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## Exploratory Analysis of Spatio-Temporal Crime Data in the City of Denver

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# Exploratory Analysis of Spatio-Temporal Crime Data in the City of Denver

By  
Daniel W. Pokorny  
April, 2017

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Daniel W. Pokorny

A project submitted in partial fulfillment of the requirements for the degree of  
Master of Science in  
Computer Information Systems

at  
Grand Valley State University  
April, 2017

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**Dr. Jonathan Leidig**

**Date**

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## **Abstract**

This project examines what types of spatio-temporal visualization techniques are applicable to crime data and explores how such visuals may be developed into a universally beneficial application for law enforcement and the community, with the primary goal of establishing collaboration between both parties. Five years of Denver crime data were collected and analyzed by the current generation of software tools. These tools were integrated to create visualizations utilized for the development of visual analytics based on geographical information. The resulting application provides the opportunity for individual analysis, monitoring, and collaboration between community members, analysts, and law enforcement agencies.

## **Introduction**

Cooperation between the community and law enforcement agencies has existed since the first agencies were put in place. Prior to the 1980's law enforcement agencies practiced a traditional form of policing which took a reactive approach to crime; a crime occurs and the police respond. In the 1980's the community-policing movement was introduced where crime prevention was the focus, and collaboration between agencies and the community acted as the driving resource towards this new goal (Somerville, 2009).

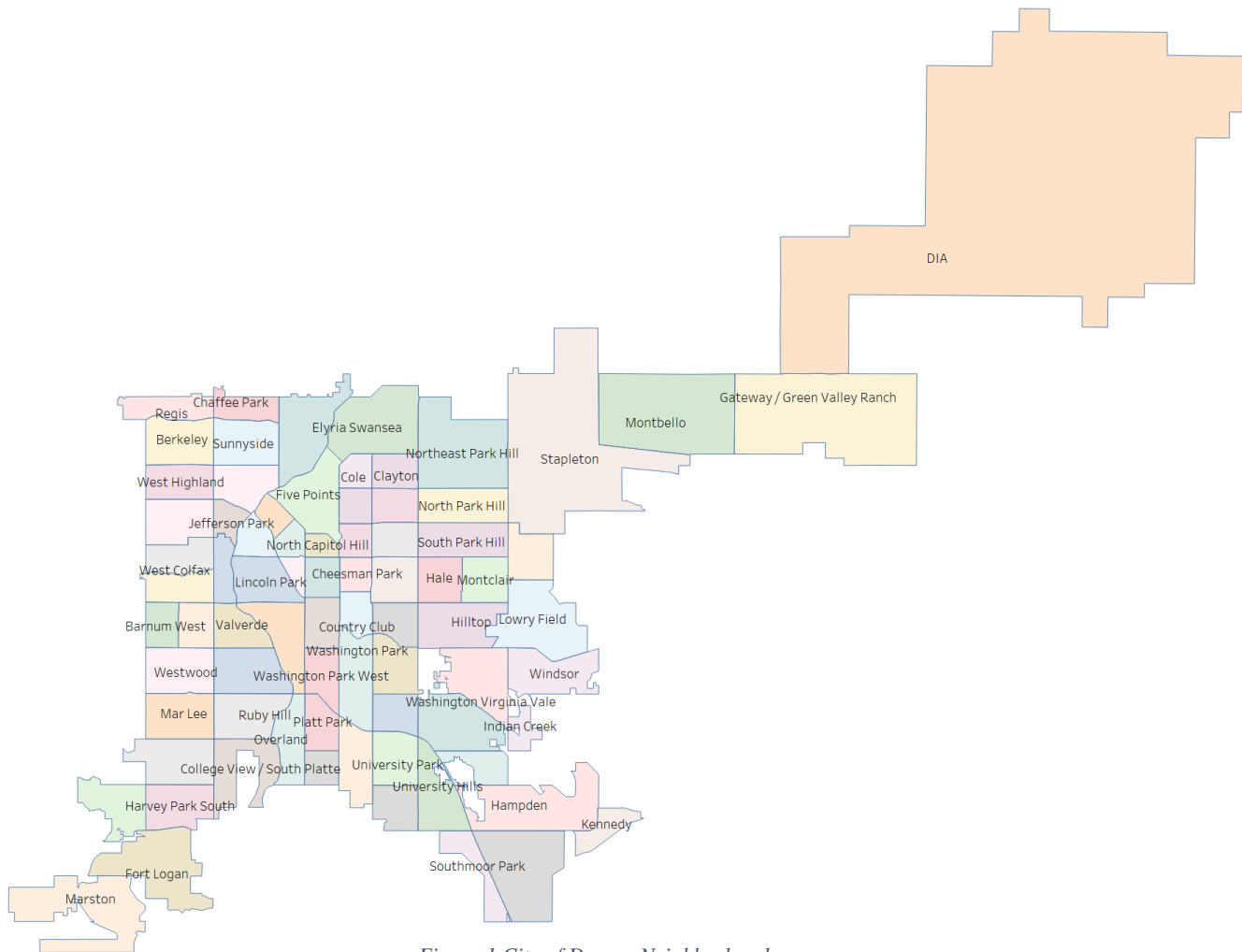
During this new era of policing, technology advanced and improved methods of crime data collection were implemented, resulting in the ability for local law enforcement agencies to develop their own geographical information systems (GIS). A GIS takes known geographic features and boundaries which are linked with spatial data (e.g. coordinates) to map points on map (Steinitz, 2014). A GIS allows law enforcement agencies to analyze large amounts of crime data and discover valuable insights into where and why crime occurs. This information can then be used by agencies to develop effective preventative policing strategies.

Many organizations have some type of a crime mapping system available on their public website. Anyone can access the application and interact with it for their own purposes. One may utilize the application to research crime statistics in neighborhoods for real estate purposes, or perhaps to simply see if there are any criminal activities occurring near their residence or place of work. While the current applications in place serve the individual needs of law enforcement agencies and the community, little effort has been made to see how these systems could be utilized as a platform where police and community collaboration is not only capable, but is encouraged. This project attempts to create that platform, a universally beneficial and collaborative open crime mapping application.

## **Background and Related Work**

### **Case Study**

Denver is the largest city in the state of Colorado with a population estimate of around 682,000 residents as of 2015 which was a 2.8 percent population growth from the year prior, making it the 19<sup>th</sup> largest city in the United States (US Census Bureau). Over the past 30 years Denver has been rapidly expanding in both a population and physical context. A main factor in this growth has been Denver's economic shift from a resource-based industry (mostly mining and agriculture) to a creative business venture centered economy; information and communication technology as the largest economic growth area (Murray, 2002).

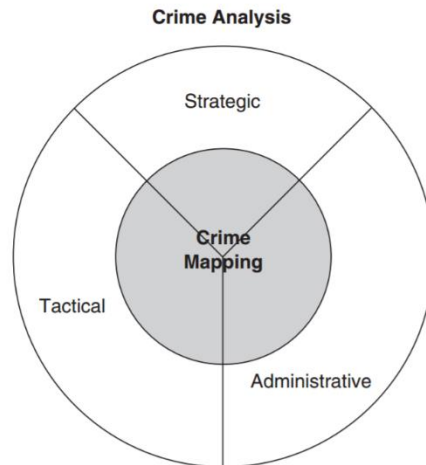


*Figure 1 City of Denver Neighborhoods.*

Denver is comprised of 78 neighborhoods, seven police districts, and 32 police precincts. The crime data utilized in this project was collected from the city of Denver’s open data portal, and consists of offenses recorded between 2012 and 2017. Additionally, weather data utilized in conjunction with crime data was collected from U.S. Climate Data.

### **Geographic Information Systems**

A geographical information system (GIS) is a software tool that utilizes spatial and temporal data to create geographic representations, allowing users to effectively modify, visualize, query, and analyze large amounts of data (Boba, 2006, p. 37). GIS software provides a framework for how data is collected, combined, and analyzed, providing users the ability to choose which aspects of the system to use.



*Figure 2 Relationship of Crime Mapping to Crime Analysis (Boba, 2006).*

A GIS is an excellent tool for law enforcement agencies to utilize for crime analysis. Crime analysis is comprised of three main forms: strategic, tactical, and administrative. When an individual analyzes a GIS, we can say that they are conducting crime mapping. Crime mapping is a police term defined by Boba (2006) as, "...the process of using a GIS to conduct spatial analysis of crime problems and other police-related issues." and it functions as a sub-discipline of crime analysis. The analysis of crime mapping is unique in the fact that it contains all three forms of crime analysis as shown in Figure 2.

One purpose of a GIS, crime mapping, and crime analysis is to help guide policymakers toward creating the most effective policing policies and procedures, whose ultimate goal is crime prevention. Crime mapping reveals patterns and trends in the data which contribute towards the development of crime prediction algorithms. Law enforcement agencies are then able to use this information for strategic planning purposes.

### **Crime Data**

There exist two main resources for crime statistics in the United States, the Uniform Crime Reports (UCR) and the National Incident-Based Reporting System (NIBRS). The UCR was developed in the 1920's by the FBI with the goal of creating a unified crime data collection system which could then be analyzed and in turn contribute accurate information towards the development of policing policies and procedures. Local law enforcement agencies would report their own incidents to the UCR monthly in a unified format that so all data could be easily compared or combined (National Institute of Justice (NIJ)).



Uniform Crime Reports	National Incident-Based Reporting System (NIBRS)
Tracks eight crimes	Tracks 46 crimes
Does report arrests in specific incidents	Contains information about arrests in each incident
Gives a tally of the incidents. Does not contain information on each reported incident	Contains information on each incident reported to police, including: <ul style="list-style-type: none"> <li>• Characteristics of victim(s) and offender(s)</li> <li>• Relationship between the victim and offender</li> <li>• Crimes committed</li> <li>• Injuries at the incident scene</li> <li>• Weapons used</li> <li>• Arrests made</li> <li>• Incident location</li> </ul>
Does not provide information about simple assault, which is the most commonly reported domestic violence offense	Provides information about cases involving simple assault
Reports only the most serious crime committed in a single incident (e.g., if a murderer has raped his victim, only murder is reported.)	Requires officers to report multiple offenses, victims and offenders. This allows researchers to compare and analyze multiple incidents.

