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*About the Author: Kalen Myers is GIS Analyst for the City of Evans Colorado. She has a bachelor's degree from Temple University in Geography and Urban Studies.*

*Abstract: Traffic accident data is an important decision-making tool for city governments responsible for keeping municipal roadways safe. Engineering departments must have hard data on hand to warrant traffic signals and other traffic calming infrastructure. Thus it is crucial that traffic accident data is up-to-date and in an easy to access format. It was the challenge of the City of Evans GIS department to find a quick and easy solution for inputting over 750 backlogged traffic accident reports. Ultimately ArcGIS Online was used to simplify the tedious process of traffic accident data entry saving valuable time and energy.*

### Accident Mapping in ArcGIS Online: Making the Search Simple

Traffic accident data is valuable to have in GIS. Apart from its visual power to very easily identify unsafe intersections by tracking accident hot-spots, it is also a crucial decision-making tool used by local governments responsible for keeping municipal roadways safe. This is especially true in the small-sized city of Evans, Colorado. Evans is located in one of the nation's fastest growing regions and is facing challenges associated with both internal development and regional growth. With growth comes changes

to traffic patterns and increased pressure on existing infrastructure. Solutions to such issues come from the City's Engineering Department which relies on GIS so that it can make informed decisions about roadway safety.

City residents are a primary source for information about road safety, often calling with questions, concerns and reports about unsafe intersections, visibility issues and missing stop signs. It is the job of the Engineering Department to plan next steps for the identified areas; determining the difference between perceived danger and valid areas of concern. In order to investigate problem areas city staff require hard data to warrant new traffic signals and other traffic calming infrastructure. Such data is collected largely from traffic studies and traffic accident data. GIS serves as a crucial resource in supplying the engineering department with the data they need. With that being said, extracting desired data from traffic accident reports and inputting it into GIS is challenging.

Though traffic accident reports contain a plethora of valuable data about road and weather conditions, property damage, DUI information and more, it takes a lot of decoding to understand. There are thirty sections on Colorado's traffic accident report form and around two hundred fifty associated codes. A code sheet is necessary in order to decode the reports making data entry a time consuming process. Not only does it take time to look from traffic accident report to code sheet and back again many times, but decisions must be made as to what information is most valuable to input into GIS for those using the data, in this case the engineering department.

In a given week it is normal for records specialists at the Police Department to forward up to 15 new accident reports to GIS in the form of PDF's. These reports have no geographic reference other than a written description; meaning they must be manually plotted on a map. Due to staffing changes and other capacity challenges at the City of Evans, traffic accident report management had fallen more than a year behind. For a GIS department of one, tasked with managing data for an entire city, the thought of tackling a growing pile of over 750 traffic accident reports was daunting. A month deadline was set for

