of records. Since you will be able to specify the region to deploy based on a selected cloud provider, you will be able to run continuous real-time analytics on nearby data with faster, more local access.

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ArcGIS helps Kansas City 'Keep Out the Rain'

Rain is generally a good thing, but, when stormwater makes its way into of the some of Kansas City's Missouri's more than 1,700 miles of separate sewer system the impacts can be devastating. In Kansas City, excess stormwater creates an average of 6.4 billion gallons of wastewater overflow each year.

Kansas City is one of more than 700 communities across the nation that must comply with regulatory standards for wet weather sewer overflows. In 2010, Kansas City entered into a federally-mandated agreement with the Environmental Protection Agency (EPA) to reduce sewer overflows by investing in the City's aging sewer infrastructure over a 25-year period. The result is Kansas City's $4.5 billion Overflow Control Program, which will capture and treat 88 percent of combined sewer flows and eliminate sanitary sewer overflows during heavy rainfall events.

In an effort to leverage each dollar of the investment, Kansas City is asking homeowners to help reduce the overflow problem by voluntarily disconnecting plumbing connections that are improperly connected to the city's sewer mains. The program, called Keep Out the Rain, can help Kansas City save millions of dollars in future capital improvements. Kansas City has initiated this targeted approach because private plumbing connections are believed to contribute to more than half of the rainwater that enters the sewer system.

"Our sewer system is designed to collect and convey wastewater to one of our 6 wastewater treatment plants," said Andy Shively, Chief Engineering Officer for Kansas City Water Services. "When rainwater gets into the sewer system, it can overwhelm our pipes, which in turn can cause overflows and basement backups. Once rainwater enters the sewer system, it must be treated, driving up maintenance and treatment costs."

Helping residents and field crews engage with the Keep Out the Rain program is made simple with the ArcGIS Platform which helps Kansas City communicate with residents, share large amounts of data, and coordinate and track project teams. Most importantly, ArcGIS helps Kansas City to analyze the results of the program, and report project success.

"Kansas City is committed to achieving the requirements of the City's federally-mandated consent decree in a way that improves neighborhoods and reduces program costs for our residents," said Shively. "ArcGIS is helping Kansas City to effectively manage the Keep Out the Rain program, and report improvements to the Environmental Protection Agency and to our residents."

To create the Keep Out the Rain program, Kansas City first turned to existing GIS data to pinpoint areas where fixing

improper plumbing connections on private property might be entering the City's sewer mains. The city found 55,000 properties where simple, cost-effective plumbing corrections could help make a big impact on reducing the City's overflow control issues.

Challenges of the project and How ArcGIS Has Helped

With 55,000 customers in a project area that spans more than 300 square miles there are a variety of challenges. From effectively communicating with the public the value of the program and getting a high level of voluntary participation, to sharing large amounts of data needed to perform a thorough evaluation with staff in the field, to coordinating and tracking the work being done by a diverse team of City staff and dozens of contractors from many different organizations, and finally analyzing the effectiveness of the program towards its mission of removing rain water from specific portions of the sewer system.

The ArcGIS Platform is being used in nearly all aspects of the program including:

- Public Outreach
- Project Coordination
- Data Collection and Data Sharing
- Analyzing Results

Esri Announcements

Eighth Annual Geodesign Summit

January 24–26, 2017, Redlands, California

Planning practitioners from all levels of government, nongovernmental organizations, commercial design firms, and academia are invited to attend Esri's eighth annual Geodesign Summit. By attending this event, you will learn how to implement the practice of geodesign into your organization and see how it can benefit your community.

To learn more about geodesign and what you will gain from attending this event, visit esri.com/Geodesign-summit.

Fourth Annual Esri Public Sector CIO Summit

March 29–30, 2017, Redlands, California

Mark your calendars for the 2017 Esri Public Sector CIO Summit to learn about the value of GIS in your organization's IT strategy. Esri experts, along with leaders from the public and private sectors, will explain how ArcGIS supports major technology trends, including the following:

- Data-driven decision-making
- Innovating government
- Open data
- Pervasive and predictive analytics

Visit esri.com/cio-summit to learn more and stay up to date on the lead-up to the 2017 event.

Esri's Massive Open Online Course Program

Did you know that Esri offers free online training through our massive open online course (MOOC) program? These classes help you better utilize the ArcGIS platform and only require a couple of hours of study per week. The best part is that no previous GIS experience is required, and you will be given full access to the tools you need for each course, free of charge!