*Figure 3 Comparison of UCR and NIBRS per the National Institute of Justice.*

The structure of the UCR remained unchanged up until the 1980's when law enforcement agencies recognized the need for restructuring. The UCR originally only recorded seven offenses; murder, robbery, rape, aggravated assault, burglary, theft and vehicle theft, and in 1979 arson was added making the total eight. While data on these offenses was useful, agencies sought to create a system that did not limit types of offenses recorded, and at the same time provided more detailed information about specific incidents. This envisioned system would allow individual agencies to analyze their own cities data for policy structuring purposes; compared to the UCR whose structure limited analysis to mostly large regions. The newly structured system was the NIBRS and was launched in 1989 (NIJ).

### **Related Work**

Most research projects utilizing spatio-temporal analysis was done so to answer either social questions, or conducted to better understand crime patterns for the purpose of improving law enforcement policies and procedures. A common trend I found in related works was that very specific parts of the crime data were used for very specific reasons. Iverin-Erkison and La Vigne (2015) used spatio-temporal data to examine crime-attracting characteristics of transit stations. Farrell, McDevitt, and Buerger (2002) examined traffic and pedestrian stops to try and discover racial profiling trends. Their goal was to have this research assist in developing a model of community-police task forces which would facilitate discussions and joint



Figure 4 Denver crime mapping application.

strategic crime-attracting characteristics of transit stations. Farrell, McDevitt, and Buerger (2002) examined traffic and pedestrian stops to try and discover racial profiling trends. Their goal was to have this research assist in developing a model of community-police task forces which would facilitate discussions and joint strategic planning for combatting racial profiling within their community. While collaboration is a common element between both projects, the primary focus for creating this collaboration is to address a single issue; racial profiling.

### Denver and Ottawa County Crime Maps

Figure 4 shows a screenshot of Denver's open crime map which can be accessed on the city's official website. The application is simple and straightforward. Users can search for crime incidents either by entering an address, or by utilizing the filters. The crime data used in the map is also available to download. An additional dropdown tab provides more details about the offenses mapped. The application is also dynamic, so if a user clicks on a recorded offense in the table below, the location where the offense occurred is simultaneously displayed on the map above. A major flaw in the application is the fact that the maximum number of offenses mapped is limited to 500. This

significantly reduces the scope of the system and minimizes the value to users. Density maps for example could be misleading since only a small fraction of the total incidents can be displayed.

The Ottawa County (OC) Public Incident Mapping application, as shown in Figure 5, had virtually the same data mapping capabilities as Denver’s application. Major differences were found in its interface design and functionality. During the first attempt to access the tool, I discovered issues with the applications web browser compatibility. The application would only execute in Internet Explorer and if you attempted to launch the application in any other web browser, you would be prompted with the message Like Denver, a maximum number of offenses mapped is limited to 500 thus presenting the same scope issues. What I did like about the application was its ability to scale. The number of mapped incident points changes as you zoom in and out which prevents overcrowding on the map, which would otherwise reduce its effectiveness.

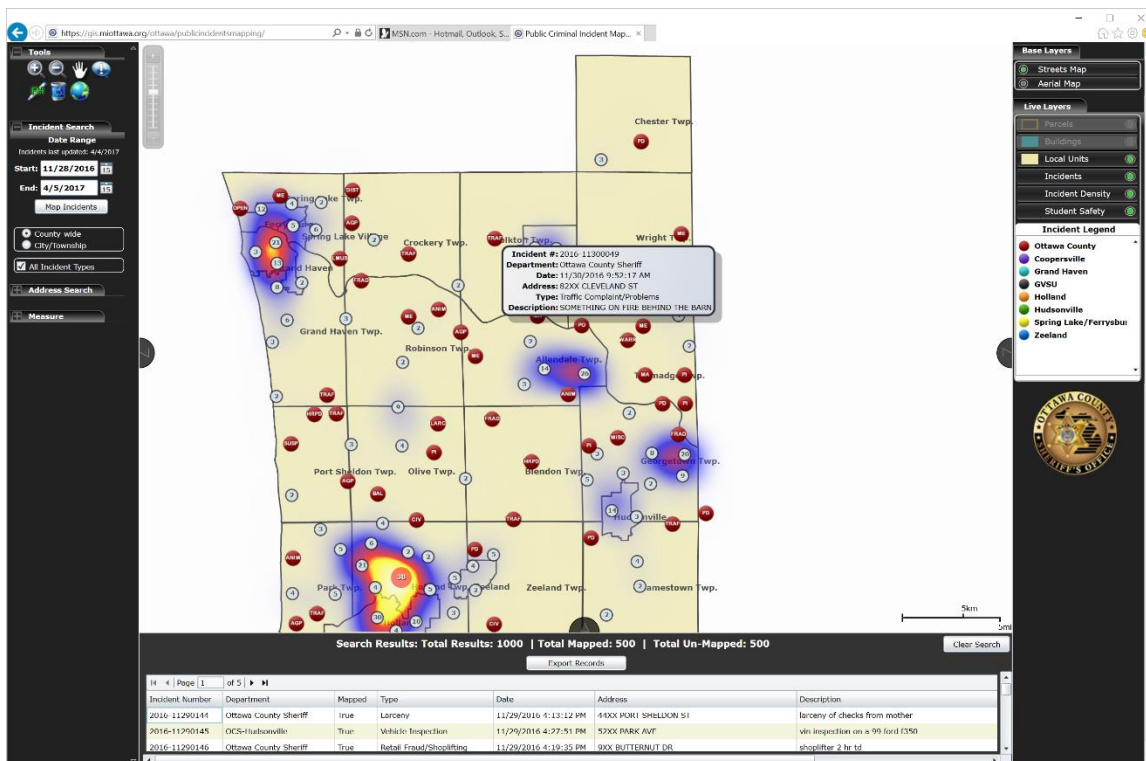


Figure 5 Ottawa County's Public Incident Map, crated in ArcGIS.

Two important differences I noticed between the two systems was their location and what I concluded was their purpose from a law enforcement perspective. Denver’s system was on the cities home website and was surrounded by links and phone numbers for various hotlines. The application seemed to be a part of their site, not just an added-on feature. Comparatively, Ottawa County’s GIS was a separate link, which had no instructions for how to download the complete dataset, and offered no information about how to contact the agency or how to use the application. Overall, both agencies attempted to deliver a similar system in terms of functionality, and both failed to produce a universally beneficial application. These applications cannot be used for accurate research and they

contain very little, if any, elements of police and community collaboration. Other than producing something aesthetically pleasing, these applications offer little value to building police-community relations.

### **Data Collection**

The crime data sets utilized in this project were collected from the city of Denver's open data catalog. The data was authored by the City and County of Denver and the Data Analysis Unit which is part of the Denver Police Department. The file formats available for download were in the format of a shapefile, comma-separated values (csv), gdb format (Esri File Geodatabase), and xml.

The organization of the data depended on which tool the data was going to be implemented in. Commercial focused tools such as Tableau, Esri, and Microsoft Power BI automatically organized the data similarly to the original file format. However, when utilizing the data in conjunction with open source libraries such as Chart.js, the data needed to be organized and queried in some type of management tool such as MongoDB.

Certain information has been omitted from the data by the Denver Police Department for legal reasons. It is also made perfectly clear in the sites posted disclaimer that this data is provided "as-is" and there are no guarantees to its completeness or accuracy. Other data withheld includes addresses of sexual assault victims, information on child abuse cases, offenses that involve juveniles, and offenses that contain information about witnesses which may be considered at risk. There also may exist records of "unfounded" crimes, which are crimes that have been reported and included in the dataset, but later discovered to have never happened. These unfounded reports are removed, but there is no way of knowing how many of these unfounded reports are in the current dataset.

### **Tools and Implementation**

After data was collected and organized in the appropriate manner, four tools were utilized to create visualizations:

1. Tableau – a business intelligence (BI) tool that allows a user to create interactive data visualizations which can then be published and managed through Tableau Online services or embedded into an HTML script for web publishing; I did the latter.
2. Microsoft Power BI – a suite of business analytic tools capable of creating dynamic visualizations which can then be embedded similarly as Tableau.
3. Chart.js open source libraries – an open source HTML 5 based JavaScript library that provides the foundation for developing animated and interactive graphs and visuals.
4. MongoDB – open-source cross-platform document-oriented database program.

I additionally attempted to utilize Esri, a spatial data analytics platform like Tableau, to create visuals but found the learning curve too extreme for the time allotted. I had previously utilized Tableau for a project so I was familiar with its platform and implementation capabilities, which is the main reason most visuals were created with this tool. I had

no prior experience with the other tools/methods. Power BI had the smallest learning curve which came at the expense of quality. Development in Power BI was much more rigid and limited compared to the features in the other tools, but its simplicity allowed for visuals to be quickly created and implemented. Development of visuals in Chart.js libraries was the most difficult and time consuming simply because my lack of previous experience in JavaScript. The most difficult task within this route was organizing the data. For this, I used MongoDB (which I have no prior experience with) to create a database where I could query data specific for my visual. Utilizing Ruby on Rails a web application was created where the visuals were organized and combined to create a dynamic crime mapping application.

# Result, Evaluation, and Reflection

## Visualizations

Figure 6 displays four star glyphs which show the total number of offenses (based on type) by districts. Star glyphs are simple visuals to interact with and can easily reveal a large amount of data in a small area. The visual is dynamic and allows a user to filter offense types displayed by clicking on the rectangular colored areas in the legend. By layering these offenses together on a single visual a user can easily identify which districts experience the most offenses compared to the others. Immediately a user can observe that District 6 experiences a high volume of offenses compared to District 7.

