



# The Computerworld Honors Program

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## Final Copy of Case Study

**YEAR:**  
*2012*

**STATUS:**  
*Laureate*

**Organization:**  
Chicago Department of Transportation

**Organization URL:**  
[www.cityofchicago.org/](http://www.cityofchicago.org/)

**Project Name:**  
Chicago Traffic Tracker

**What social/humanitarian issue was the project designed to address? What specific metrics did you use to measure the project's success?**

Chicago Traffic Tracker ([www.ChicagoTrafficTracker.com](http://www.ChicagoTrafficTracker.com)) provides accurate and timely information for current traffic conditions on arterials in and around the City of Chicago. With over 4,400 miles of local roads, Chicago is one of the most congested cities in the country. Active monitoring and real-time estimation of traffic conditions are critical for congestion mitigation efforts. While congestion levels on expressways have been monitored for many years by various methods, monitoring traffic conditions on local roadways has been the holy grail of traffic management due to a myriad of factors. Traffic signals, parked vehicles, pedestrians, sheer size of the street network, and exorbitant cost of detection systems have all made it nearly impossible to reliably estimate congestion on city streets. Conversely, real-time traffic congestion information can help to direct traffic away from congested streets, eliminate the uncertainty in travel, and route emergency vehicles via the quickest path -- not to mention the fuel savings, reduced pollution, and less frustrated drivers. With no capital investment the Chicago Department of Transportation (CDOT) developed the application utilizing open source software and existing data feeds.

**Please describe the technologies used and how those technologies were deployed in an innovative way. Also, please include any technical or other challenges that were overcome for the successful implementation of the project.**

Faced with ever crowded streets and limited resources, CDOT's solution to measure traffic conditions on Chicago streets was to develop the technology and algorithm to leverage real-time location data produced by Global Positioning System (GPS) devices onboard transit buses, municipal vehicles and taxi cabs. The GPS devices onboard these vehicles are designed to report back its position and speed every few seconds. While these devices are installed by the fleet owners to assist in operations, CDOT realized that the GPS traces from a large number of probe vehicles received in real time can offer a measure of traffic congestion that can, otherwise, only be gathered through prohibitively expensive methods. Chicago Traffic Tracker processes the GPS traces in real time to develop segment-level speeds. Additionally, CDOT developed a novel concept to easily identify and monitor congested sections in large urban areas after the initial analysis of segment speed showed frequent variations in short time spans. The Traffic Zone Congestion option provides a measure of congestion that travelers can use alongside the individual segment speed to gain a better understanding of conditions that the travelers would experience when they actually travel through the segment. Unlike the individual segment speed, the Traffic Zone Congestion levels remains consistent over time of the day and day of the week, thereby providing a better understanding of expected conditions. Traffic Tracker uses Google Maps API Version 3 for displaying the color-coded segments and traffic zone polygons on the interactive website. The source code for the application and the web display is written in Java and JSP. JavaScript and Web 2.0 technologies like AJAX and JASON are used for seamless integration and display of the updates without page refresh or user action.

**Please list the specific humanitarian benefits the project has yielded so far.**

Since the public release of the beta version in October 2011, the site has attracted tens of thousands of users who regularly check the traffic conditions before they head out to the street. Drivers adjusting their travel times to avoid congested segments and areas of the city help to eliminate congestion buildup and also save significant amounts of fuel. Real-time traffic congestion information can help to direct traffic away from congested streets, eliminate the uncertainty in travel, and route emergency vehicles via the quickest path. Through its use of existing investments to serve a new purpose, Traffic Tracker serves as a model of intergovernmental cooperation and coordination. In addition, Traffic Tracker demonstrates the value of a systems approach to solve multiple transportation needs. Not only does Traffic Tracker provide valuable information to our end users, it can also be used to support more effective transportation system management and operations. Integration with other regional systems offers even greater potential to expand the functions served by Traffic Tracker.

**Please provide the best example of how the project has benefited a specific individual, enterprise or organization. Feel free to include personal quotes from individuals who have directly benefited from the work.**

Please see an article from The Chicago Tribune that highlights the potential benefits of the system. This was not a press release. The newspaper approached CDOT after the beta version was released <http://www.chicagotribune.com/classified/automotive/traffic/ct-met-getting-around-1107-20111107,0,5227590.column>.