The next MOOC, Going Places with Spatial Analysis, will begin on November 9, 2016. In this course, you will learn how spatial data analysis provides deeper understanding and improves decision-making.

To learn more about Esri's MOOC program, sign up for a MOOC, and see a list of upcoming MOOCs, visit go.esri.com/StateLocalMOOC.

E380 Snapshot

Have you checked out E380 lately? E380 is Esri's media channel, created to share how your peers are using GIS. On this channel, you will find stories about the benefits others have realized through their use of GIS, conversations with industry experts, and technology presentations. You can browse E380's full library at go.esri.com/StateLocalE380. Here is a snapshot of some of our latest videos:

Apps for the Field

Introducing a powerful, easy-to-use suite of apps to help you reduce paperwork, replace outdated workflows, and make smarter decisions. Watch this video at go.esri.com/StateLocalFieldApps.

Interview with Greg Hymel, City of New Orleans

Engaging citizens is important to the City of New Orleans, and city staff believe that government should be accessible to everyone. New Orleans' Where Y'at app, based on Esri technology, makes accessibility easy by sharing information about city services based on where citizens live. Watch this video at go.esri.com/StateLocalNOLA.

Raleigh Cleans Up with AppStudio for ArcGIS

Raleigh, North Carolina, is one of the fastest growing areas in the country. Between 2000 and 2014, the city's population increased by 59 percent. Downtown Raleigh has experienced dramatic growth in new residents and businesses as well. The downtown's retail base has increased by over 35 percent in the last four years, and events, festivals, museums, and attractions bring more than 3.5 million visitors to the downtown area each year.

By all indicators, Raleigh is flourishing. But this level of growth presents challenges.

Last fall, residents and business owners raised concerns about litter and cleanliness in downtown. Although multiple groups—including the Downtown Raleigh Alliance's (DRA) Clean Ambassadors and staff from the departments of Parks, Recreation and Cultural Resources and Solid Waste Services—contribute to keeping downtown clean, the demand was outweighing available services. So the City of Raleigh turned to its robust GIS—and used AppStudio for ArcGIS for the first time—to figure out what to do.

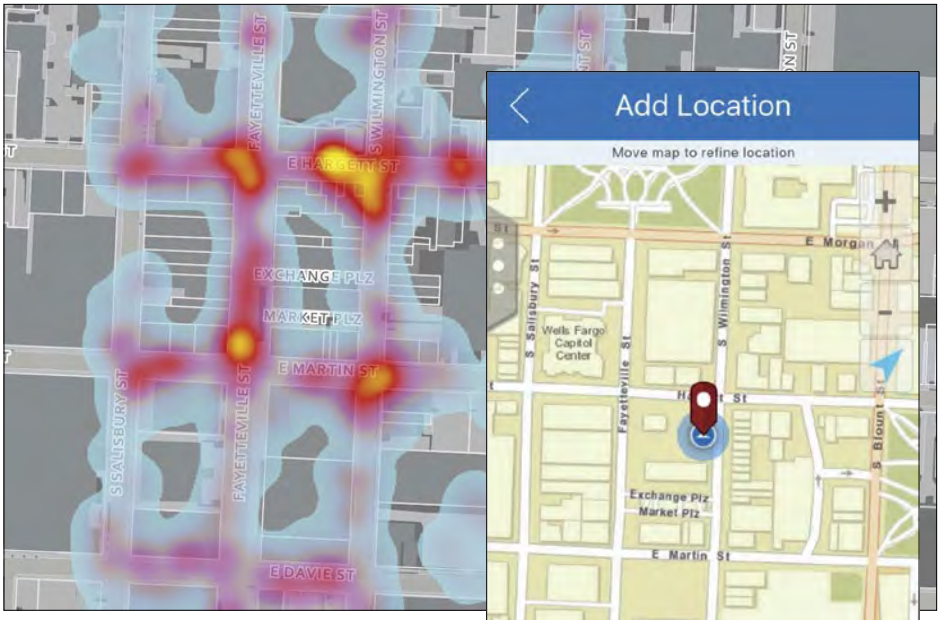
A Tool to Gather Location-Based Litter Data

Raleigh's Office of Sustainability and DRA worked with their service partners to form a task force and create a plan of action for tackling the city's litter problem.

