



WebTech Wireless Helps Keep Chicago Neighborhoods Clean

A Case Study: City of Chicago Department of Streets and Sanitation

Highlights

Industry

- City Government

Fleet Size

- 2,500 vehicles city-wide by all departments
- 1,600 vehicles with Dept. of Streets and Sanitation

Organizational Needs

- Locate and track vehicles
- Increase worker efficiency and productivity
- Enhance service to Chicago constituents

WebTech Wireless' Quadrant™ Solution

- WT5000 Locators™ (primarily)
- Quadrant™ software used by supervisors



The Situation: A Major City

As one of the world's largest metropolises, and the United States' third largest city at close to 9.8 million residents, Chicago is known around the world for its cosmopolitan lifestyle, quality of life and variety and vibrancy of its many neighborhoods. Its place on the shores of Lake Michigan has historically positioned it as the gateway to the Midwest, and it remains one of the United States' most important business and transportation hubs.



The City of Chicago's government is comprised of fifty-four departments, delivering services to fifty administrative wards – an area covering approximately 10,874 sq mi (28,163 km²). The Department of Streets and Sanitation is perhaps its most visible, as it's responsible for many of the services city residents depend on every day, such as waste disposal, street lighting, traffic signaling and winter snow removal.

The Department operates one of the city's largest vehicle fleets with a total of 1,600 vehicles of all types, and the city's largest fleet of heavy-duty vehicles. The Department of Streets and Sanitation itself is organized into four major Bureaus, here with their approximate number of vehicles:

- Bureau of Sanitation (600 refuse, 355 recycling)
- Bureau of Street Operations (400)
- Bureau of Forestry (80)
- Bureau of Electricity (65)
- Supervisory and Maintenance (100)

The Department employs more than 3,200 people with close to 3,000 involved in the operation of some type of vehicle, so it's accurate to say that this is a department that lives and works on the streets of Chicago.



The Challenge: Beyond Vehicle Tracking

The City of Chicago first looked into GPS fleet management systems in the late 90s, and though its first experiences were mixed, it was clear that even basic vehicle tracking could lead to improved efficiency, reduced costs, and enhanced service delivery to city residents.

According to Helen Rane Carbone, Chief Programmer and Analyst for the City's Department of Transportation, "Interest in GPS vehicle tracking increased after September 11, 2001 as a response to concerns over security and emergency preparedness. It's still suitable for this role, but its use as a fleet management tool emerged as emphasis shifted towards improving performance and reducing costs."

"Before GPS, our managers and dispatchers had virtually no real-time information on the whereabouts or activity of our vehicles. We relied on very basic communication using two-way radios and written reports and these could never provide the type and depth of information needed for real performance monitoring, improvement, and accountability, which is expected of all city departments."

"We chose WebTech Wireless because their technology was superior to anything else we evaluated, and very cutting edge."

Helen Rane Carbone
Dept. of Transportation
City of Chicago

In 2003, after an exhaustive selection process, the City of Chicago's Department of Streets and Sanitation became a WebTech Wireless customer with the installation of WebTech WT4000 Locators in a number of the Department's snow plows and dump-trucks. This included considerable customization to use the city's existing map data and integrate with the city's fleet management system (CMAT), as well as WebTech Wireless' web-based, Quadrant™ system – which provides greater reporting and data manipulation capabilities for administrators and planners.



The implementation (covered in a companion snow removal case study) was very successful, so naturally the Department looked at its other bureaus to determine which could benefit from a WebTech Wireless solution.

The obvious target was the Bureau of Sanitation (the Department's largest single fleet) responsible for citywide garbage and refuse collection. It relies on a fleet of 600 city owned and operated waste disposal trucks, and 355 recycling trucks, working round-the-clock to keep Chicago's neighborhoods clean. Like the Department's snow plows, the majority of these vehicles are operated by multiple drivers working in shifts, and following complex daily routes.

Simply keeping track of all of these mobile resources from a dispatch perspective (vehicle and driver scheduling, routing, call response, location in the case of emergencies, etc.) was a very real, daily challenge – measuring on-the-street productivity and efficiency of the fleet, a virtual impossibility.

The Solution: Innovative Asset Management with Telematics

The Department began outfitting refuse trucks with WebTech WT5000 Locators in June 2006. The goal was to not only improve dispatch's ability to track, monitor and communicate with drivers, which the Department already had experience doing with its snow plows, but to also provide fleet managers with information to: determine if vehicles and crews were well suited and sufficient for a particular area; know how well crews were collecting waste from specific areas; begin establishing productivity benchmarks; and identify areas where collection problems existed.