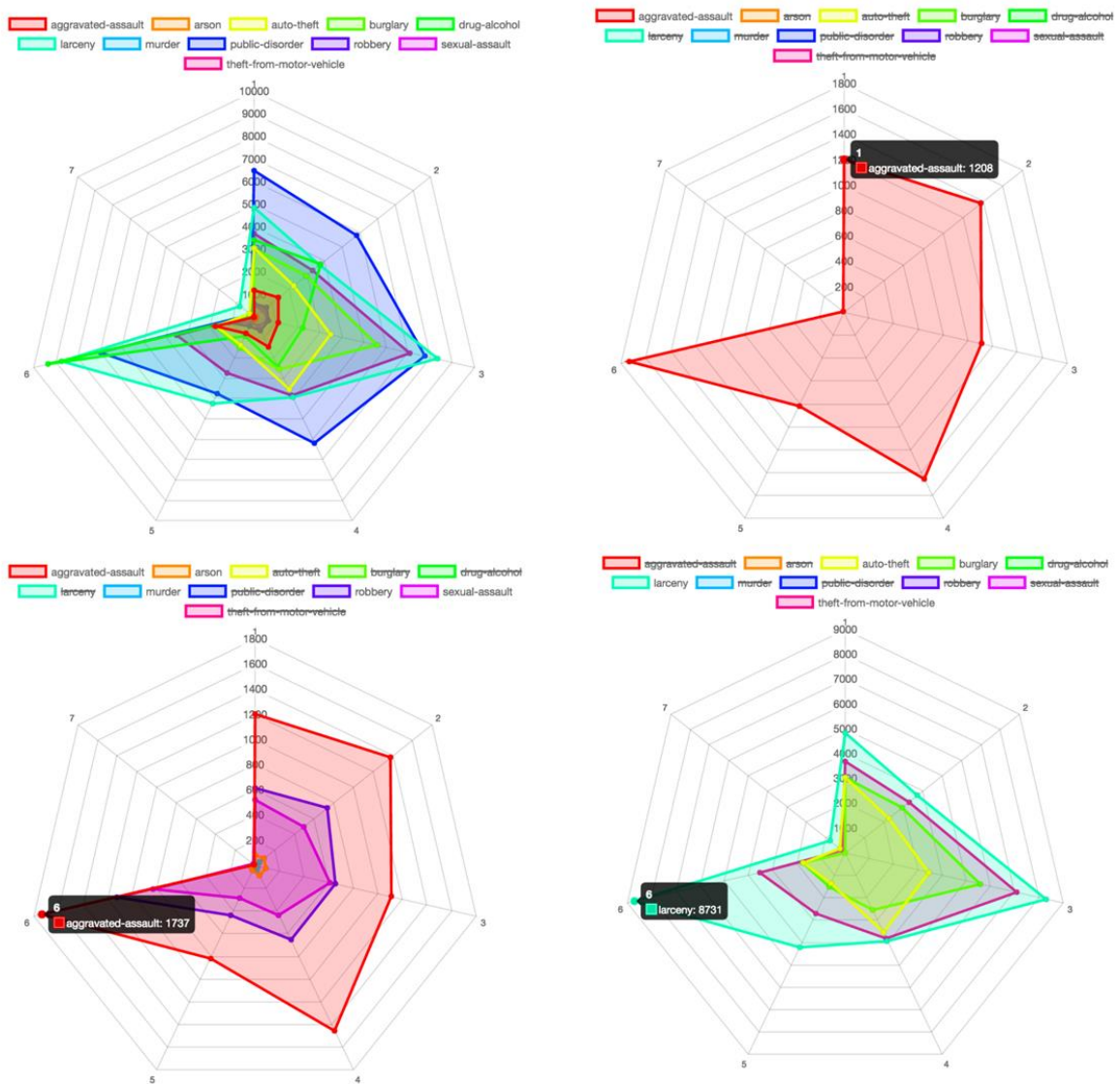


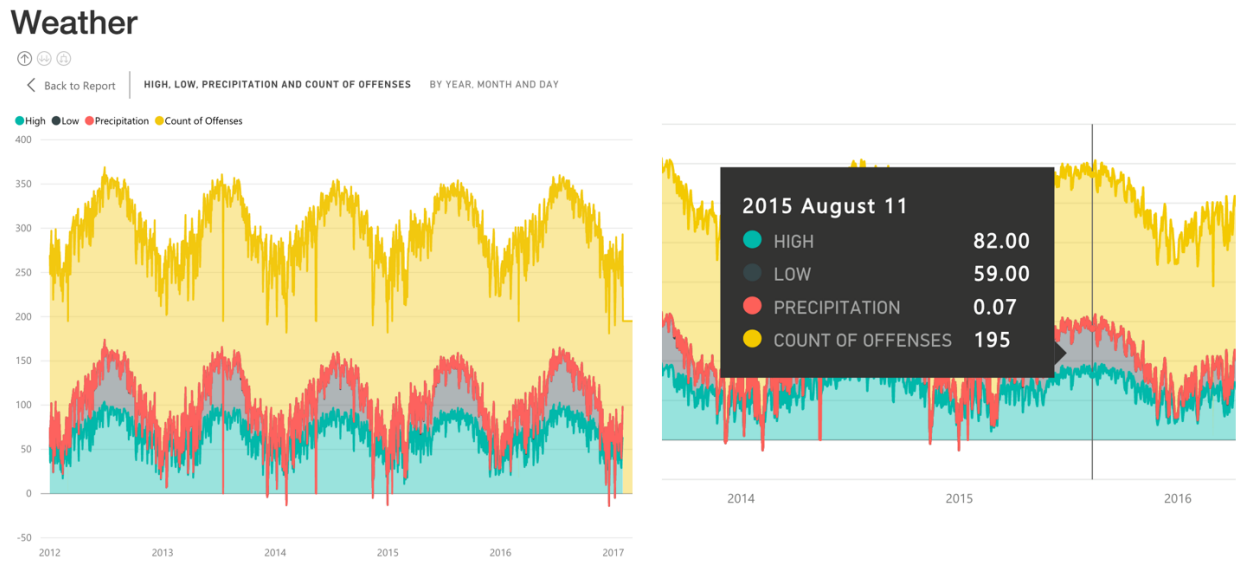
Figure 6 Star glyphs comparing the total of offense types by district. Multiple measures (offenses) are plotted over a categorical axis (districts).

Figure 7 shows three stacked calendar heatmaps with a diverging color scale. The heatmaps display the total number of offenses by month, day, and quarter. These heatmaps visualize periodic patterns and trends in the data. For example, we can tell by observing the change in color when looking at the maps from left to right, that each shows an increase in the number of records; green  $\rightarrow$  red. A user can also easily identify any anomalies in the data (Unwin, Hoffmann, Theus, 2006).



Figure 7 Calendar heatmap with a diverging color scale displaying how total offenses for a month, day, or quarter of the year vary.

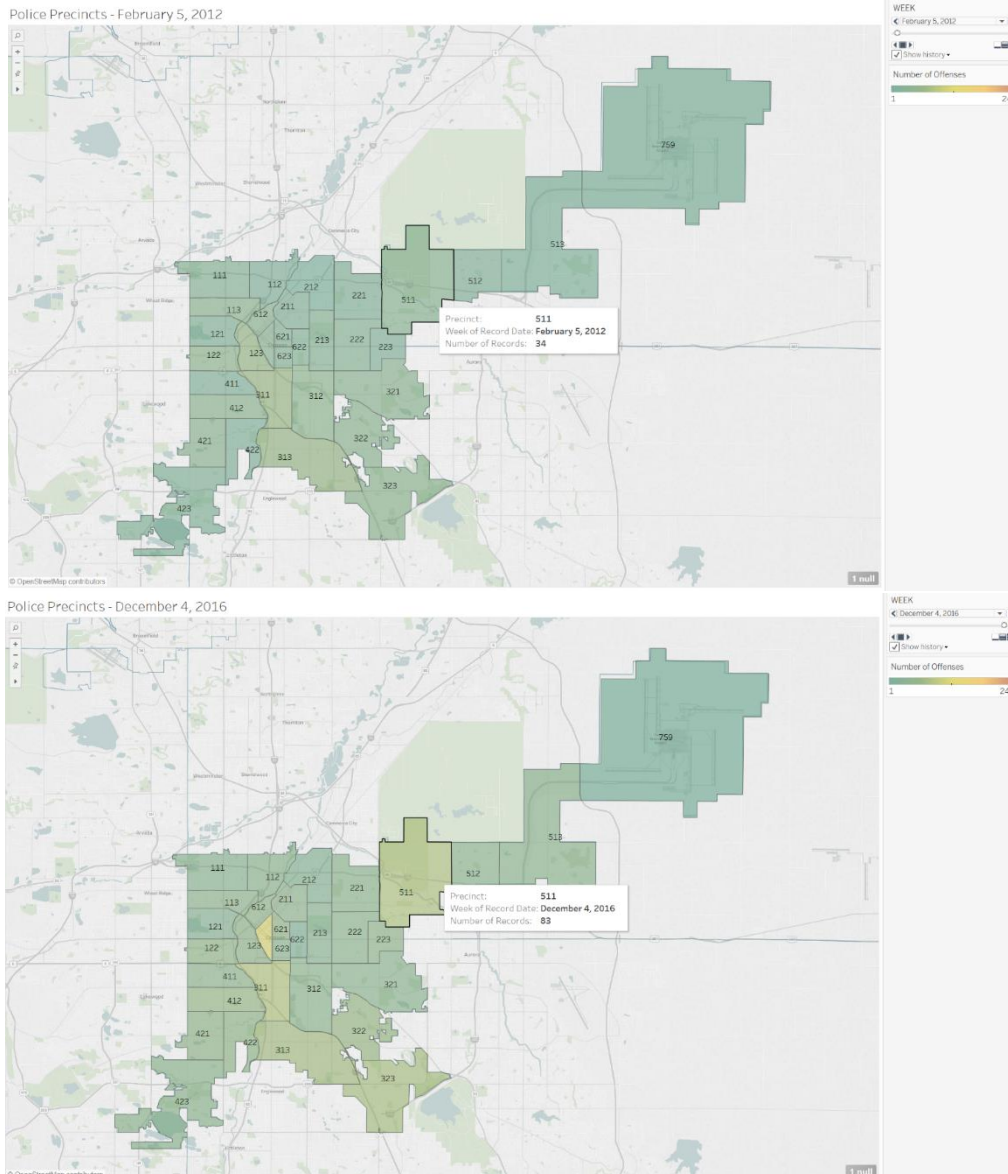
Figure 8 is a graph stream visual comparing historical weather data with offenses. The visual is dynamic so as a user scrolls over the various dates along the X-axis, data from all four variables are displayed (pictured to the right in Figure 3). A more advantageous use a stream graph shows is the correlation between the weather variables, and offenses. A user can clearly observe that as temperatures rise, so do the number of offenses. Such trends would be beneficial to law enforcement agencies in terms of personnel logistics.