Task force members first needed to understand the litter issue. They had to gather information and assess the magnitude, types, and locations of litter before they could make any recommendations.

But the timeline for completing the study was short. Because it was autumn and temperatures were beginning to drop, the schedule for events and activities taking place downtown was slowing down. A litter audit had to be completed quickly to provide the task force with any meaningful information.

An eight-member team from the Parks, Recreation and Cultural Resources and



↑ This heat map, which displays litter data collected using Litter Reporter, resulted in two additional solar-powered trash compacting units being placed at the corner of Hargett and Wilmington streets, where high densities of litter were recorded.

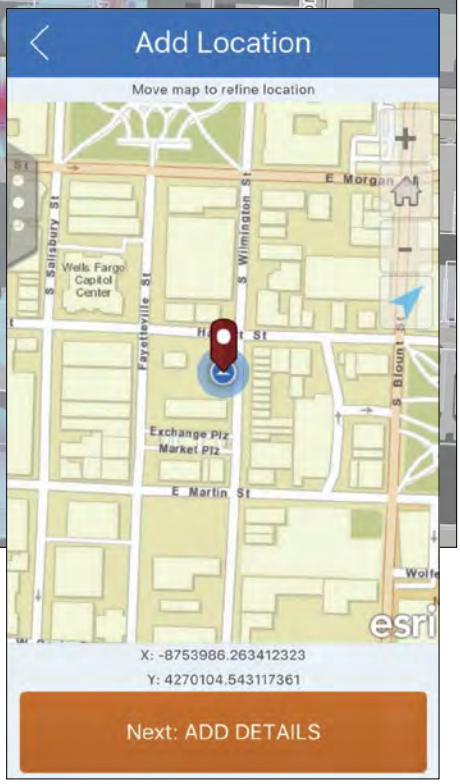
Solid Waste Services departments was looking for a tool to gather location-based information about the density and types of litter in downtown. The City of Raleigh's sustainability manager, Megan Anderson, contacted Raleigh's GIS team to get help.

"They have always been willing to take advantage of new tools and have an innovative approach to problem solving," said Anderson.

GIS and web app integration developer Justin Greco believed he could deliver a mobile application on a tight schedule using AppStudio for ArcGIS. He had learned about the app, in beta at the time, during the 2015 Esri User Conference.

"It was what first came to my mind when this project was brought to our team," he said.

Because of the project's short time frame, Greco said a custom-developed app was out of the question. AppStudio for ArcGIS, however, would allow him to configure a mobile app without spending time on coding or development cycles.



↑ The Litter Reporter app allows users to photograph litter, geotag its location, and select its type.

"The main advantage of AppStudio is how fast it was to set up," he continued. "I was able to have a prototype in under an hour."

He leveraged the city's existing maps and added a hosted feature layer to enable field staff to collect data and store it in ArcGIS. Working with members of the task force, it took Greco less than three weeks to build the mobile app, make minor adjustments, and install it onto eight smartphones.

Collecting Litter Data

The litter audit took place in October 2015.

The eight city staff members doing the audit received less than 15 minutes of training on the user-friendly mobile app, called Litter Reporter, just before they went out for the first time. Following

