



The Missouri Municipal League
2018 INNOVATION AWARD
Cover Sheet

City: City of Brentwood, Missouri

Project/Program Title (no more than five words): Technology to Improve Public Safety

Date Program Began: 6/1/2016

Date Program Completed: Ongoing

Category of Municipality (Check One)

- ☐ Large (more than 15,000)
☒ Medium (5,000 to 15,000)
☐ Small (under 5,000)

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SUBMISSION DEADLINE: Postmarked No Later Than March 2, 2018

Please mail to: 2018 MML Innovation Award
Missouri Municipal League
1727 Southridge Dr.
Jefferson City, Missouri 65109

Or email: rhuckstep@mocities.com

Technology to Improve Public Safety (Services)

Project Summary

In June 2016, the City of Brentwood implemented low-cost GPS (Global Positioning Satellite) tracking devices in all of its public vehicles. The City partnered with Geocompile, LLC to develop a data collection and analysis system to analyze the data from the GPS units. Data from the City's police vehicles was used to manage and improve the delivery of public safety services to the residents. The objective was to improve the regularity and effectiveness of police patrol activity and increase police visibility in residential neighborhoods. Using the Geocompile system, the police chief, law enforcement consultants and the city administrator reviewed nine months of police patrol activity data and developed procedures for improved police patrol effectiveness. They continue to use the Geocompile system to monitor and improve patrol activity. Since implementation, 100% of the City is patrolled on a regular basis, incidents of Type I criminal activity have fallen consistently month over month, at least two major crimes have been stopped in progress, and residents have reported a notable increase in police visibility, particularly in residential neighborhoods. The system was developed for Brentwood, but is completely cloud based and can be easily implemented by any municipality.

Technology to Improve Public Safety (Services)

Project Description

Like most municipalities Brentwood operates its own police force. At any given time, there are 4 or 5 police officers patrolling an area just under two square miles. Approximately one quarter of Brentwood is home to extensive retail business and the remainder is residential neighborhoods. Police complained that the retail areas demanded an inordinate amount of their time and residents complained of low police visibility in residential neighborhoods. Like many other suburban municipalities, Brentwood has a low incidence of violent crime but relatively high incidence of property crimes such as shoplifting and vehicle break-ins. Brentwood needed an effective way to analyze the deployment of its limited police resources.

In June 2016, the City of Brentwood implemented low-cost GPS tracking devices in all of its public vehicles. The GPS units allow the City to track the movements of its vehicles at all times. One of the objectives of implementing the GPS tracking devices was to analyze the City's police patrol activity. The out-of-the-box tracking system provided by the GPS vendor allowed the police management team to "see" police vehicles in real-time. In addition, the vendor system allowed management to track the history of a single vehicle at a time over a limited history. What was lacking was the ability track and analyze the activity of all of the police vehicles over an extended period of time. The system provided by the vendor simply did not provide the ability to perform meaningful, comprehensive, analysis of the City's police patrol activity. The City's research suggested that no other GPS vendor's out-of-the-box system would provide these capabilities either.

The City sought a partner to help it develop a system that would address some of the shortcomings in the vendor's out-of-the-box tracking system. A local software company, Geocompile, LLC, agreed to work with the City to develop such a system. Together, Geocompile and the City developed a method for importing hundreds of thousands of GPS data points into a single database and receiving daily updates from the vendor's GPS tracking system. Having access to the raw data allowed Geocompile and the City to work together to develop a number of cloud based applications specifically developed to address the City's needs. One of the first such applications was a "playback" tool that allows the City's management team to review all of its police patrol activity over any period of time. For example, the police chief and shift commanders can review the movements of all the City's police vehicles from the previous day, the previous week or any particular shift during the previous month. The movements of the vehicles are simultaneously plotted on an easy to read, color coded, Google map (see attachment). In addition, the playback tool allows the chief to vary the speed of the playback (i.e. fast-forward) so he can review an entire shift's patrol activity in just a few minutes.