*Figure 8 Graph stream visualization comparing weather variables with offenses. This is a useful visualization for detecting irregularities as well as patterns. The graph indicates that weather has a correlation with crime.*

Figure 9 features two screenshots of an animated heatmap showing the number of recorded offenses per day, and is broken down by police precincts. Animated visuals are useful for observing changes over a specific period of time. Filters allow the user to run the animation either over the entire span of time in which the data is represented, or by a specified date selected in a drop-down menu. A user is also able to select what speed the animation plays at. This is important because it would be difficult for a user to observe change if the animation was playing slowly. By increasing the speed of the animation, a user can more easily observe changing trends in the color scheme. The user is also able to navigate over the precincts to observe quantitatively the number of offenses that occurred within that district on a certain date. An animated heatmap does an excellent job of showing where crime is growing in comparison to other precincts. The top screenshot in Figure 4 visualizes data from 2012 and the bottom shows data from 2016. In comparing these two images we can see that certain districts experienced more crime growth than others. This information can help law enforcement agencies determine which districts need more funding or attention overall. This animation could also be useful for commercial/residential developers and individual citizens as it reveals the direction each area is going towards in terms of crime rates.

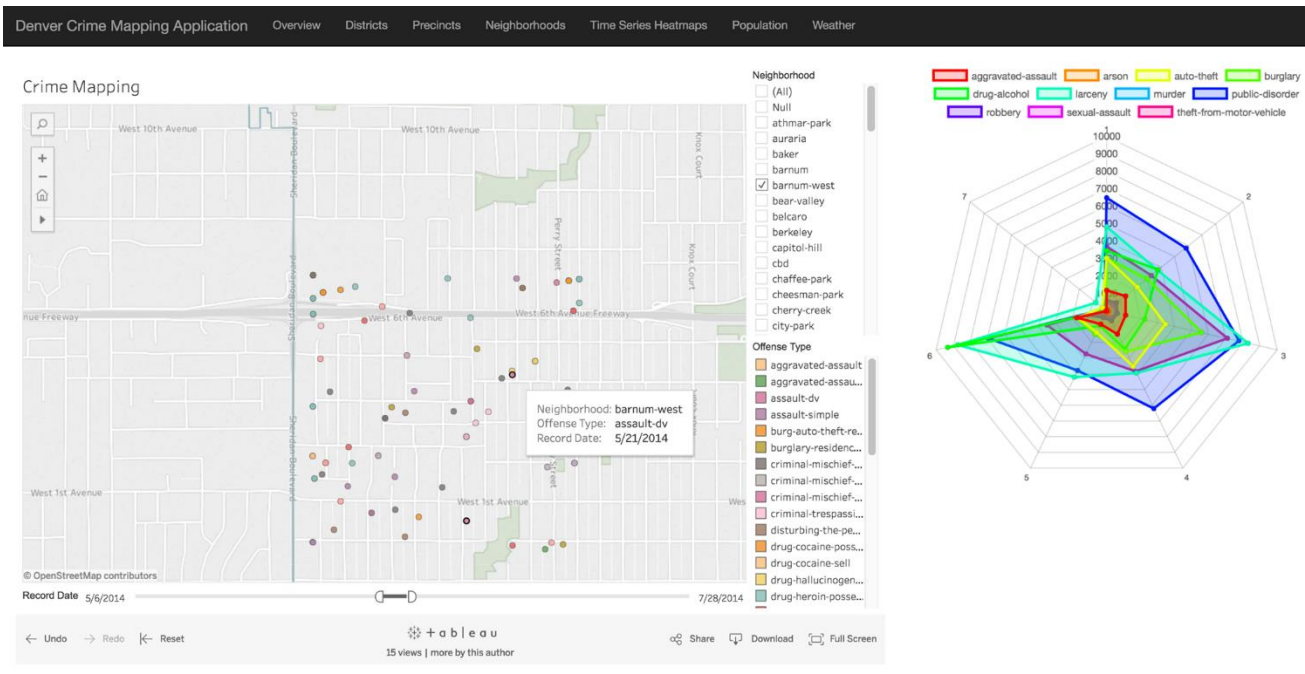




*Figure 9 Animated heatmap showing number of recorded incidents per day within individual police precincts over a five-year period.*

### **Crime Mapping Application**

The individual visualizations are then combined to create the final web application. Figures 10 through 13 show screenshots of the various pages within the application. The top navigation bar of the application remains fixed in position no matter what page the user is on. This provides the user with a stable environment and increases navigational efficiency throughout the application. Figure 10 shows the Overview page which contains a simple point feature map which allows a user to search for incidents between a certain time period, by neighborhood, and by offense type. The star glyph is positioned to the right of the map, allowing a user to analyze the same data from different perspectives.



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Figure 10 The 'Overview' page of the crime mapping application which contains a point feature map and a star glyph.

Each page focuses on specific geographical breakdowns of the city. The purpose of this multi-page setup in the application is to provide the most information for as many user types as possible. This aspect of the application is one advantage it has over current cities interactive web applications which lack depth and flexibility, thus failing to meet the needs of users.

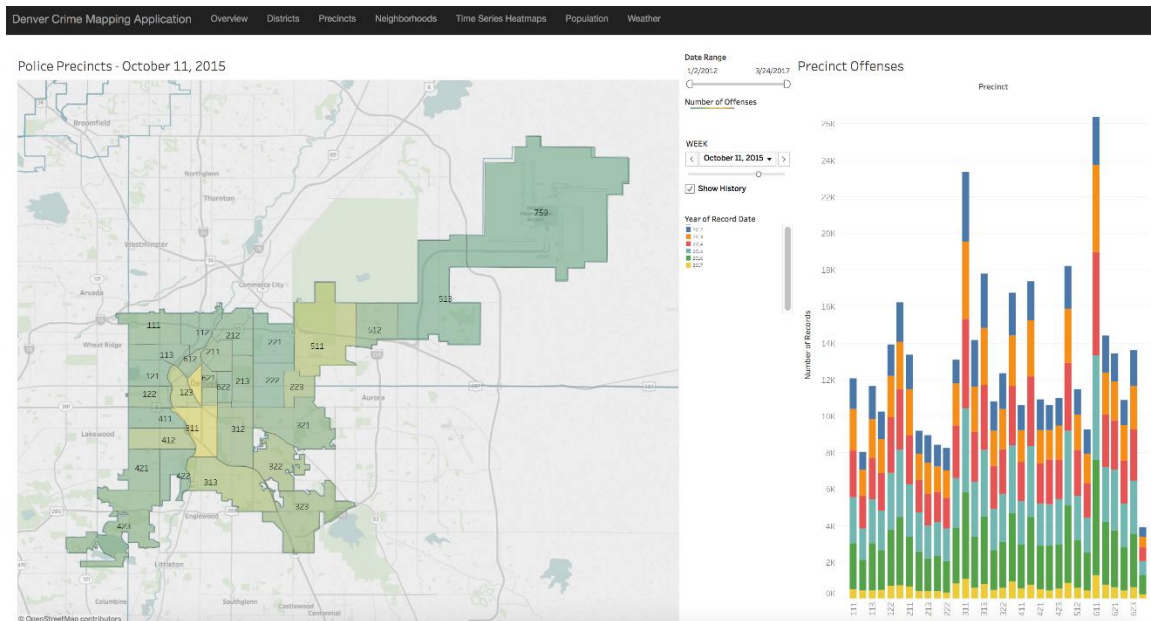


Figure 11 Precincts page displaying an animated heatmap on the left, supported by a graph showing the total number of offenses by type and year

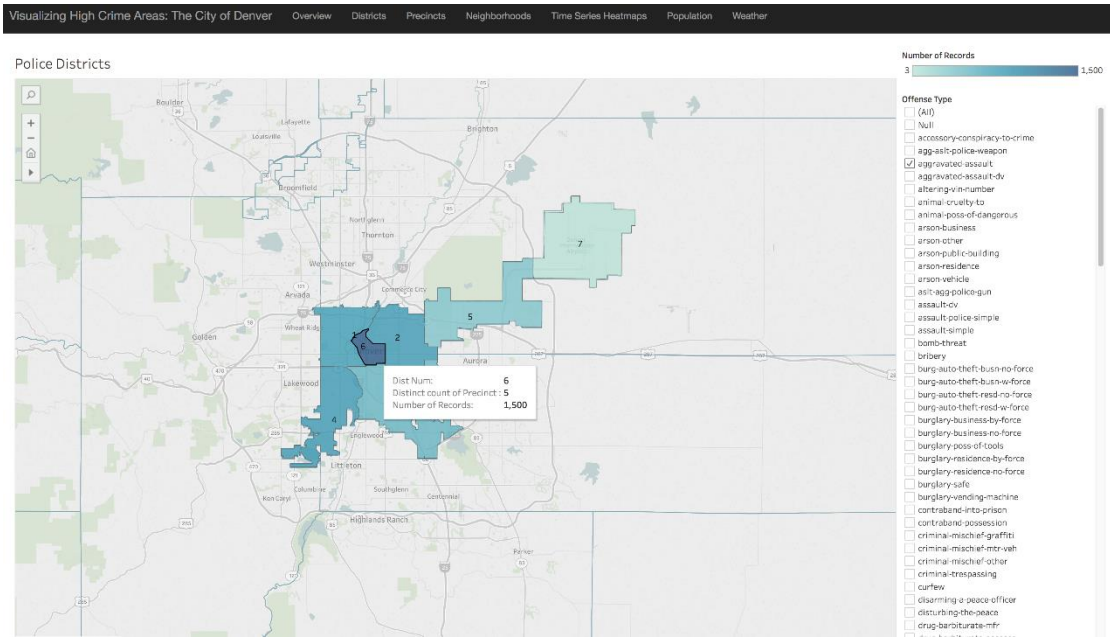


Figure 12 Graduate color map of offenses based by police districts.