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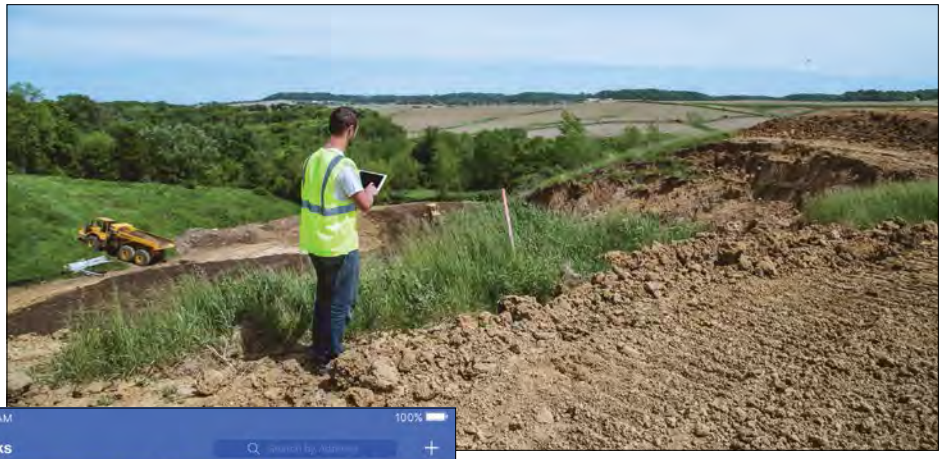
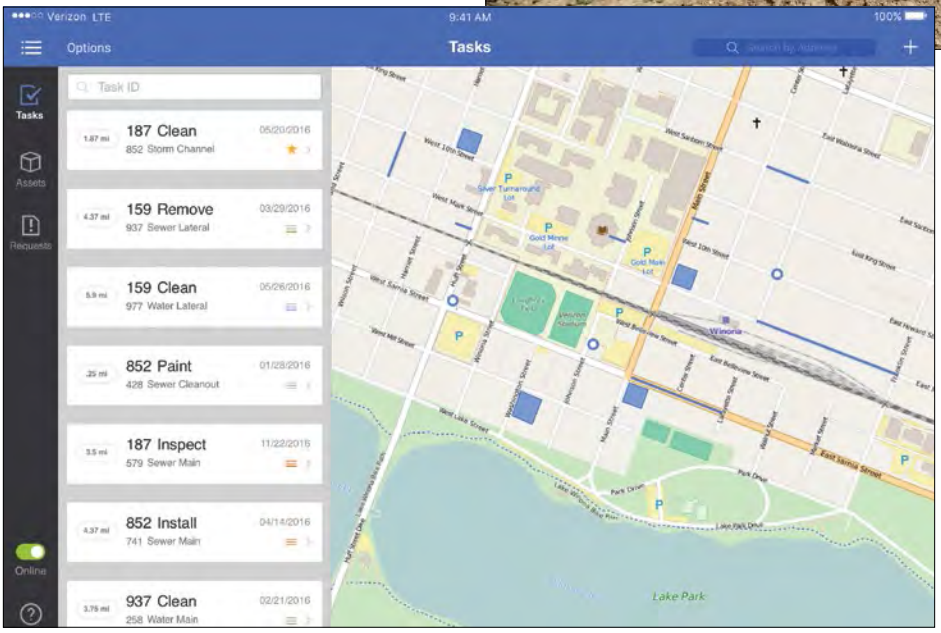
Field Crews Go Mobile in La Mesa, California

By: Katie Ernst, Cartegraph

After a decade of using Cartegraph 8, also known as Navigator, the City of La Mesa, CA was looking to move to a web-based system that would expand the capability of its field crews. With the objective of integrating multiple systems into a one-stop solution, the team decided to transition to Cartegraph's Operations Management System (OMS).

"Cartegraph OMS was the closest to integrating all those platforms that we had seen," says Greg Humora, Public Works Director for the city of 57,000. "The legacy system is powerful, but not nearly as user-friendly or mobile-friendly." According to Humora, the key to productivity would be to put a graphical interface into the hands of field workers. "It just makes more sense. With everything visual, it's easier to search and find things and input information."





↑ Crews in the City of La Mesa rely on mobile technology for their daily work. This screenshot of the Cartegraph for iPad application shows a list of assigned tasks, accompanied by an ArcGIS map. Workers can access and update the data from anywhere.

While Cartegraph 8 incorporated location-based data through an Esri integration, making changes to that information could be challenging. Workers would submit revisions on marked-up drawings and the correction process was time-consuming. "They would get frustrated when they looked at a map and the information was still wrong," Humora says.

This problem was particularly evident with jurisdictional information. "La Mesa boundaries are all over the place," says Humora. When dealing with storm drain issues, for example, "open vegetative channels are tricky because it's one channel but responsibility may be shared by the state, the city, and private homeowners." Rather than having to go through technicians to obtain maps with ownership details, Humora wanted workers to be able to get the information in the field and update it on the spot.

Cartegraph OMS allows field crews to do just that with user-friendly iPad tablets. This setup enables a seamless transition from the legacy system by tying existing data to a location-based platform and bringing the power of ArcGIS and Cartegraph to the field. These were strong selling points to get budget approval from decision makers, says Humora.

La Mesa is migrating nine asset categories to Cartegraph OMS, starting with the building maintenance and wastewater/stormwater groups. The first step was training and implementation. "Our Cartegraph implementation specialist was the key to the whole thing. He understood our vision, helped us implement it, and instilled confidence in our team."