Locators transmit real-time location data to dispatch via cell phone mobile networks (GPRS). The Locator transmits this data every 30 seconds and whenever the vehicle makes a turn (configurable by the Department). This gives senior managers such as Gregory De Weese, Member of the Department's IT Strategic Committee, a very accurate

picture of how much time a vehicle spends in a defined area, which can be an entire neighborhood, individual street or alley, or a single location such as a large business. By comparing that against historical data for the same route and/or established benchmarks, managers can track productivity and address concerns in particular areas.

One area where the Department has gained new and unexpected insight is the relationship between crew performance and the number and condition of the Department's waste carts. These city assets sometimes go missing, are damaged, or for various reasons, become inadequate for the needs of an area. When crews consistently spend more time in an area than is considered normal, it can indicate that there are problems with the waste carts. A supervisor can then be dispatched to investigate and remedy the situation.



WebTech Locators also allow for the setting of 'geofences' (virtual geographic boundaries) that immediately alert dispatchers when vehicles are entering or leaving specified areas such as the Department's numerous yards. Again, time spent in these areas can be accurately monitored to determine if there are operational productivity gains that could be made or if problems have arisen.

All of this information is available in real-time – vital for dispatchers – however, for managers like Gregory De Weese, the real value of the WebTech Wireless Quadrant solution is in the wide variety of standard and customizable reports. "Though you might not think it, the system's reports quickly point out when something isn't right, and we can act on it quickly by sending out a ward supervisor to that exact location. This is something we had no way of doing before, as we only had driver reports to go on. This didn't work because crews really have no way of comparing themselves against other crews, and naturally they're focused on completing their routes quickly, with little time for paperwork."

Another way the WebTech Wireless solution has helped the city is with vehicles that serve multiple roles within and between departments. According to De Weese, "Dump trucks typically have multiple uses in construction and maintenance, some waste and refuse removal, and winter snow work. For managers and dispatchers to know where these vehicles are at all times and how they're configured (e.g. plow installed) is very important, especially at critical times such as the winter storm season."

Locator durability was one of the key criteria used in the selection of WebTech Wireless, and according to De Weese, they have performed well. "The life of a refuse truck is pretty tough. They work 24/7, in harsh weather and operating conditions, with constant jolts and vibrations. The Locators have been extremely reliable and we've had very few failures over the years."



Next generation WT7000 Locator now being used in City of Chicago vehicles.

The WebTech Wireless solution has been simple to operate and has been well accepted by drivers, says De Weese. "There was some initial apprehension from employees and unions with regards to workplace monitoring and privacy, but the information obtained is primarily used for workforce productivity measurement and improvement and rarely for employee disciplinary purposes. Once employees and unions understood this, and that the system would make their jobs easier by reducing administrative tasks, then they became more accepting."

When asked about the privacy issue surrounding GPS monitoring, Helen Rane Carbone explained, "Most drivers don't even think about the fact the vehicle they're driving is being tracked, and they comfortably go about their work without feeling they're being watched or controlled. We're really only concerned with very unusual activity or patterns and rarely look at a particular employee."

The Future: Telematics for More Efficient and Greener Cities

Questioned about the future of WebTech Wireless solutions at the Department, De Weese said, "The large amount of data that the system is now providing gives us so much information on what's happening out on the street and we can use it in so many ways. We're working with WebTech Wireless to add more telemetry inputs on our refuse trucks so that we know how often a truck's flipper or compactor is used, the weight of a bucket and the complete truck. This will give us more detailed information on the efficiency of our crews, the condition of our vehicles and waste carts, and generally whether we're meeting a neighborhood's waste collection needs."

This type of application, and others being developed with the Department of Streets and Sanitation, indicates an interest in even more innovative uses of telematics to help cities achieve their environmental initiatives in the near future. Telematics data from waste removal trucks, such as that mentioned, could remotely monitor the volume and weight of waste being collected by area – invaluable information in neighborhood waste reduction programs and for measuring environmental accountability.



Already cities like Chicago are using remote vehicle data to optimize routes, decrease excessive idling and reduce mileage in an effort to reduce fuel consumption and thus CO₂ and noxious emissions. According to Helen Rane Carbone, telematics will play a big part in many of Chicago's environmental initiatives. "Telematics will help us with everything from the number and type of vehicles we're using for a particular task, how they're being used, and the amount of CO₂ they're producing. Everyone is looking to big cities like Chicago to lead the way in this, and remote fleet management has gone from being a useful tool to an absolute necessity."

"I hope to see a day when all of our vehicles are equipped with a WebTech Wireless Quadrant solution."

Gregory De Wesse
Dept. of Streets and Sanitation
City of Chicago



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