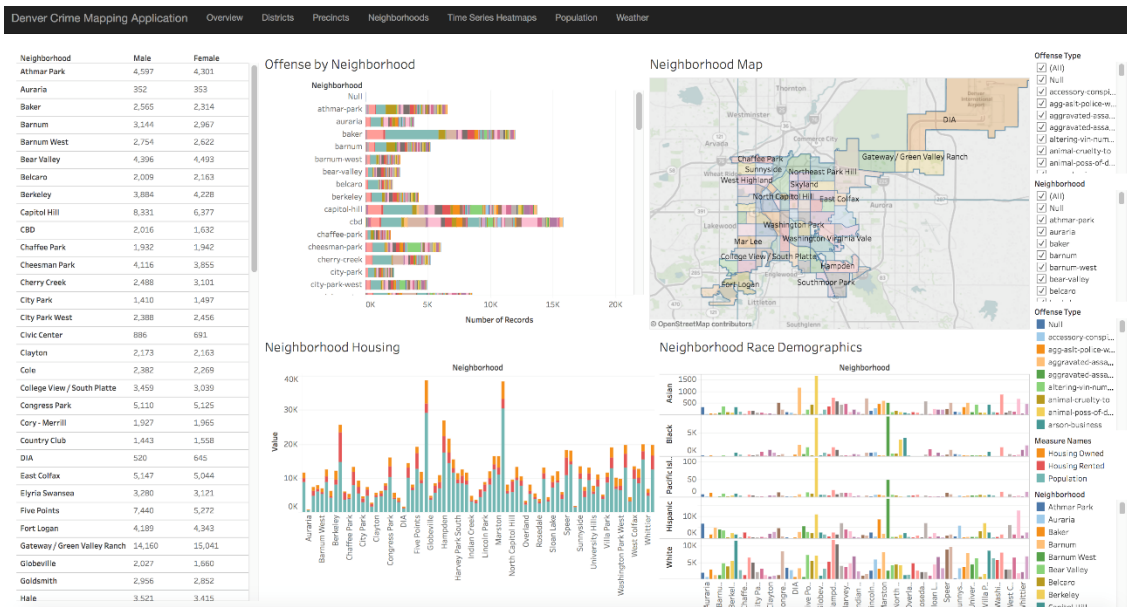


Figure 13 Neighborhood page of the crime mapping application which has various interactive and dynamic visuals and supporting charts.

## **Evaluation and Reflection**

From a law enforcement user perspective, the application is capable of addressing all three regions of crime analysis thus providing valuable insight which in turn can be utilized to develop more effective policing policies and procedures. The application adequately provides individual community members the ability to interact in the same manner as law enforcement for the purpose of answering individually motivated questions. While both these parties are able to utilize the application for their own benefit, the application lacks the ability of creating a collaborative environment and further development would be necessary to bridge the gap between the law enforcement agencies and the community.

## **Conclusions and Future Work**

### **Open Issues**

While the UCR creates uniformity in crime data collection methods, it does not guarantee compatibility with all tools, nor is there any standards for how this data is made available to the public. Each visualization tool has its advantages and disadvantages, thus, a developer may wish to use both to exploit certain features of the tool, but that may not be possible because the format of the data file may not be compatible with the tool. For example, Esri accepts shapefiles while only certain platforms in Tableau can read shapefiles. This may or may not be an issue depending on what other data resources are available, but it is certainly less efficient constantly having to work with different files, sometimes from different sources, to complete a task.

Attribute format may also inhibit how data can be combined within a tool for analysis. In Tableau, I came across issues when trying to create a join between two data sources which shared a similar attribute; neighborhoods. The first character of the neighborhood name in one file was capitalized, while the other was not, which resulted in Tableau not being able to join the two data sources. The only option would be to use a differently formatted file of the same data, such as xml or .csv, and use another tool to change the format of the attribute within that file so that a join is possible.

These issues arise because there is little organization and collaboration between agencies on GIS development. There exists an assumption that because crime reports are provided to the UCR and NIBRS in a standardized format, that this carries over to GIS development aspect as well, which is not the case. GIS development standards should be established and promoted in the same manner crime reporting was with the UCR. This however will not happen until GIS's are recognized as positive environments that contribute to the growth of police and community collaboration.

### **Future Work**

Future GIS projects should focus on creating features that promote collaboration between law enforcement and the community. A GIS is a powerful tool and its benefits should be positively exploited as much as possible. If agencies are going to spend the time and resources developing an online crime mapping application, they should spend the

time and funds to examine all possible uses it may have. Future GIS development by any city, agency, or organization should try and develop their system to align with their organizations goals. For example, the mission statement of the Denver Police Department is as follows:

“In partnership with the community, we endeavor to operate a police agency with a focus on preventing crime in a respectful manner, demonstrating that everyone matters.”

Had the Denver GIS been developed with the key goal of aligning its purpose to the organizations, a more collaborative system would have resulted.

### **Envisioned Scenario**

Local church group members want to collaborate on a project focused on reducing drug use in their community. They could utilize the GIS to locate areas of high drug offenses, and focus their efforts on those areas. Events such as support group meetings or other gatherings could be incorporated into the GIS. A specific area of the site would dedicate space for this particular project allowing for open communication between project volunteers, law enforcement, and non-church members who have joined the project at a later time.

Future projects can implement features that would allow for such a scenario to become a reality. However, before agencies invest in such systems, their value must first be proven. This can only be achieved through further research efforts which will ultimately be the driving factor for the development of GIS standards and the implementation of systems that serve a variety of users and purposes.

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## Appendices

### **Appendix A - Official Definitions for National Incident-Based Reporting System (NIBRS) crime types**

*Murder* - Murder is the willful killing of one human being by another. As a general rule, any death due to injuries received in a fight, argument, quarrel, assault, or commission of a crime is counted as a Murder. The definition of Murder excludes the following situations: deaths caused by negligence, suicide, or accident; justifiable homicides; and attempts to murder or assaults to murder, which are counted as Aggravated Assaults. It is important to note that Murders are counted based on the specific circumstances of the incidents, not on the criminal charges filed as a result of those incidents. For instance, situations where a victim dies of a heart attack as the result of a robbery or witnessing a crime do not meet the criteria for inclusion in the Murder classification.

*Aggravated Assault* - Aggravated Assault is the unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury. Aggravated Assault is usually accompanied by the use of a weapon or by other means likely to produce death or great bodily harm. An attempted Aggravated Assault that involves the display of—or threat to use—a gun, knife, or other weapon is included in this crime category, because serious personal injury would likely result if the assault were completed.

*Forcible Sex Offenses* - Forcible sex offense is any sexual act directed against another person, forcibly and/or against that person's will; or not forcibly or against the person's will where the victim is incapable of giving consent because of his/her temporary or permanent mental or physical incapacity.

*Non-Forcible Sex Offenses* - Non-forcible sex offense is the unlawful, non-forcible sexual intercourse. This includes incest, where persons are related to each other and statutory rape where the victim is under the statutory age of consent.

*Kidnapping/Abduction* - Kidnapping or abduction is the unlawful seizure, transportation and/or detention of a person against his/her will or a minor without the consent of a legal guardian or parent.

*Simple Assault* - Simple assault is the unlawful physical attack by one person upon another where no weapons are involved and the victim does not have severe bodily injury.

*Intimidation* - Intimidation is to unlawfully place another person in reasonable fear of bodily harm through words or conduct but without displaying a weapon or attacking the victim.

*Arson* - Arson is the willful or malicious burning or attempting to burn, with or without intent to defraud, a house, public building, motor vehicle or aircraft, personal property of another, etc.

*Bribery* - Bribery is the offering, giving, receiving or soliciting of anything of value to sway the judgment or action of a person in a position of trust or influence.

*Counterfeiting/Forgery* - Counterfeiting and forgery involve the altering, copying, or imitating of something, without authority or right, with the intent to deceive or defraud by passing the copy or thing altered or imitated as if it were original or genuine; or the selling, buying, or possession of an altered, copied, or imitated thing with the intent to deceive or defraud. Attempts are included.

*Criminal Mischief/Damaged Property* - Vandalism involves acts that willfully or maliciously destroy, injure, disfigure, or deface any public or private property, real or personal, without the consent of the owner or person having custody or control by cutting, tearing, breaking, marking, painting, drawing, covering with filth, or any other such means as may be specified by local law. Attempts are included. Graffiti is a form of Vandalism.

*Embezzlement* - Embezzlement is the unlawful misappropriation or misapplication by an offender to his/her own use or purpose of money, property, or some other thing of value entrusted to his/her care, custody, or control.

*Extortion* - Extortion is to unlawfully obtain money, property or any other thing of value either tangible or intangible through the use or threat of force, misuse of authority, threat of criminal prosecution, threat of destruction of reputation or social standing or through other coercive means.

*Fraud* - Fraud is the intentional perversion of the truth for the purpose of inducing another person or other entity in reliance upon it to part with something of value or to surrender a legal right. This offense includes the fraudulent conversion and obtaining of money or property by false pretenses. Confidence games and bad checks, except forgeries and counterfeiting, are included.

*Larceny* - Larceny is the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another; attempts to do these acts are included in the definition. This crime category includes shoplifting, pocket-picking, purse-snatching, bicycle thefts, and so forth, in which no use of force, violence, or fraud occurs. Excluded from Larceny are Auto Theft and Theft from Motor Vehicle Theft from Motor Vehicle, which are classified in separate offense categories; and crimes that involve Embezzlement, confidence games, Forgery, and worthless checks.

*Theft from Motor Vehicle* - The theft of articles from a motor vehicle, whether locked or unlocked or the theft of any part or accessory affixed to the interior or exterior of a motor vehicle in a manner that would make the item an attachment of the vehicle or necessary for its operation.

*Motor Vehicle Theft* - Motor vehicle theft is the theft or attempted theft of a motor vehicle. The offense includes the stealing of automobiles, trucks, buses, motorcycles, snowmobiles, etc. The taking of a motor vehicle for temporary use by persons having lawful access is excluded from this definition.



*Robbery* - Robbery is the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear.

*Stolen Property* - Stolen Property Offenses include the buying, receiving, possessing, selling, concealing, or transporting of any property with the knowledge that it has been unlawfully taken, as by Burglary, Embezzlement, Fraud, Larceny, Robbery, etc. Attempts are included.

*Drugs/Narcotics Violations* - Drug Abuse Violations include the production (cultivation and/or manufacture), transportation or importation, distribution or sale, purchase, possession, or use of any controlled drug or narcotic substance. The following drug categories are specified: opium or cocaine and their derivatives (morphine, heroin, codeine); marijuana; synthetic narcotics – manufactured narcotics that can cause true addiction (Demerol, methadone); and dangerous non-narcotic drugs (barbiturates, Benzedrine).

*Gambling* - Gambling is to unlawfully bet or wager money or something else of value, assist, promote or operate a game of chance for money or some other stake.

*Child Pornography* - Child pornography is the violation of law prohibiting the manufacture, publishing, sale, purchase or possession of sexually explicit material of children.

*Prostitution* - Prostitution is the unlawful promotion of or participation in sexual activities for profit, including attempts.