Part of the training process was making sure field crews felt comfortable with the software. "We brought all the crews in for training so they saw from day one what they were going to be dealing with," says Humora. "During implementation we could see how quickly people were able to pick up the iPads. The interface is very intuitive. Most of the crew was comfortable using it within 1-2 days."

As Humora sees it, every public works department needs a technology-based operations management system. "If you don't have one you're behind the curve," he says. "We have a half-billion dollars' worth of infrastructure in La Mesa and one of my main responsibilities is to protect that investment. I need to be able to know what condition it's in and what needs to be repaired. Cartegraph OMS is the best tool yet to be able to do that."

Benefits La Mesa, California realized by using Cartegraph OMS and Esri:

Accurate information. With Cartegraph and ArcGIS capabilities on the iPads, workers can query any asset to view location data, scheduled maintenance, and ownership. They can also update the database with the tap of a finger. "Your most knowledgeable people are your people in the field. They know what's out there; they know who it belongs to; they have the intellectual history," says Humora. "To give them the power to update the information in the field is a really helpful and useful way to update our information."

Efficient Field Data Collection. Humora says workers appreciate being entrusted with the mobile technology. "They've really jumped on to that. They're very supportive and excited that they get to use the iPads—and that the information is much easier for them to process and put in. I think they actually think it helps them do their job better."

Improved workflow. La Mesa has found that Cartegraph OMS facilitates work planning and improves workflow. Administrative staff will enter tasks such as pipes that need to be cleaned or inspections that need to be conducted. Field professionals can add notes as they perform the work. If they finish early, they can move to the next task; and if they miss something, they can easily to go back and pick up where they left off.

Eliminating paperwork. The building maintenance team is the first group to start replacing paper time cards with electronic activity reporting. When they finish a task in the field, they enter their hours for that task, which frees up time previously spent filling out forms. Other departments are expected to follow suit.

Secure data hosting. As part of the transition to Cartegraph OMS, La Mesa chose to move its database from its local server to Cartegraph's hosted server, which also handles software updates. Keeping up with updates locally was a challenge for the IT department, which serves all city departments. "We were often two or three versions behind," says Humora. "Now data and mapping are seamlessly stored externally."

Want to learn how you can implement ArcGIS and Cartegraph OMS in your organization? Email sales@cartegraph.com or call 800.688.2656 ext. 5297.

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the Clean Ambassadors' cleaning routes, the auditors walked downtown six times a day at specific intervals over a period of three days to collect litter data. When they spotted litter, they photographed it; geotagged the location; and used the app's quick-select menu to categorize it as paper, cigarette butts, containers, bottles, cans, food, or cardboard, for example.

The GIS team then used ArcGIS Online to create visualizations of the litter audit data that could be displayed in Operations Dashboard for ArcGIS. Heat maps provided a clear picture of litter density and the types of litter found most frequently downtown (which were cigarette butts, followed by litter associated with food consumption). The task force used the reports to determine where litter is an issue and developed recommendations and plans for reducing litter in these areas.

The Parks, Recreation and Cultural Resources department presented the Raleigh City Council with a detailed report of the task force's findings, along with budget planning options for addressing litter control and cleanliness in downtown Raleigh.

Growing Cities as Smart Cities

The department continues to use Litter Reporter every quarter to monitor trends and figure out how to efficiently manage litter downtown. Supplemental audits follow the same methodology, routes, and times as the first audit to ensure that the city is monitoring accurate trends. "In general, there is a lot of information and buzz around smart cities and how cities are utilizing technology," said Anderson. "The litter application is an example of how quickly the tools can be deployed to help cities gather data and make informed, smart decisions about how they deliver service. The process is an excellent model for understanding challenges faced by growing cities." ArcGIS—and especially AppStudio for ArcGIS—allowed the GIS team to collaborate deftly with the task force, providing its members with the tools they needed to gather data quickly and create actionable reports. Staff at the City of Raleigh will continue to use data and reports from the litter audit app to work cross-departmentally with DRA to evaluate options for increased levels of service downtown.

For more information, contact the City of Raleigh's web and GIS manager, Jim Alberque, at 919-996-2520.