In addition to the playback tool, the City and Geocompile developed other methods of analyzing historical police patrol data to identify improvements. Heat maps were developed to show the relative concentration of police patrol activity throughout the City. The heat maps identified areas of the City that were not being patrolled regularly (see attachment). The addition of "points of interest" allows the police force management to input an address and track the number of times it has been patrolled over

any period of time (see attachment). This is effective for managing vacation checks, businesses and other particular points of interest as the need arises. Another useful application is the “checkpoint”. Similar to the points of interest, the checkpoint allows the user to enter any address in the City and review the number of times the address has been patrolled by the police in the last 24 hours, week and month. In addition, the checkpoint application allows the user to see the date, time and police vehicle for each patrol and a short animation on a Google map of the patrol activity (see attachment).

The checkpoint application has proven very useful in responding to residents’ questions about how the police have responded to particular threats. For example, recently a resident posted security camera video of a suspect attempting to break into a neighbor’s garage online. The video showed a man in a dark stocking cap trying the garage door at 10:44 p.m. Using the checkpoint application, City management was able to determine that the address had been patrolled just five minutes after the video was taken. In addition, the playback application allowed the City to determine that the police had responded to a report of a suspicious person in a nearby neighborhood about 40 minutes earlier and had fanned out in an effort to identify the suspect. Unfortunately in this case the suspect(s) eluded the police, but the Geocompile system allowed the City to provide residents valuable information about the public safety services provided by the City and specific actions taken by the police.

Using data from the Geocompile system, the police chief, in co-operation with representatives from CPSM and the City Administrator, has developed and implemented new police patrol procedures designed to more effectively patrol all areas of the City. The City’s management team is using the Geocompile system to monitor police patrol activity and ensure that 100% of the City is patrolled on a regular basis. While it is still too soon to quantify the impact of the program, since the new patrol procedures were implemented in June 2017, the City has experienced a consistent month over month decline in Type I criminal incidents (see attachment). In December 2017, Type I criminal activity in Brentwood reached a 3 year low. In addition, the new patrol procedures almost certainly played a vital role in our police stopping two serious crimes in progress; a jewelry store robbery in November 2017 and an attempted rape in December, 2017.

The City’s residents have reported a noticeable increase in police patrol activity in the residential neighborhoods. The increased police visibility combined with the City’s ability to provide specific information regarding police patrol activities has increased the residents’ support for the department and its officers. The evidence is admittedly anecdotal, but the Mayor, police chief and city administrator have all received letters, phone calls, Emails and personal comments from City residents stating that they have noticed the increased police patrol activity and expressing their appreciation for the officers and the department.

The development of the Geocompile system is ongoing. Recently, the City worked with Geocompile to incorporate and synchronize dispatch data into the playback application. This allows the user to see dispatch information synchronized in time to the motion of the vehicles on the map. This allows the police management team to get a more comprehensive picture of what was taking place during the time period being played back. Applications are being developed to analyze the City’s fire services and municipal trash services as well. The cost of the Geocompile system is \$360/vehicle per year for the GPS

units and the annual subscription to the cloud based applications is \$18,000 per year. In 2018 the total budgeted cost for the Brentwood police department is \$26,640.