*Weapon Law Violations* - Weapons offenses include the violation of laws or ordinances prohibiting the manufacture, sale, purchase, transportation, possession, concealment, or use of firearms, cutting instruments, explosives, incendiary devices, or other deadly weapons. Attempts are included.

*Fraud – NSF – Closed Account* - Fraud –NSF-closed account is to report a check written or other payments made on a closed or “non-sufficient funds” account.

*Curfew* - Curfew offenses involve violations by juveniles of local curfew ordinances.

*Disorderly Conduct/Disturbing the Peace* - Disorderly conduct is any behavior that tends to disturb the public peace or decorum, scandalize the community, or shock the public sense of morality.

*Family Offenses/Nonviolent* - Family offenses are unlawful, nonviolent acts by a family member (or legal guardian) that threaten the physical, mental, or economic well-being or morals of another family member and that are not classifiable as other offenses, such as Sex Assault, Other Assault or Sex Offenses. Attempts are included.

*Liquor Law/Drunkenness* - Liquor law violations are the violation of laws prohibiting the manufacture, sale, purchase, transportation, possession or use of alcohol

beverages. Drunkenness is to drink alcoholic beverages to the extent that one’s mental faculties and physical coordination are substantially impaired. Excludes Driving Under the Influence.

*Other Sex Offenses* - Other sex offenses includes fondling, indecent exposure, window peeping, failing to register as a sex offender and child enticement.

*All Other Offenses* - All Other Offenses include any violations of state or local laws not otherwise specifically except traffic violations.

**Appendix B – Reference for offense codes, offense types, and offense categories used in the datasets**

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
2804	stolen-property-possession	Possession of stolen property	all-other-crimes	All Other Crimes
2804	fraud-possess-financial-device	Possession of a financial device	all-other-crimes	All Other Crimes
2901	damaged-prop-bus	Damaged business property	public-disorder	Public Disorder
2902	criminal-mischief-private	Criminal mischief to private property	public-disorder	Public Disorder
2903	criminal-mischief-public	Criminal mischief to public property	public-disorder	Public Disorder
2999	criminal-mischief-other	Criminal mischief - other	public-disorder	Public Disorder
2999	criminal-mischief-mtr-veh	Criminal mischief to a motor vehicle	public-disorder	Public Disorder
2999	criminal-mischief-graffiti	Criminal mischief - graffiti	public-disorder	Public Disorder
3501	drug-hallucinogen-mfr	Manufacture of a hallucinogenic drug	drug-alcohol	Drug & Alcohol
3503	drug-hallucinogen-sell	Selling a hallucinogenic drug	drug-alcohol	Drug & Alcohol
3504	drug-hallucinogen-possess	Possession of a hallucinogenic drug	drug-alcohol	Drug & Alcohol
3510	drug-heroin-sell	Selling heroin	drug-alcohol	Drug & Alcohol
3512	drug-heroin-possess	Possession of heroin	drug-alcohol	Drug & Alcohol
3520	drug-opium-or-deriv-sell	Selling opium or an opium derivative	drug-alcohol	Drug & Alcohol
3522	drug-opium-or-deriv-possess	Possession of opium or an opium derivative	drug-alcohol	Drug & Alcohol
3530	drug-cocaine-sell	Selling cocaine	drug-alcohol	Drug & Alcohol
3532	drug-cocaine-possess	Possession of cocaine	drug-alcohol	Drug & Alcohol
3540	drug-synth-narcotic-sell	Selling a synthetic narcotic drug	drug-alcohol	Drug & Alcohol

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
3542	drug-synth-narcotic-possess	Possession of a synthetic narcotic drug	drug-alcohol	Drug & Alcohol
3550	drug-poss-paraphernalia	Possession of drug paraphernalia	drug-alcohol	Drug & Alcohol
3560	drug-marijuana-sell	Selling marijuana	drug-alcohol	Drug & Alcohol
3562	drug-marijuana-possess	Possession of marijuana	drug-alcohol	Drug & Alcohol
3563	drug-marijuana-cultivation	Cultivation of marijuana	drug-alcohol	Drug & Alcohol
3570	drug-methamphetamine-mfr	Manufacture of methamphetamine	drug-alcohol	Drug & Alcohol
3571	drug-methamphetamine-sell	Selling methamphetamine	drug-alcohol	Drug & Alcohol
3572	drug-methamphetamine-possess	Possession of methamphetamine	drug-alcohol	Drug & Alcohol
3580	drug-barbiturate-mfr	Manufacture of a barbiturate	drug-alcohol	Drug & Alcohol
3581	drug-barbiturate-sell	Selling a barbiturate	drug-alcohol	Drug & Alcohol
3582	drug-barbiturate-possess	Possession of a barbiturate	drug-alcohol	Drug & Alcohol
3599	drug-pcs-other-drug	Other dangerous drugs - PCS	drug-alcohol	Drug & Alcohol
3599	drug-make-sell-other-drug	Manufacture or sell other dangerous drugs	drug-alcohol	Drug & Alcohol
3601	sex-aslt-fondle-adult-victim	Fondling of an adult	sexual-assault	Sexual Assault
3605	indecent-exposure	Indecent exposure	other-crimes-against-persons	Other Crimes Against Persons
3607	sex-off-incest-with-adult	Incest with an adult	other-crimes-against-persons	Other Crimes Against Persons
3611	window-peeping	Window Peeping	other-crimes-against-persons	Other Crimes Against Persons
3612	sex-off-fail-to-register	Failure to register as a sex offender	all-other-crimes	All Other Crimes
3613	sex-off-registration-viol	Sex offender registration violation	all-other-crimes	All Other Crimes
3615	indecent-exposure-to-adult	Indecent exposure to an adult	other-crimes-against-persons	Other Crimes Against Persons
3699	sex-off-other	Sex offense - other	other-crimes-against-persons	Other Crimes Against Persons
3700	obscene-material-possess	Possession of obscene material	other-crimes-against-persons	Other Crimes Against Persons

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
3701	obscene-material-mfr	Manufacture of obscene material	other-crimes-against-persons	Other Crimes Against Persons
3799	other-obscenity-crime	Other obscenity crime	other-crimes-against-persons	Other Crimes Against Persons
3804	bigamy	Bigamy	all-other-crimes	All Other Crimes
3902	gambling-card-game-operating	Operating a gambling card game	all-other-crimes	All Other Crimes
3905	gambling-dice-game-operating	Operating a gambling dice game	all-other-crimes	All Other Crimes
3908	gambling-possess-gamb-device	Possession of a gambling device	all-other-crimes	All Other Crimes
3911	gambling-device	Running a gambling operation	all-other-crimes	All Other Crimes
3915	gambling-lottery-operating	Running an illegal lottery	all-other-crimes	All Other Crimes
3919	gambling-sports-tampering	Tampering with sports	all-other-crimes	All Other Crimes
3990	gambling-betting-wagering	Gambling - betting or wagering	white-collar-crime	White Collar Crime
3991	gambling-gaming-operation	Gambling - gaming operation	all-other-crimes	All Other Crimes
3999	gambling-illegal	Illegal gambling	all-other-crimes	All Other Crimes
4001	prostitution-keep-a-house-of	Keeping a house of prostitution	public-disorder	Public Disorder
4002	prostitution-procure-for	Procure for prostitution (trafficking, operating a bordelo)	public-disorder	Public Disorder
4002	prostitution-pimping	Pimping for prostitution	public-disorder	Public Disorder
4004	prostitution-engaging-in	Engaging in prostitution	public-disorder	Public Disorder
4004	prostitution	Prostitution	public-disorder	Public Disorder
4099	prostitution-aiding	Aiding the act of prostitution	public-disorder	Public Disorder
4099	prostitution-display-for	Display for prostitution	public-disorder	Public Disorder
4101	liquor-manufacturing	Manufacture of liquor	drug-alcohol	Drug & Alcohol
4102	liquor-sell	Illegal sale of liquor	drug-alcohol	Drug & Alcohol
4104	liquor-possession	Illegal possession of liquor	drug-alcohol	Drug & Alcohol
4105	liquor-misrepresent-age-minor	Liquor law violation	drug-alcohol	Drug & Alcohol
4199	liquor-other-viol	Liquor law violation - other	drug-alcohol	Drug & Alcohol
4200	public-intoxication	Public intoxication	drug-alcohol	Drug & Alcohol

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
4801	police-resisting-arrest	Resisting arrest	all-other-crimes	All Other Crimes
4802	police-obstruct-investigation	Obstruction of a criminal investigation	all-other-crimes	All Other Crimes
4803	police-false-information	Giving false information to police	all-other-crimes	All Other Crimes
4803	police-making-a-false-rpt	Making a false report to police	all-other-crimes	All Other Crimes
4807	police-refusing-aid-to	Refusing to aid an officer	all-other-crimes	All Other Crimes
4812	failure-to-report-abuse	Failure to report abuse	all-other-crimes	All Other Crimes
4813	police-disobey-lawful-order	Failure to obey a lawful order by police	all-other-crimes	All Other Crimes
4899	police-interference	Obstructing police	all-other-crimes	All Other Crimes
4901	escape	Escape of a prisoner	all-other-crimes	All Other Crimes
4903	escape-aiding	Aiding the escape of a prisoner	all-other-crimes	All Other Crimes
4999	escape-other	Escape or flight	all-other-crimes	All Other Crimes
5006	intimidation-of-a-witness	Intimidation of a witness	all-other-crimes	All Other Crimes
5007	obstruct-jud-court-order-vio	Obstructing a court order	all-other-crimes	All Other Crimes
5011	parole-violation	Parole violation	all-other-crimes	All Other Crimes
5012	probation-violation	Probation violation	all-other-crimes	All Other Crimes
5015	failure-to-appear	Failure to appear	all-other-crimes	All Other Crimes
5016	violation-of-restraining-order	Violation of a restraining order	all-other-crimes	All Other Crimes
5016	violation-of-court-order	Violation of a court order	all-other-crimes	All Other Crimes
5016	violation-of-custody-order	Violation of a court order	all-other-crimes	All Other Crimes
5099	obstructing-govt-operation	Obstruction of a government operation	all-other-crimes	All Other Crimes
5104	bribery	Bribery	all-other-crimes	All Other Crimes
5201	weapon-altering-serial-number	Altering the serial number	all-other-crimes	All Other Crimes
5202	weapon-carrying-concealed	Carrying a concealed weapon	all-other-crimes	All Other Crimes
5203	weapon-carrying-prohibited	Carrying a prohibited weapon	all-other-crimes	All Other Crimes
5206	explosive-incendiary-dev-use	Using an explosive/incendiary device	all-other-crimes	All Other Crimes
5207	explosives-posses	Possession of an explosive	all-other-crimes	All Other Crimes