City of New Orleans—Outbreak Surveillance and Control

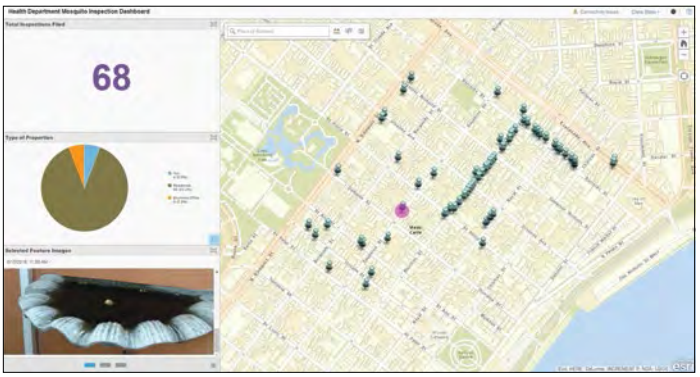
The City of New Orleans, Louisiana (NOLA), enlisted Esri partner GISinc to develop a more efficient data collection process that fieldworkers could use to help the city prevent a Zika virus outbreak. As part of taking on a task this large, NOLA recruited 183 health corps volunteers to inspect all properties in the city, looking for risk factors pertaining to the presence of adult mosquitos and larvae such as containers, standing water, and abandoned tires. During the business process review, the team from GISinc identified how the completely paper-based method to be used by volunteers would require duplicate data entry when consolidating inspections. This manual process would cost valuable time and delay the results being communicated to departments such as mosquito control, code enforcement, and sanitation.

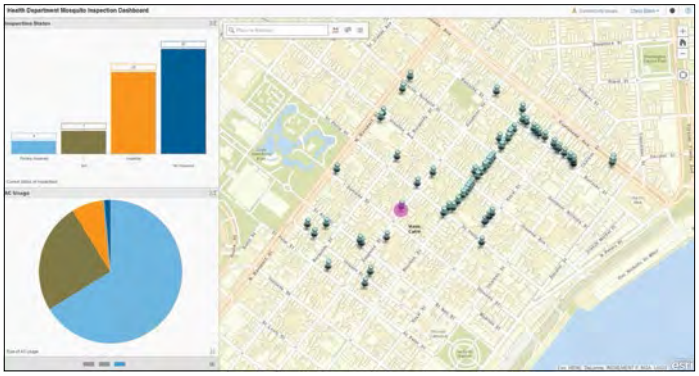
NOLA, having Esri's ArcGIS Online platform, had access to hundreds of ready-to-go apps. GISinc worked with the city to configure two of these apps: Collector for ArcGIS, for conducting field risk inspections, and Operations Dashboard for ArcGIS for disseminating results to key decision-makers and department leads. Within two weeks, after three test runs and feedback cycles, the city had production-ready solutions prepared for the health corps volunteers. As the volunteers' inspections are completed in the field, results are disseminated in real time on an operational dashboard.

What makes this outbreak surveillance and control solution remarkable is that the configurable apps can be repurposed to combat all vector-borne diseases. It is Zika virus today, but the concept applies to dengue, chikungunya, West Nile, and other viruses.

The City of New Orleans now has the ability to make decisions based on constant, real-time data and is able to share information with people who need it immediately.

↓ The Inspection Dashboard displays a count of field inspections and a pie chart showing the types of properties inspected in the current map view, and also images taken during the select inspection record. This data updates automatically as inspections are conducted.





↑ Dashboard viewers can click on the bars for each status type and highlight the inspections with their current status. One particular piece of information collected was whether a property was using air conditioning and if so, the type of air conditioning being used.

What's Next for New Orleans and GISinc?

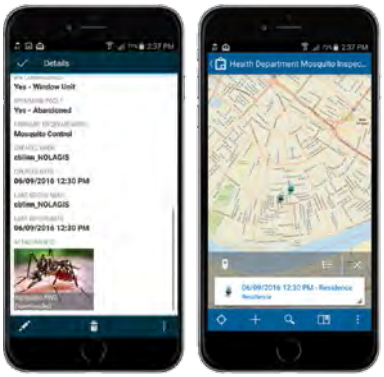
GISinc is currently finalizing its business process report, which has identified multiple Esri ArcGIS Online information products to support all aspects of the city's Zika virus response plan. This includes solutions for surveillance and monitoring activities, control and treatment, and outreach and education.

Location technology can help. The power of visualizing information on a map leads to location-based decision-making.