Heatmap of Typical Monthly Patrol Before Geocompile Project

Samples: 201,547 Active shifts: 339 Active Vehicles: 13

Without Police Department



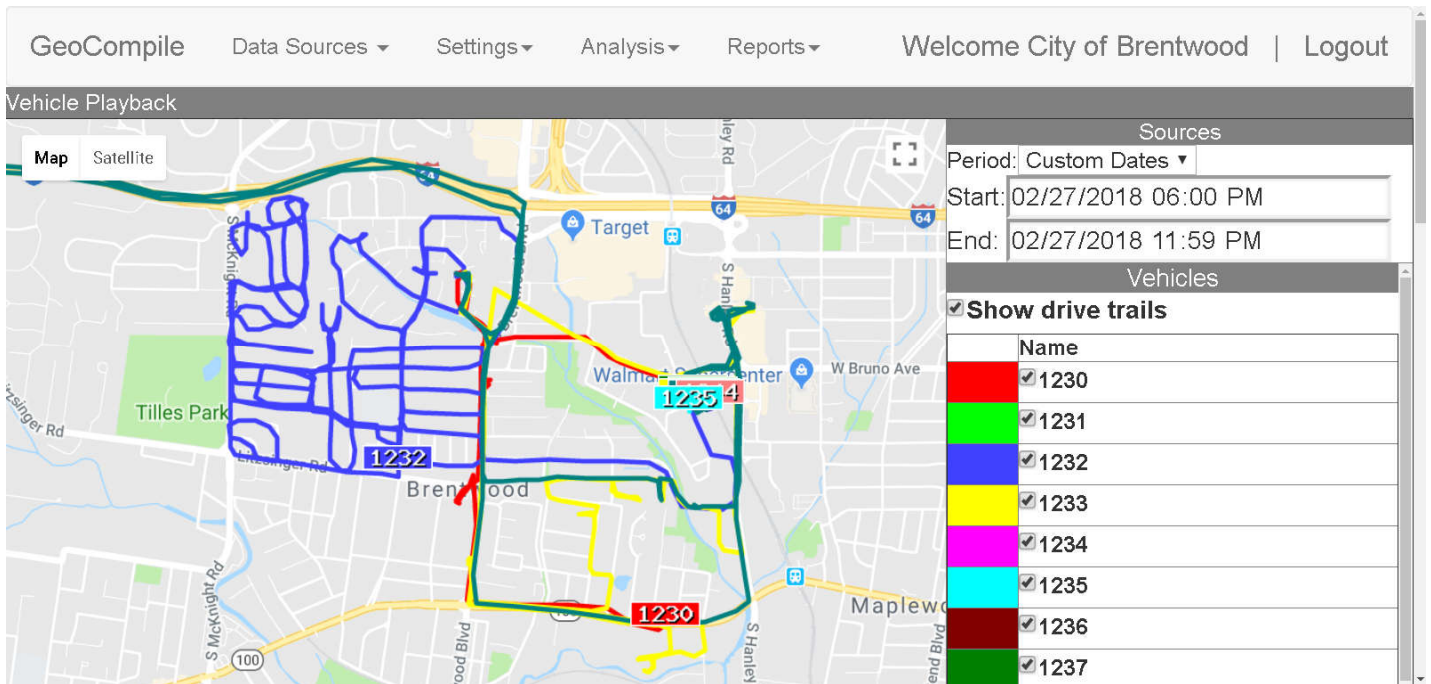
Heatmap of Typical Monthly Patrol After Geocompile Project