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
5211	explosive-incendiary-dev-pos	Possession of an explosive/incendiary device	all-other-crimes	All Other Crimes
5212	weapon-poss-illegal-dangerous	Possession of an illegal/dangerous weapon	all-other-crimes	All Other Crimes
5212	weapon-by-prev-offender-powpo	Possession of a weapon - POWPO	all-other-crimes	All Other Crimes
5213	weapon-unlawful-discharge-of	Unlawful discharge of a weapon	all-other-crimes	All Other Crimes
5213	weapon-flourishing	Flourishing of a weapon	all-other-crimes	All Other Crimes
5214	weapon-unlawful-sale	Unlawful sale of a weapon	all-other-crimes	All Other Crimes
5215	bomb-threat	Bomb threat	all-other-crimes	All Other Crimes
5299	weapon-other-viol	Weapon - other	all-other-crimes	All Other Crimes
5302	riot-incite	Inciting a riot	public-disorder	Public Disorder
5303	riot	Engaging in a riot	public-disorder	Public Disorder
5305	police-interference	Police Interference	all-other-crimes	All Other Crimes
5307	riot-unlawful-assembly	Unlawful assembly	all-other-crimes	All Other Crimes
5309	harassment	Harassment	public-disorder	Public Disorder
5309	harassment-dv	Harassment - DV	public-disorder	Public Disorder
5309	harassment-obscene	Obscene harassment	public-disorder	Public Disorder
5309	harassment-sexual-in-nature	Harassment - sexual in nature	public-disorder	Public Disorder
5310	pub-peace-desecrate-symb	Desecrating the flag	all-other-crimes	All Other Crimes
5311	public-fighting	Public fighting	all-other-crimes	All Other Crimes
5312	disturbing-the-peace	Disturbing the peace	public-disorder	Public Disorder
5313	curfew	Curfew	public-disorder	Public Disorder
5314	loitering	Loitering	public-disorder	Public Disorder
5315	public-peace-vagrancy	Vagrancy	public-disorder	Public Disorder
5399	public-peace-other	Public peace - other	public-disorder	Public Disorder
5401	traffic-accident-hit-and-run	Traffic accident - hit and run	traffic-accident	Traffic Accident
5420	traffic-accident-dui-duid	Traffic accident - DUI-DUID	traffic-accident	Traffic Accident
5441	traffic-accident	Traffic accident	traffic-accident	Traffic Accident
5441	traffic-accident-sbi	Traffic accident - SBI	traffic-accident	Traffic Accident
5441	traffic-accident-fatal	Traffic accident - Fatal	traffic-accident	Traffic Accident
5441	traffic-accident-police	Traffic accident - Police	traffic-accident	Traffic Accident
5444	traf-habitual-offender	Habitual traffic offender	all-other-crimes	All Other Crimes
5450	traf-vehicular-homicide	Vehicular homicide	murder	Murder

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
5454	traf-impound-vehicle	Impound abandoned vehicle on right-of-way	all-other-crimes	All Other Crimes
5455	traf-vehicular-assault	Vehicular assault	all-other-crimes	All Other Crimes
5499	traf-other	Traffic offense - other	all-other-crimes	All Other Crimes
5499	vehicular-eluding	Vehicular eluding	all-other-crimes	All Other Crimes
5499	vehicular-eluding-no-chase	Vehicular eluding - no chase	all-other-crimes	All Other Crimes
5599	health-violations	Health & safety violations	all-other-crimes	All Other Crimes
5704	eavesdropping	Eavesdropping	all-other-crimes	All Other Crimes
5707	criminal-trespassing	Criminal trespassing	all-other-crimes	All Other Crimes
5799	wiretapping	Wiretapping	all-other-crimes	All Other Crimes
5801	contraband-possession	Possession of contraband	all-other-crimes	All Other Crimes
5802	contraband-into-prison	Smuggle contraband to prisoner	all-other-crimes	All Other Crimes
5999	election-law-violation	Election laws violation	all-other-crimes	All Other Crimes
6110	money-laundering	Money laundering	all-other-crimes	All Other Crimes
6199	tax-violations	Tax revenue violation	all-other-crimes	All Other Crimes
6201	animal-cruelty-to	Cruelty to animals	all-other-crimes	All Other Crimes
6205	illegal-dumping	Illegal dumping	all-other-crimes	All Other Crimes
6299	other-conservation-crime	Other conversation offense	all-other-crimes	All Other Crimes
6299	littering	Littering	all-other-crimes	All Other Crimes
6299	other-enviornment-animal-viol	Other environmental or animal offense	all-other-crimes	All Other Crimes
6299	animal-poss-of-dangerous	Possession of a dangerous animal	all-other-crimes	All Other Crimes
6300	money-laundering	Money laundering	all-other-crimes	All Other Crimes
7099	crimes-against-person-other	Crimes against a person - other	all-other-crimes	All Other Crimes
7099	homicide-conspiracy	Conspiracy to commit homicide	all-other-crimes	All Other Crimes
7099	homicide-solicitation	Solicitation to commit homicide	all-other-crimes	All Other Crimes
7099	reckless-endangerment	Reckless endangerment	all-other-crimes	All Other Crimes
7099	disarming-a-peace-officer	Disarming a peace officer	all-other-crimes	All Other Crimes
7099	homicide-accessory-to	Accessory to commit homicide	all-other-crimes	All Other Crimes
7199	property-crimes-other	Property crimes - other	all-other-crimes	All Other Crimes
7199	property-crimes-other	Property crimes - other	all-other-crimes	All Other Crimes
7299	morals-other-moral-off	Morals / decency offense - other	all-other-crimes	All Other Crimes

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
7399	public-order-crimes-other	Public order offense - other	all-other-crimes	All Other Crimes
7399	fireworks-possession	Possession of fireworks	all-other-crimes	All Other Crimes
7399	public-order-crimes-other	Public order offense - other	all-other-crimes	All Other Crimes
7399	accessory-conspiracy-to-crime	Accessory / conspiracy to crime	all-other-crimes	All Other Crimes
199	sovereign-treason-viol	Treason	all-other-crimes	All Other Crimes
399	immigration-violations	Immigration violation	all-other-crimes	All Other Crimes
902	homicide-family	Homicide by a family member	murder	Murder
903	hom-willful-kill-non-family-gu	Homicide by a stranger w/gun	murder	Murder
904	hom-willful-kill-nonfam-wp	Homicide by a stranger w/weapon	murder	Murder
907	homicide-police-by-gun	Homicide of a Police Officer w/gun	murder	Murder
908	homicide-police-weapon	Homicide of a Police Officer w/weapon	murder	Murder
910	homicide-negligent	Homicide by negligence	murder	Murder
911	hom-wilful-kill-gun	Homicide by gun	murder	Murder
912	homicide-other	Homicide by other means	murder	Murder
1003	kidnap-minor-to-sex-aslt	Kidnap minor to sexually assault	all-other-crimes	All Other Crimes
1004	kidnap-adult-to-sex-aslt	Kidnap adult to sexually assault	all-other-crimes	All Other Crimes
1005	kidnap-juvenile-victim	Kidnap a minor	all-other-crimes	All Other Crimes
1006	kidnap-adult-victim	Kidnap an adult	all-other-crimes	All Other Crimes
1006	kidnap-dv	Domestic violence kidnapping	all-other-crimes	All Other Crimes
1008	kidnap-abduct-no-ransom-aslt	Abduction without ransom or assault	all-other-crimes	All Other Crimes
1009	kidnap-hijack-aircraft	Hijack an aircraft	all-other-crimes	All Other Crimes
1010	kidnap-parental	Kidnapping by parent	all-other-crimes	All Other Crimes
1011	kidnap-minor-nonparental	Kidnapping of a minor by non-parent	all-other-crimes	All Other Crimes
1099	false-imprisonment	False Imprisonment	all-other-crimes	All Other Crimes
1101	sex-aslt-gun	Rape, perpetrator had a gun	sexual-assault	Sexual Assault
1102	sex-aslt-rape	Rape	sexual-assault	Sexual Assault
1102	sex-aslt-rape-pot	Rape by a person in a position of trust	sexual-assault	Sexual Assault



Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
1103	sex-aslt-strong-arm	Rape using the threat of violence	sexual-assault	Sexual Assault
1109	sex-aslt-non-rape	Unlawful sexual contact	sexual-assault	Sexual Assault
1109	sex-aslt-non-rape-pot	Unlawful sexual contact	sexual-assault	Sexual Assault
1112	sex-asslt-sodomy-boy-strng-arm	Sodomy of a male juvenile using bodily force	sexual-assault	Sexual Assault
1113	sex-asslt-sodomy-man-strng-arm	Sodomy of an adult male using bodily force	sexual-assault	Sexual Assault
1114	sex-asslt-sodomy-girl-strg-arm	Sodomy of a female juvenile using bodily force	sexual-assault	Sexual Assault
1115	sex-asslt-sodomy-woman-str-arm	Sodomy of an adult female using bodily force	sexual-assault	Sexual Assault
1116	sex-aslt-statutory-rape	Statutory rape	other-crimes-against-persons	Other Crimes Against Persons
1116	sex-aslt-statutory-rape-pot	Statutory rape by a person in a position of trust	other-crimes-against-persons	Other Crimes Against Persons
1199	sex-aslt-w-object	Sexual assault with an object	sexual-assault	Sexual Assault
1199	sex-aslt-w-object-pot	Sexual assault w/object by a person in a position of trust	sexual-assault	Sexual Assault
1201	robbery-business-gun	Robbery of a business using a gun	robbery	Robbery
1202	robbery-business	Robbery of a business using a weapon	robbery	Robbery
1203	robbery-busn-strong-arm	Robbery of a business using bodily force	robbery	Robbery
1204	robbery-street-gun	Robbery of a person in the open using a gun	robbery	Robbery
1205	robbery-street	Robbery of a person in the open	robbery	Robbery
1206	robbery-street-strong-arm	Robbery of a person in the open using bodily force	robbery	Robbery
1207	robbery-residence-gun	Robbery of a person in a residence using a gun	robbery	Robbery
1208	robbery-residence	Robbery of a person in a residence	robbery	Robbery
1209	robbery-resd-strong-arm	Robbery of a person in a residence using bodily force	robbery	Robbery
1210	robbery-purse-snatch-w-force	Forcible Purse Snatching	robbery	Robbery