What the City of New Orleans Is Using for Outbreak Surveillance and Control

- Data services—Data layer creation
- Web map creation—Collector app
- ArcGIS Online applications—Operations Dashboard
- Video instruction and knowledge transfer

To learn more about the work the City of New Orleans and GISinc are doing together, contact Kevin Stewart, GISinc managing partner, State & Local Governments at kevin.stewart@gisinc.com.



← Field crews took advantage of ArcGIS Online technology and the Collector for ArcGIS mobile application to conduct the inspection process throughout the city. The image shows the types of information being collected and how users can easily add items such as pictures taken from their mobile device.

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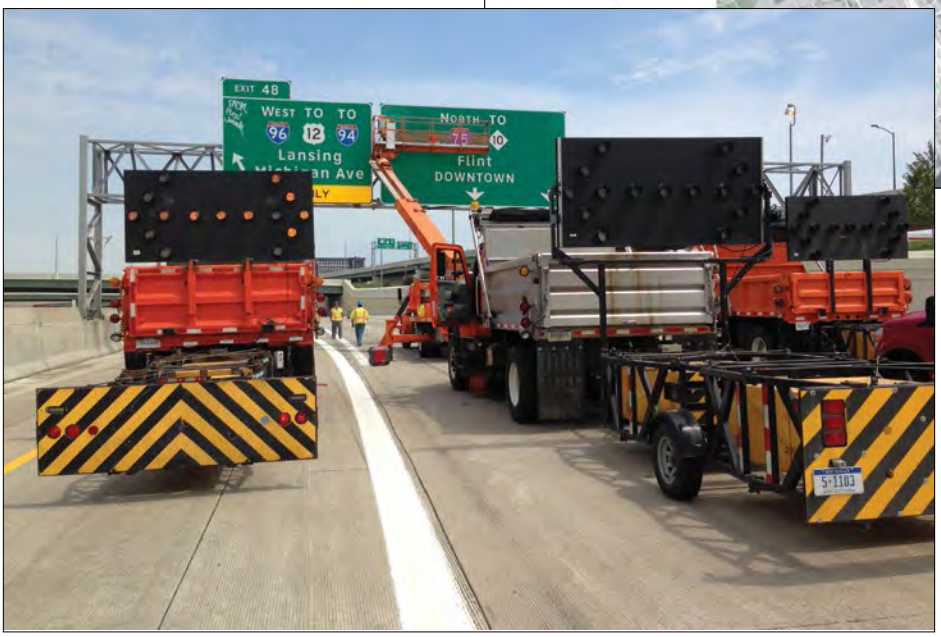
Detroit Area Graffiti Project

Detroit has long been built on a bedrock of creativity. From music such as Motown and Electronic to artists and architects such as Diego Rivera and Albert Kahn, the creative spirit of Detroit seems to continually rise above every challenge it faces. One recent challenge that has faced Detroit was the rise of unwanted graffiti or tags on public infrastructure. While the city of Detroit has its own unique challenges when it comes to managing unwanted tags, the Michigan Department of Transportation (MDOT) also faces a similar challenge along its freeway system in Metro Detroit. Graffiti along roadside assets such as abutment walls, concrete and steel bridge beams, and pump stations has long been an issue for MDOT. However, beginning in the summer of 2012 through 2013 the taggers moved from their typical spots to more precarious locations; overhead signs. These signs, mounted on bridges or trusses, are typically 15 feet off the ground above live traffic. At the peak of the crisis, over 90 overhead signs were tagged along the Metro Detroit freeways creating unsafe and distracting driving conditions. With increases in citizen complaints and political pressure, the tagging problem became a hot-topic in MDOT's Metro Detroit offices. MDOT Maintenance need to find a way to efficiently clean the signs in high traffic volume roadways.

Around the same time that the Metro Detroit office was looking for a solution to this problem, MDOT's central GIS team was testing the use of ArcGIS Online and specifically the Collector for ArcGIS mobile app. The central GIS team decided to take on the project as a pilot. The ability to easily collect a tagged location with a set of basic attribution and a photo convinced the team that ArcGIS Online and Collector would facilitate the end goal of getting the tagged signs cleaned.

