Introduction Draft 3

Crime maps can be useful for both law enforcement agencies (LEAs) and citizens. The first crime maps depicting the rate of crimes relative to social factors in regions of 1830s France have been attributed to the subsequent creation of the fields of criminology and sociology[[1]](#footnote-1). In this digital age moved well beyond mapping with physical illustrations, crime mapping is used in varying levels of complexity and for various purposes for LEAS. One important use of crime mapping is public transparency. However, the adoption of digital crime mapping for public use has not been a consistent service of LEAS. In the United States (U.S.), the Federal Bureau of Investigation (FBI) has used the Uniform Crime Reporting (UCR) program to promote transparency and generate reliable crime statistics for the U.S. since 1930[[2]](#footnote-2). The current UCR standard for law enforcement agencies (LEAs) is to report individual incidents via the National Incident Based Reporting System (NIBRS). As more LEAs conform to NIBRS, there is an increasing body of standardized incident reports available to LEAs and the public. Incident based crime reports are raw in format, not aggregated like the former UCR program reports. This format provides flexibility for exploring crime data.

The resources available to U.S. LEAs for crime data analysis are wide ranging. There are approximately 18,000 U.S. law enforcement agencies across federal, state, county, and local jurisdictions [Banks, Hickman, 2016]. These agencies range in department size from 1-30,000 officers with the majority of agencies having 10 or fewer officers [Banks, Hickman, 2016]. Furthermore, the fragmented nature of U.S. law enforcement as a collection of independent agencies makes the adoption of data handling practices disparate. This paper provides an introductory framework for data visualization that can be affordably adopted by LEAs and engaged citizens interested in exploring geographical trends in police incidents.

(Main results)

(Main Conclusions)

First, this paper explores the history of open data and the importance of open data to promoting the use of data analytics in new domains such as public safety. For the novice LEA or citizen data analyst this paper explains the critical process of exploratory data analysis (EDA). Then, the value of geographic visualizations is discussed in the context of the birth of computing and modern crime analytics.

This paper moves on to describe the open source, NIBRS compliant, incident data of the Dallas Police Department used to build a framework for geovisualization. The methods section breaks down the major steps that should be taken to generate a reliable police incident map. Beyond the essential components of the framework, this paper lends examples of specific open source software and code that can be reused by novice crime analysts.

1. http://criminal-justice.iresearchnet.com/criminology/research-methods/crime-mapping/2/ [↑](#footnote-ref-1)
2. https://ucr.fbi.gov/ [↑](#footnote-ref-2)