Rubicon Helps the City of Harrisonburg Optimize Solid Waste Services Using AWS, Saving 61 Minutes per Route and Improving Worker Safety

Executive Summary

Rubicon, an AWS Partner, helped the City of Harrisonburg, Virginia, implement RUBICONSmartCity to save waste pickup drivers 61 minutes per route, improve vehicle maintenance, and increase driver safety. RUBICONSmartCity is a smart waste and recycling software solution that runs on AWS services including Amazon RDS and Amazon S3.

Seeking More-Efficient, Cost-Effective Waste Services

Harrisonburg is a growing city of more than 53,000 people located in Virginia's Shenandoah Valley. The city's busy waste department, part of its Public Works Department, serves citizens throughout the city, using a fleet of trucks to collect refuse every day. However, the department lacked established driving routes, relying instead on a "flock" approach that often created longer routes and negatively impacted resident services. "There were a lot of inconsistencies with the service, and we'd regularly receive dozens of complaints every morning about missed pickups or other issues," says Harsit Patel, support services manager for the City of Harrisonburg.

Service problems were not the only issue. The city was also concerned about fuel costs and worker safety. "We knew we were wasting a lot of fuel every day because trucks were driving longer routes and sometimes going back to a house if they missed it the first time," Patel says. "Since our drivers and field crews were out longer, there was a higher risk of injury." Although the city was using telematics devices on trucks to monitor vehicle location, idling, and diagnostic codes, the devices did not provide the necessary solid-waste-specific insights, such as digitized routes, route sequencing, and service verification. To increase route efficiency and digitize its paper-based processes for logging trips, the Public Works Department explored a new technology solution. "We always try to improve our efficiency to make things smoother, but we had not found the right technology to fit our needs," says Patel.

Using RUBICONSmartCity on AWS to Digitize and Optimize Driver Routes

The city finally found what it was looking for when it engaged with Rubicon, a Kentucky-based Amazon Web Services (AWS) Partner that provides smart waste and recycling software solutions for global businesses and governments through the RUBICONSmartCity software as a service (SaaS) solution. The solution uses Amazon Relational Database Service (Amazon RDS) and Amazon Simple Storage Service (Amazon S3) for collecting and storing vehicle data, and it implements an Internet of Things (IoT)–enabled waste collection fleet. "We chose AWS as our cloud technology provider and partner because of its market leadership and unparalleled security and flexibility," says Phil Rodoni, chief technology officer at Rubicon.

Rubicon is also a participant in the AWS Smart Cities Pilot Program, through which AWS supports partners in their creation of innovative, strategic smart cities solutions. By participating in the program, Rubicon received AWS support to build leads, run campaigns, and develop its solutions.

Rubicon worked with the City of Harrisonburg to digitize and optimize driver routes by giving each driver a smartphone preloaded with an in-cab interface (ICI) that monitors vehicle location, route completion, and service verifications in real time. The ICI also provides weight ticket logging and the ability for drivers to relay problems as they find them along their route and, if needed, assist other drivers with unfinished routes.

All information is sent to a secure portal for supervisors and dispatchers to evaluate and assess any issues. Drivers log out of their routes and return the ICIs to a charging station at the end of the day. "Utilizing the city's vehicle breadcrumb trails, as well as input from the

city, our Customer Success team manually created digital routes—and every address that is serviced on those routes—and uploaded it to Rubicon's portal," says Fred Hannon, director of customer success at Rubicon. "In collaboration with the Harrisonburg team, Rubicon used the portal to create, label, and digitize all 20 recurring residential routes. Digitization was the initial step toward a more efficient solid waste operation. Once routes were digitized, the focus then turned to the best way to run them."

Saving 61 Minutes per Route

By using RUBICONSmartCity to digitize all city refuse routes, Harrisonburg is saving up to 61 minutes of drive time for each route. "Our drivers aren't wasting time anymore because our overall processes are much more efficient and we have better route visibility with the Rubicon solution on AWS," says Patel. "The trucks have their own individual routes, and they all finish close to the same time. And drivers who finish earlier can go assist others in completing their routes."

When comparing route time and mileage a year after the RUBICONSmartCity deployment, the city's route times were on average more than one hour shorter in residential operations, down from an average of 351 minutes per route to 290 minutes per route. Similarly, route mileage has been almost cut in half, from an average of 63 miles per route down to 33 miles per route. These reductions in route duration and mileage translate to more than $194,900 in annual savings. In addition, the reduced mileage accounts for approximately 230,000 pounds of CO_2 emissions avoided, or the equivalent to taking 20 passenger vehicles off the road each year.

Improving Vehicle Maintenance through Diagnostics

Harrisonburg is using RUBICONSmartCity to monitor and report vehicle fault codes, which gives the city truck diagnostic data that wasn't previously available. Armed with this data, fleet administrators can quickly identify vehicles with flagged issues from pre- or post-inspections and then implement preventative maintenance through custom reminders and notifications. "With the diagnostic data we're receiving through the Rubicon solution, we can lower the risk of our vehicles breaking down on their routes," says Patel. "We have more accurate reporting on our vehicles, and that helps us be proactive about maintenance for vehicles that can each cost over $165,000."

Keeping Workers Safe on the Job

Because of the increased efficiency of its waste operations, Harrisonburg can ensure safer working conditions for its employees. "We are committed to worker safety, and RUBICONSmartCity is helping us keep our employees safer by reducing route times so they're not working too much," Patel says. "We've seen our workers' compensation claims from sanitation employees cut in half, and that's important to us. We want our longtime employees to feel better about retiring, knowing they're not going to face a lot of injuries before that time."

The City of Harrisonburg is currently working on a route optimization project to further reduce mileage, lower service time, and balance workloads equitably among drivers. "We anticipate allocating our staff more efficiently and driving additional cost savings by continuing to optimize," says Patel.

About Rubicon

Rubicon is a leading provider of cloud-based waste and recycling solutions for businesses, governments, and organizations worldwide. An AWS Partner, Rubicon has more than 8 million service locations and focuses on developing software solutions that bring new transparency to the waste and recycling industry.

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