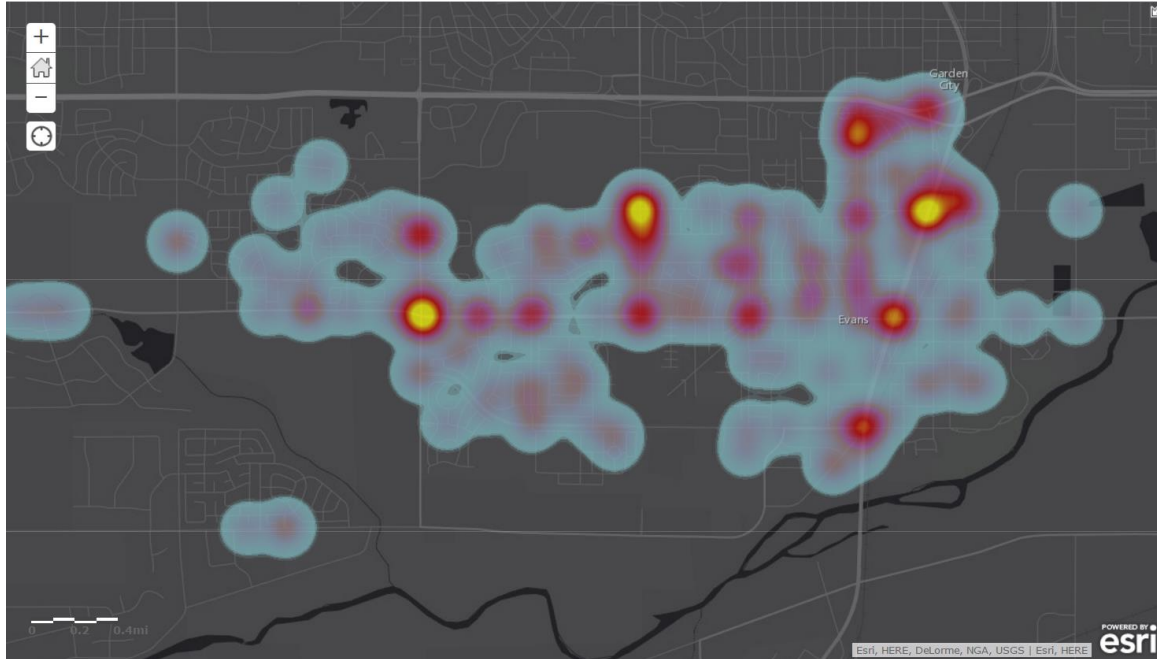
the project which would involve creating a new accident geodatabase and inputting the backlogged traffic accident reports. Fortunately, the GIS department was able to procure a part-time work study for one week of data entry assistance. The value of volunteered work cannot be overstated, especially in a field with such great data gathering and managing needs.

Thrilled to have the extra help, it was the challenge of the GIS Analyst to make the data input process as intuitive as possible for someone with no experience or knowledge of ESRI products or GIS in general. It was decided early on that raw data would be collected and domains would be employed later to decode the information. This would save hours by eliminating the need to reference code sheets during the data entry phase. Still, it unfortunately would not be possible to create a blank spreadsheet for data to be entered into and later joined to an address point layer because accidents are rarely linked to a specific address, but rather an intersection or block. For this reason one must plot each data point based on the accident location as described in the report. The challenge then became coming up with a creative way for the work study, an individual without intimate knowledge of Evans' streets, to easily find accident locations on a map in order to plot them. The answer was ultimately an easy one--use the search capabilities of ArcGIS Online's web-mapping interface to find and plot accidents. This worked very well because ArcGIS Online is incredibly user-friendly and it has a direct link to ArcMap which made bringing the data into a geodatabase and adding the necessary domains for decoding simple. All the work study had to do was type an intersection or block number and street into the search bar and they were taken to that location on the map without having to pan and zoom to find it. This made the process of finding accident locations and dropping corresponding points much faster, allowing us to meet our deadline with weeks to spare.

By using ArcGIS Online as a data-entry tool the work study, with no GIS experience, was able to enter two years' worth of data in half a week's time subsequently creating a powerful point map of accidents. In addition, the engineering department was supplied with the hard data they needed to

warrant new traffic safety infrastructure, City staff were given the ability to see accident hot-spots at a glance, and the City gained a powerful accident geodatabase which will help to better understand traffic patterns into the future. Traffic accident data entry is now on a set schedule ensuring the geodatabase is regularly maintained and thus valuable.