Samples: 304,009 Active shifts: 331 Active Vehicles: 13

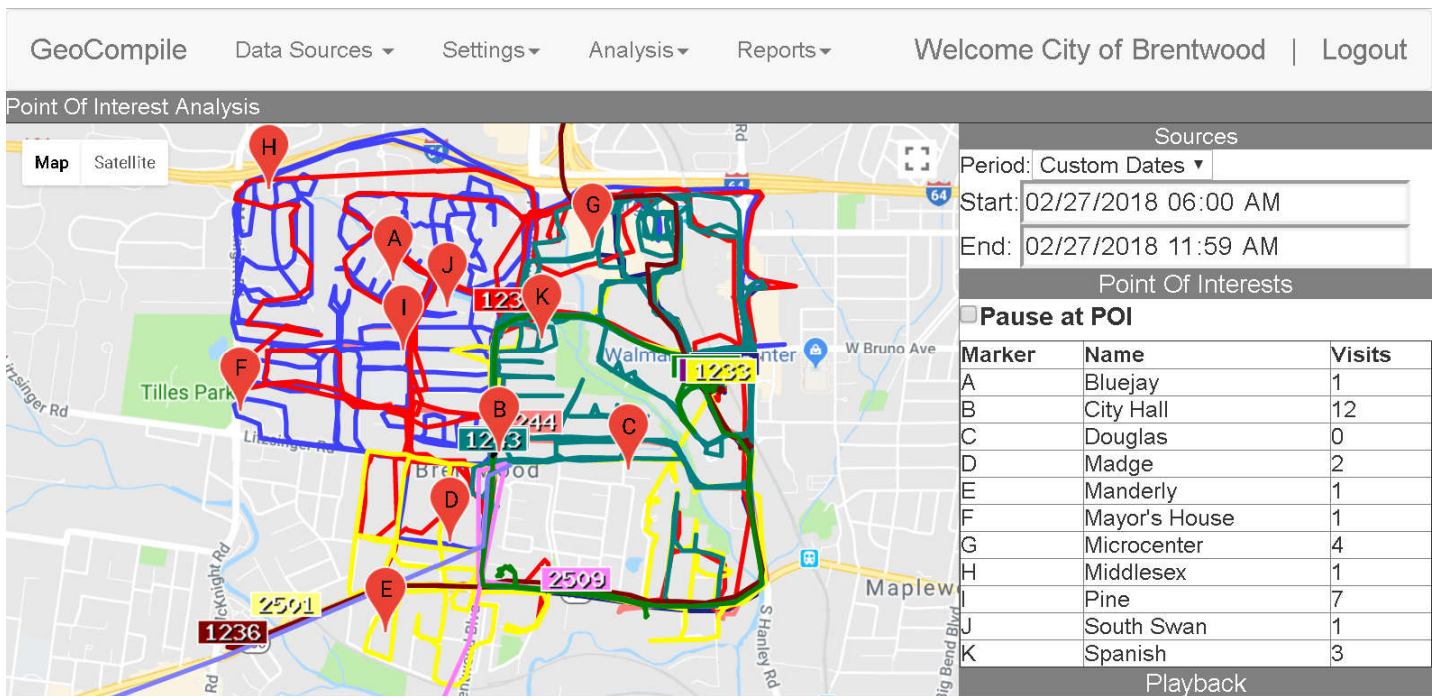
Without Police Department



Geocompile Playback Tool



Geocompile Point of Interest Tool



Geocompile Checkpoint Tool

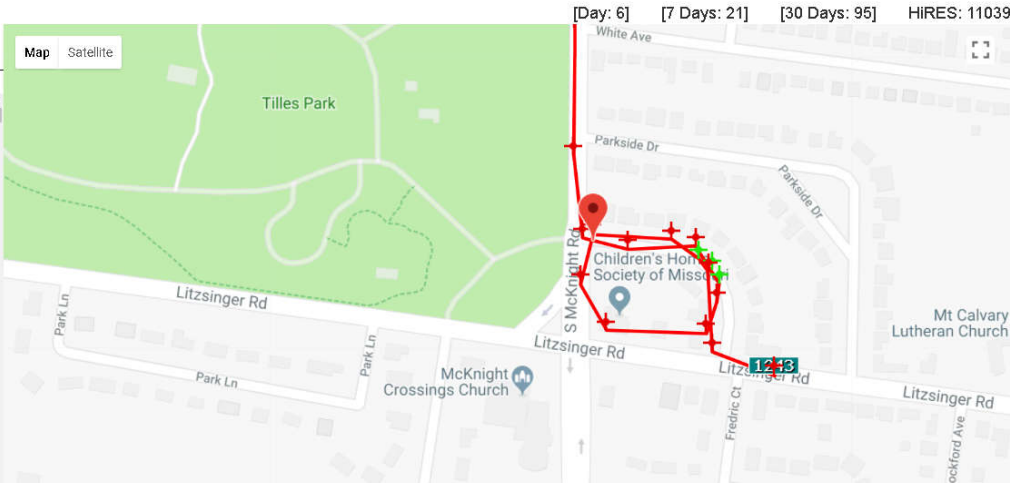
GeoCompile Data Sources ▾ Settings ▾ Analysis ▾ Reports ▾

Welcome City of Brentwood | Logout

Address:

Please click on a row:

Timestamp	Vehicle	
2018-03-01 04:09:06	1244	<input type="button" value="Eval"/>
2018-03-01 01:20:51	1243	<input type="button" value="Eval"/>
2018-03-01 00:11:44	1244	<input type="button" value="Eval"/>
2018-02-28 22:30:06	1243	<input type="button" value="Eval"/>
2018-02-28 18:55:13	1244	<input type="button" value="Eval"/>
2018-02-28 18:43:31	1244	<input type="button" value="Eval"/>
2018-02-28 01:11:59	1233	<input type="button" value="Eval"/>
2018-02-27 10:53:52	1236	<input type="button" value="Eval"/>



Total Type I Crimes

