



## Memorandum

TO: Mayor Marlin and City Council Members  
FROM: Melissa Haynes, Crime Analyst  
RE: IDOT and Crime Mapping Update  
DATE: May 18, 2017

---

I would like to provide an update to Council on the crime mapping software installation, which is a vital component to being able to analyze and provide valuable information regarding IDOT data. I am hopeful that despite the below described difficulties I will be able to provide the analysis of the first two quarters of 2017 of IDOT data in July including a mapping component, as I indicated at the Committee of the Whole meeting in March.

Please see the below table for a timeline of tasks completed in installing and configuring the newly purchased ArcGIS, Spatial Analyst Extension, and Bradshaw Consulting Services (BCS) Crime Analysis Tools. There have been some typical technical delays: for example, during configuration, there was an issue with permissions and authorizations for the program to be able to write to the computer. This was fixed and the second configuration was successful. The largest issue we are currently facing is with “dirty data” and the process of cleaning the non-standardized addresses.

Task	Completion date
Received contract from BCS	February 21, 2017
Contract reviewed by Legal Department	March 6, 2017
Contract reviewed by BCS	March 9, 2017
Contract signed	March 14, 2017
Competitive Purchase Form completed	March 20, 2017
Initial UPD data queries completed	March 30, 2017
Program installation	Week of April 3, 2017
Queries edited to meet software requirements	April 12, 2017
First address cleaning completed	April 21, 2017
First configuration, first attempt at geocoding	April 24, 2017
Second address cleaning completed	April 27, 2017
Second configuration, second geocoding attempt	May 1, 2017
Third address cleaning completed	May 10, 2017
Third geocoding attempt	May 12, 2017
Fourth address cleaning completed	May 16, 2017
Fourth geocoding attempt	May 17, 2017

A mapping analysis of data starts with geocoding, which is assigning a coordinate location to an address, so that it can be mapped. The basemap that we use for geocoding is maintained by the Champaign County Geographic Information Systems (GIS) Consortium, and follows addressing standards similar to those used by the Post Office, with components of the address broken into separate pieces of information. However, our problems are that the address fields in ARMS are not standardized; they are entered as one line of text, and therefore, there are several inconsistencies that are problematic. For example, 400 S Vine St could be entered as 400 Vine St S, 400 Vine, 400 Vine St, etc. This becomes an issue when the basemap is looking for "400 S Vine St". It's even more of an issue when addresses could be mapped to either street direction (N Vine or S Vine, E University or W University) but the ARMS data does not specify. Unfortunately, traffic stops are the most problematic, as the ticket indicates cross streets and not addresses. When cross streets have historically been entered into ARMS, they have not included street direction, leading to a large portion of traffic stops with lower than acceptable address matching scores.

I have worked extensively with the GIS Analyst from BCS, Urbana's Information Technology (IT) Department and the GIS Consortium to attempt to map the address fields using several tools. The GIS Consortium provided guidance on the structure of addresses as well as the programmatic side of the GIS Consortium geolocator functionality, which led the BCS GIS Analyst to build a geolocator specifically for UPD. The IT Department has written data transformations to restructure the freeform address field to attempt to standardize, at a minimum, the street direction, cross-street format, and apartment number.

For future data to be easier to map, I have talked to the PSR Coordinator about consistent address entry, and some changes will be made to the entry guidance (for example, entering directions on cross streets). However, the biggest improvement will be to change ARMS to standardize data entry fields. This change has been raised with the ARMS User Group (request #476), but was ranked 15th on the list of changes by the ARMS User Group in October 2016 – and so will not be accomplished any time in the next 6 months, at least. Even after this change is made, it would only impact future data entry, and would not cleanse any of the existing ARMS records.

I am continuing to work through the issues as they arise, and hope to present to the Committee of the Whole on July 24<sup>th</sup>. In the interim, please email me if you have any questions at [crimeanalysis@urbanaininois.us](mailto:crimeanalysis@urbanaininois.us).