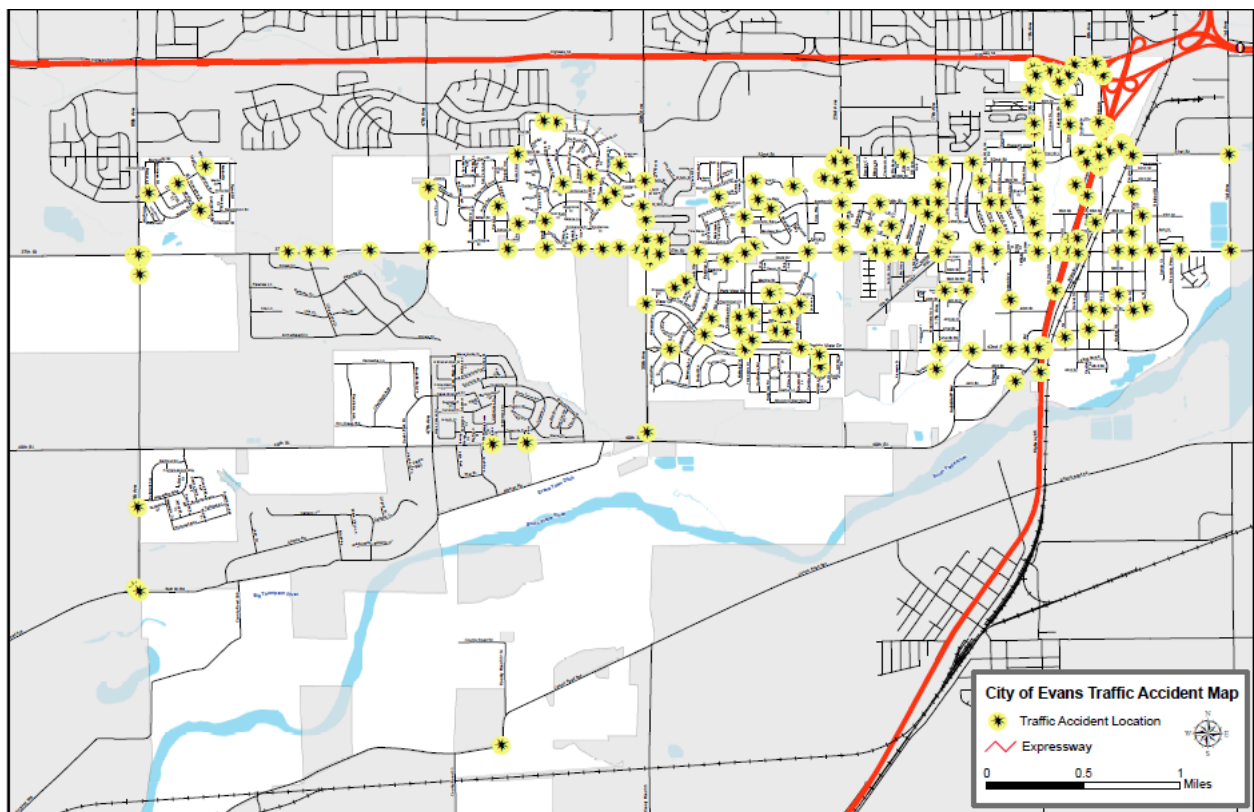
Figures:



*Traffic accident hot spot map in ArcGIS Online web map, October 2015*

Accidents_2015	
FID	245
CASE_NUM	1511866
DATE	August 24, 2015
NUM_INJURE	0
ADDRESS	
NUM_VEHICL	2
ROAD_COND	1
LIGHTING	1
WEATHER	0
ACTION	9
LOCATION	N
FACTOR	0.00
EVENT	8.00
ACCIDENT_B	N\Map...

*Attribute information in ArcGIS Online*



*Traffic accident point map, ArcMap 10.2.1, October 2015*

Identify

Identify from: <Top-most layer>

- Accidents\_2015
  - 1511866

Location: 3,212,922.860 1,381,386.597 Feet

Field	Value
OBJECTID	270
Shape	Point
CASE_NUM	1511866
DATE	8/25/2015
NUM_INJURED	0
ADDRESS	<null>
NUM_VEHICLES	2
ROAD_COND	DRY
LIGHTING	DAYLIGHT
WEATHER	CLEAR
ACTION	OTHER IMPROPER TURN
LOCATION	ROADWAY
FACTOR	NO APPARENT CONTRIBUTING FACTOR
EVENT	FRONT TO SIDE

Identified 1 feature

*Attribute information ArcMap 10.2.1*