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
1211	robbery-bank	Robbery of a bank	robbery	Robbery
1212	robbery-car-jacking	Carjacking - armed	robbery	Robbery
1299	robbery-other	Robbery - remarks	robbery	Robbery
1301	aslt-agg-family-gun	Assault causing serious bodily injury by a family member using a gun	aggravated-assault	Aggravated Assault
1302	aslt-agg-family-weapon	Assault causing serious bodily injury by a family member using a weapon	aggravated-assault	Aggravated Assault
1303	agg-aslt-strong-arm-dv	Assault causing serious bodily injury using bodily force - domestic violence	aggravated-assault	Aggravated Assault
1304	aslt-agg-non-family-gun	Assault causing serious bodily injury by a stranger using a gun	aggravated-assault	Aggravated Assault
1305	aslt-agg-non-family-weapon	Assault causing serious bodily injury by a stranger using a weapon	aggravated-assault	Aggravated Assault
1306	agg-aslt-strong-arm-nonfam	Assault causing serious bodily injury by a stranger using bodily force	aggravated-assault	Aggravated Assault
1310	aslt-agg-police-gun	Assault causing serious bodily injury of a police officer using a gun	all-other-crimes	All Other Crimes
1311	agg-aslt-police-weapon	Assault causing serious bodily injury of a police officer using a weapon	all-other-crimes	All Other Crimes
1312	agg-aslt-police-ofc-stng-arm	Assault causing serious bodily injury of a police officer using bodily force	all-other-crimes	All Other Crimes
1313	assault-simple	Assault causing minor bodily injury	other-crimes-against-persons	Other Crimes Against Persons
1313	assault-state	Assault causing minor bodily injury	other-crimes-against-persons	Other Crimes Against Persons
1313	assault-dv	Assault causing minor bodily injury - domestic violence	other-crimes-against-persons	Other Crimes Against Persons
1313	assault-police-simple	Assault causing minor bodily injury to a police officer	other-crimes-against-persons	Other Crimes Against Persons
1314	agg-aslt-gun-other	Assault causing serious bodily injury using a gun	aggravated-assault	Aggravated Assault
1314	weapon-fire-into-occ-veh	Weapon fired into an occupied vehicle	aggravated-assault	Aggravated Assault

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
1314	weapon-fire-into-occ-bldg	Weapon fired into an occupied building	aggravated-assault	Aggravated Assault
1315	aggravated-assault	Assault causing serious bodily injury	aggravated-assault	Aggravated Assault
1315	aggravated-assault-dv	Assault causing serious bodily injury - domestic violence	aggravated-assault	Aggravated Assault
1315	menacing-felony-w-weap	Threatening to imminently injure with a weapon	aggravated-assault	Aggravated Assault
1315	weapon-flourishing	Flourishing a weapon at another person	aggravated-assault	Aggravated Assault
1316	threats-to-injure	Threatening to injure	public-disorder	Public Disorder
1316	harassment-stalking-dv	Harassment by stalking - domestic violence	public-disorder	Public Disorder
1316	threats-city	Threatening to injure	public-disorder	Public Disorder
2005	arson-business	Arson of a business	arson	Arson
2006	arson-residence	Arson of a residence	arson	Arson
2007	arson-other	Arson	arson	Arson
2009	arson-public-building	Arson to a public building	arson	Arson
2099	arson-vehicle	Arson of a vehicle	arson	Arson
2101	extort-threat-inj-person	Extort-threaten to injure a person	all-other-crimes	All Other Crimes
2199	extortion	Extortion - other	all-other-crimes	All Other Crimes
2201	burglary-safe	Burglary of a safe	burglary	Burglary
2202	burglary-residence-by-force	Burglary of a residence with forced entry	burglary	Burglary
2202	burg-auto-theft-resd-w-force	Burglary and auto theft at a residence with forced entry	burglary	Burglary
2203	burglary-business-by-force	Burglary of a business with forced entry	burglary	Burglary
2203	burg-auto-theft-busn-w-force	Burglary and auto theft at a business with forced entry	burglary	Burglary
2204	burglary-residence-no-force	Burglary of a residence without forced entry	burglary	Burglary
2204	burg-auto-theft-resd-no-force	Burglary and auto theft at a residence without forced entry	burglary	Burglary
2205	burglary-business-no-force	Burglary of a business without forced entry	burglary	Burglary

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
2205	burg-auto-theft-busn-no-force	Burglary and auto theft at a business without forced entry	burglary	Burglary
2206	burglary-poss-of-tools	Possession of burglary tools	burglary	Burglary
2299	burglary-other	Burglary - other	burglary	Burglary
2301	theft-pick-pocket	Pocketpicking	larceny	Larceny
2302	theft-purse-snatch-no-force	Purse snatching without force	larceny	Larceny
2303	theft-shoplift	Shoplifting	larceny	Larceny
2304	theft-parts-from-vehicle	Theft of parts from a vehicle	theft-from-motor-vehicle	Theft from Motor Vehicle
2305	theft-items-from-vehicle	Theft of items from a vehicle	theft-from-motor-vehicle	Theft from Motor Vehicle
2307	burglary-vending-machine	Theft from a vending machine	larceny	Larceny
2308	theft-from-bldg	Theft from a building	larceny	Larceny
2309	theft-from-yards	Theft from a yard	larceny	Larceny
2310	theft-from-mails	Theft from a mailbox	larceny	Larceny
2311	larc-from-bank-type-inst	Theft from a bank	larceny	Larceny
2399	theft-other	Theft - other	larceny	Larceny
2399	theft-bicycle	Bicycle theft	larceny	Larceny
2399	theft-gas-drive-off	Theft of fuel by driving off without paying	larceny	Larceny
2399	theft-of-cable-services	Theft of cable services	larceny	Larceny
2399	theft-stln-veh-const-eqpt	Theft of construction equipment	auto-theft	Auto Theft
2399	theft-stln-vehicle-trailer	Theft of a trailer	auto-theft	Auto Theft
2402	theft-vehicle-strip	Vehicle stolen and stripped	theft-from-motor-vehicle	Theft from Motor Vehicle
2404	theft-of-motor-vehicle	Motor vehicle theft	auto-theft	Auto Theft
2411	theft-motor-veh-joy-ride	Unauthorized use of a vehicle or joy ride	auto-theft	Auto Theft
2501	forgery-checks	Forgery of checks	white-collar-crime	White Collar Crime
2503	forgery-counterfeit-of-obj	Counterfeiting an object	white-collar-crime	White Collar Crime
2503	altering-vin-number	Altering a vehicle VIN number	white-collar-crime	White Collar Crime
2504	forgery-pass-forged-obj	Passing forged documents	white-collar-crime	White Collar Crime

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
2505	forg-pass-counterfeit-obj	Passing counterfeited objects (tickets, bonds, etc)	white-collar-crime	White Collar Crime
2506	forgery-poss-of-forged-inst	Possession of a forged instrument	white-collar-crime	White Collar Crime
2506	forgery-poss-of-forged-ftd	Possession of a forged financial transaction device (credit & debit cards)	white-collar-crime	White Collar Crime
2507	forg-poss-counterfeit-obj	Possession of counterfeited objects (tickets, bonds, etc)	white-collar-crime	White Collar Crime
2508	forgery-posses-forge-device	Possession of counterfeiting device	white-collar-crime	White Collar Crime
2589	forgery-other	Forgery - other	white-collar-crime	White Collar Crime
2589	drug-forgery-to-obtain	Forgery to obtain drugs	white-collar-crime	White Collar Crime
2601	theft-confidence-game	Theft by confidence game	white-collar-crime	White Collar Crime
2602	theft-of-rental-property	Theft of rental property	white-collar-crime	White Collar Crime
2602	theft-fail-return-rent-veh	Failure to return rental vehicle	white-collar-crime	White Collar Crime
2604	fraud-identity-theft	Identity theft	white-collar-crime	White Collar Crime
2604	fraud-criminal-impersonation	Criminal impersonation	white-collar-crime	White Collar Crime
2604	fraud-gather-id-info-deception	Gathering personal information by deception	white-collar-crime	White Collar Crime
2604	fraud-possess-id-theft-tools	Possession of identity theft tools	white-collar-crime	White Collar Crime
2604	impersonation-of-police	Police impersonation	white-collar-crime	White Collar Crime
2605	theft-unauth-use-of-ftd	Unauthorized use of a financial transaction device	white-collar-crime	White Collar Crime
2605	fraud-unauthorized-use-of-ftd	Unauthorized use of a financial transaction device	white-collar-crime	White Collar Crime
2606	fraud-nsf-closed-account	Fraud by check due to insufficient funds	white-collar-crime	White Collar Crime
2607	fraud-by-telephone	Fraud by telephone	white-collar-crime	White Collar Crime

Offense Code	Offense Type ID	Offense Type Name	Offense Category ID	Offense Category Name
2608	fraud-by-wire	Fraud by wire	white-collar-crime	White Collar Crime
2609	fraud-by-use-of-computer	Fraud by use of computer	white-collar-crime	White Collar Crime
2699	fraud-other	Fraud - other	white-collar-crime	White Collar Crime
2699	failure-to-pay-cab-fare	Failure to pay cab, bus or rail fare	larceny	Larceny
2699	theft-of-meals	Theft of meals	larceny	Larceny
2699	theft-of-services	Theft of services	larceny	Larceny
2699	drug-fraud-to-obtain	Fraud to obtain drugs	drug-alcohol	Drug & Alcohol
2699	pawn-broker-viol	Pawn broker violation	all-other-crimes	All Other Crimes
2701	embezzle-bus-property	Embezzlement of business property	white-collar-crime	White Collar Crime
2799	theft-embezzle	Embezzlement by an employee	white-collar-crime	White Collar Crime
2801	stolen-property-sale-of	Sale of stolen property	all-other-crimes	All Other Crimes
2803	stolen-property-buy-sell-rec	Buy, sell or receive stolen property	all-other-crimes	All Other Crimes
2804	outside-steal-recovered-veh	Recovered vehicle stolen outside Denver	all-other-crimes	All Other Crimes