The ArcGIS Online Graffiti Pilot began to take shape and the team set three goals for the project:

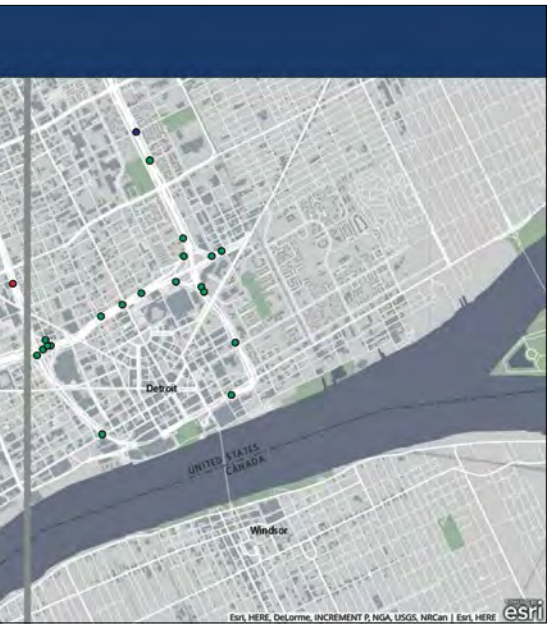
1. Planning and streamlining all cleaning efforts across offices & garages to manage graffiti.
2. Reporting tool for management and outside agencies.
3. Gain experience using an innovative technology (ArcGIS Online and Collector).



After six months of foundation building, the maintenance staff at MDOT began cleaning in the summer of 2014. Mobile data collection of the tagged sign locations, basic attributes, and a photo were collected using the Collector for ArcGIS app on iOS devices (phones, and tablets). A first pass of the freeways created the initial dataset and MDOT staff collected additional locations as they were identified by staff or through citizen complaints.

Supplementing attribute collection with a photo proved to be an invaluable addition that highlighted the power of mobile data collection. The photos attached to the spatial location of each sign allowed the team to plan accordingly for cleaning operations and efficiently use traffic control devices and staging. In addition, adding a live service of MDOT's lane closure data from its 511 site made it possible to locate planned lane closures and take advantage of already scheduled roadwork.

The seemingly unsurmountable project resulted in 76 cleaned signs over a total of 35 cleaning days. For the maintenance team, the use of ArcGIS Online and Collector created a common data format, language, and discipline around the project. In addition to MDOT maintenance staff, upper management were able to realize the benefits of ArcGIS Online through Operations Dashboard status updates during the project. Local and state law enforcement became aware of the project and partnered with MDOT in order to share data on location, dates, and photos of tagged signs to aid on the apprehension and prosecution of taggers.



↑ With map views from ArcGIS Online, an overview of new tag locations, hot spot concentrations, and cleaning operations could be easily managed.

Near the end of the project, MDOT noticed that signs were no longer being tagged and the pilot project unofficially came to an end in early 2015. The data and experience with Collector however, still prove to be invaluable resources to maintenance staff today. Shortly after the project's completion, staff used the data to manage the installation of climbing deterrents on trusses and used the same methodology for replacing 30 of the worst signs where graffiti and cleaning damage was too severe. Last of all, the pilot became a foundation for a new Performance Based Graffiti Cleaning contract for the Region utilizing ArcGIS products that allow MDOT staff to collect, monitor, and manage the cleaning contract based on response time.

The new contract is a testament to the success of the Collector and ArcGIS Online pilot and has provided the basis for a number of other maintenance activities that now take advantage of the same innovative technology. Sticking with that tradition and using Esri's ArcGIS Online products, MDOT found an innovative solution to a rising graffiti problem in Detroit and overcame it.

↑ Reports from the Operations Dashboard were used to communicate with management on the cleaning operation's progress.

Matt Robinson, Transportation Planner, Central GIS, MDOT

Joe Bartus, Senior Transportation Engineer, Metro Detroit, MDOT

LaneClosure&Cleaning

Cleaning operations at large freeway interchanges posed complex traffic needs. MDOT was able to prioritize and coordinate cleaning locations and sign replacements.

TaggedBackofSign

The Collector app allowed obscure tags to be visualized so crews could plan accordingly. Silver paint is applied on back while washing the front.

TaggedTrussSigns

Locations like this posed significant challenges to maintain traffic. By using the photo attachments, the MDOT team could better plan lane closures.

BeforeAndAfterMap

With map views from ArcGIS Online, an overview of new tag locations, hot spot concentrations, and cleaning operations could be easily managed.

Dashboard

Reports from the Operations Dashboard were used to communicate with management on the cleaning operation's progress.

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