INDUSTRY:
Government

AGENCY:
City of Aurora, Colorado
Department of Public Works

CHALLENGES:
- Increase productivity and accountability among municipal vehicle operators.
- Track vehicle locations in real time for more efficient dispatching.
- Respond to public requests and weather-related events faster.
- Reduce the application of road chemicals and their associated costs.

RESULTS:
- Worker productivity and efficiency greatly increased.
- Off-route incidents reduced.
- Cut the use of road chemicals in half—an annual savings of over $200,000.
- Reduced cost of new system implementation compared to the previous system.
- Increased coverage and capability compared to the previous system.
- Improved public satisfaction due to efficient dispatching and routing.

Keeping roads clear and costs down with a wireless fleet management solution.

The City of Aurora Public Works Department is responsible for maintaining more than 850 miles of municipal roads and streets in the third largest city in Colorado. Located 14 miles east of Denver and only five miles south of the Denver International Airport, the City of Aurora has its work cut out for it with seasonal snow removal and year-round road maintenance and street sweeping.

The city has a fleet of 61 vehicles including 32 spreaders/snowplows, 15 sprayers, and 14 sweepers. Vehicle costs alone can put a large burden on a small city like Aurora. "We spend an average of $13,000 a year just to maintain trucks and $18,000 a year on sweepers," said Lynne Center, Project Engineer for the City of Aurora.

When you add the expense of personnel and more than $1 million a year for chemicals like anti-icing agents, it's easy to see why a municipal agency like the Public Works department would seek an automated system to help optimize their productivity and efficiency.

"We realized that a wireless solution was the most cost-effective and the simplest to implement," said Center. "Real-time or near real-time data is crucial."

A system that's more than the sum of its parts.

AT&T Wireless has worked closely with the City of Aurora since 1998 and was able to provide them with a uniquely affordable and effective wireless solution.

The backbone of Aurora's fleet management system is the AT&T Wireless GSM™/GPRS network. This national data network provides broader coverage and access speeds two to three times greater than the CDPD network (an earlier generation of the AT&T Wireless network). Other important components of the solution include software from CompassCom, which integrates with the city's GIS (Geographical Information System), and the Sierra Wireless MP 750 Rugged Wireless modem which includes GPS (Global Positioning System).

The system provides accurate, up-to-the-minute data on the activities and whereabouts of the vehicles in the fleet. This data allows supervisors to manage the performance of individual vehicles and the productivity of drivers. Material usage and fuel costs are also closely monitored and controlled.

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Lynne Center
Project Engineer
City of Aurora

The data also allows department dispatchers to direct vehicles immediately to the streets where they are needed. Dispatchers can view the status and location of every vehicle in real time, re-routing vehicles for emergency situations as they arise. City personnel can also replay dispatch scenarios and storm events for analysis and procedure improvement.

Overall, the city was able to realize significant savings, greatly increase productivity, and achieve more timely and informative communication with the public.

Implementation and operational costs reduced.

The cost savings associated with the new tracking system are substantial. The city typically spends $1 million a year on road chemicals. Since the new system allows for much more precision in the delivery of expensive chemicals, the city was able to cut the application rate in half this past winter. "By cutting our application rate in half, we saved over $200,000 last year," explained Center. The city looks forward to even greater savings in this area as the rollout expands.

The city also saw substantial savings on hardware costs. Their old CDPD modems cost $3,500 each, while the new Sierra Wireless GSM™/GPRS MP750 modems cost only $1,000 each.

The city has also seen a reduction in their network access charges. With the old CDPD system, they paid about $65 per month per vehicle. But with the new GSM™/GPRS network, the vehicles share a pool of megabytes. Each vehicle uses only what it needs and the city saves money.

"AT&T Wireless and its GSM™/GPRS network have reduced our monthly costs to approximately $40 per vehicle per month," said Center. "We expect the savings to grow as we continue the rollout."

Aurora now tracks its street sweepers wirelessly as they clean 850 miles of roads.

Better information leads to better productivity.

The most noticeable and most immediate improvement the City of Aurora saw with the new tracking system was in the productivity of its workers.

"We needed a system that could automatically log route information and vehicle status and independently verify that sweepers and snowplows were doing what they were supposed to be doing."

Lynne Center

Previously, tracking drivers' activities and productivity proved challenging. Drivers' logs were the only sources of information. "The drivers would have to call or radio into a supervisor or dispatch center to report completed routes," said Center. "We needed a system that could automatically log route information and vehicle status and independently verify that sweepers and snowplows were doing what they were supposed to be doing," said Center.

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Lynne Center

Now, there's almost no limit to the information they can capture and analyze, including:

- Vehicle speeds.
- Addresses where vehicles stopped.
- How long a vehicle stopped at any location.
- Where the vehicle was at any point in time.
- How long it takes to fill a vehicle with water or chemicals.
- Broom and plow position.
- Spreader and sprayer function.

Naturally, the increased flow of timely information encourages greater accountability and has resulted in improved worker productivity. "The software allows us to generate reports of time and distance the vehicles and sensors were operating and can report the vehicle location by street address," explained Center.

Drivers' performance is tied directly to their pay. When they see increased productivity affecting their income positively, both their support for the system and their job satisfaction improve.

In addition, the city was able to document a 15% increase in the productivity of sweepers. "Since implementing the solution, we've been able to slightly increase our work force without hiring new supervisors," said Center.

Public reaction is positive.

The public reaction to the new tracking system has been very positive. "It helps us dispel the negative image of public works departments," explained Center. "The people of Aurora have been able to see the improved responsiveness for themselves."

During a storm last March, a woman called to say that she hadn't seen a city

Driver productivity has risen sharply since implementation of the new AT&T Wireless system.

snowplow all day. With the new system, the department established that a city truck had, in fact, visited her street that day. According to Center, "When the citizen asked, 'How do you know that?' we said we have this tracking system. She was blown away!"

Local politicians have also accepted the new system and its many benefits. City council members have been very supportive of the system and consistently approve funding to improve or expand the system.

An invaluable collaboration with AT&T Wireless.

By early 2003, when the CDPD network was being phased out, AT&T Wireless stepped forward to take the lead in building an even better solution.

"AT&T Wireless has been very proactive. They've helped with technical issues, worked with our IT people, and even assisted us with our RFP. In fact, the RFP stipulated that any proposed system must be compatible with the AT&T Wireless network," said Center. "We've had an excellent ongoing relationship with AT&T Wireless since 1998. We've found their service to be reliable and the network completely covers the areas we need."

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Room for expansion.

The City of Aurora looks forward to expanding the system to all of its vehicles in the near future. "We also want to implement a mobile AVL solution for our supervisors," explained Center. "We hope to be able to take advantage of the data network to provide in-vehicle Internet access to reduce the time our supervisors have to spend in the office."

Other departments in the city are looking into deploying a similar system. Now that the Public Works department has the system in place, they are able to show other departments the benefits of the system and even help minimize the expense.

Expectations exceeded.

Center has only positive comments on AT&T Wireless and the solution they provided. "The entire process of developing and rolling out the new system has been essentially trouble-free," said Center. "We've had no bad modems. We've never lost access to the network. Our coverage is better than we had with CDPD, and we haven't experienced any drop-offs.

Wireless tracking allows residents to find out exactly when their streets will be cleared.

"We get deliveries from AT&T Wireless very quickly, always in two to three weeks. Our questions have always been answered quickly, usually on the spot and rarely in more than two to three hours.

"The solution has exceeded our expectations," said Center.

For more information, contact your AT&T Wireless Account Representative or visit **attwireless.com**.

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