Assessing the Influence of Gambling on Public Safety in Massachusetts Cities and Towns

Crime Comparison Analysis of Changes in the MGM Springfield Region

2013-2022

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Executive Summary

<u>Context and Purpose</u>

MGM Springfield opened on 24 August 2018 in the midst of a dense, urban area with a historically higher-than-average, but decreasing, crime rate. This report covers changes in crime statistics for the surrounding cities and towns during the past decade and after the opening of the casino, with a particular focus on 2022. The report shows that only a few crimes increased in surrounding agencies during this period and the decade long trend of crime reduction continues on the same trajectory. While some of these increases have possible links to MGM, there is no general consistency across the surrounding agencies and limited evidence of a casino connection to specific offenders. What we do provide is a set of focus areas and patterns that local agencies can decide to focus on in terms of hotspots and seasonality.

The primary purpose of this report is to conduct an analysis of the crime distribution throughout the region surrounding MGM Springfield since the casino opened, to identify which changes in activity might be attributable to the casino, and to triage trends for more detailed analysis and response among the participating agencies.

Acronyms and abbreviations are provided in Appendix A.

<u>Condensed Methodology</u>

Data was collected from eight of the eleven agencies within the region. Three communities on the eastern fringe of Springfield were unable at this time to provide updated records at the time of this report. Crime continues to drop along the predicted trend lines in the majority of the region (see Figures 3 & 4 on pages 36 & 37). It should be noted that the Springfield MGM Casino is located in the heart of Central City or the central business district (CBD). Placing the casino within the CBD was intentional for economic development reasons and offered increased activity, surveillance, and social organization to an area already prone to high crime rates.

Data was collected from the records management systems (RMS) of the Springfield, Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Northampton, West Springfield, and the Massachusetts State Police. Hampden, Ludlow, and Wilbraham Police Departments who all share an RMS were unable to provide timely data for this analysis. Crimes, calls for service, and collisions during the period of the last decade (2013-2022) were utilized. The quality of the data was deemed accurate and represents the integrity of official crime and operational statistics of the participating agencies.

- The analysis focused on the larger pattern of crime in the past decade and the seasonal patterns that it represents. Like the previous report, researchers looked at hexagon hotspots to determine the geo-spatial patterns of crime distribution and used robust

graduated symbol maps to evaluate the distinct pattern of concentric zones and distance decay from the casino location and central city - Springfield[1].

- This research conducted a spatial analysis of crime counts across the study area using hexagon polygons[2] of equal size – approximately one-quarter-mile square areas. It used these sectors to compare high crime areas and describe the scope and nature of crime in them as compared to the hexagon encompassing the casino and those hexagons immediately contiguous to it. It compared several crime hotspots identified in the region. They will be used as benchmarks for future analysis. This report provides a report on drunk driving as reported by the Massachusetts State Police as a follow-up report to previous research done on impaired driving.
- Ten distinct hotspots in the region were identified and compared to the MGM hexagon, see pages 48-60 for a detailed discussion.
- Any significant increases were analyzed in more detail with available quantitative data.
- A statistical review of the expected downward trend was conducted to determine if specific crime categories were impacted beyond their expected trajectory.
- Additional micro-analysis was performed to fully ascertain crime and place. Pages 61-73 go into great detail of the micro analysis of crime in the Region.
- An on-site assessment was conducted to view the area and police personnel were contracted to gain insights into the contributing factors of these hotspots.

Major findings

- An important finding is that there was a significant increase in crime before the MGM Springfield Casino reopened after the mandated COVID-19 closure. Figure 7 (p.42) shows this chronological ordering, which suggests that the casino is not a primary cause of crime, but that other social, economic, or psychological factors have played a role in changes in crime patterns. For example, it is possible the strain of COVID-19 created an environment where motivated offenders sought relief from stress and/or economic hardship that led them to criminality, but a closed casino cannot be a factor.
- The City of Springfield has aggressively engaged in an urban redevelopment plan in refurbishing Union Station, beautified parks and outdoor space enticing public use, and has invested in police technology and a real time crime center that proactively addressed crime problems and prolific offenders.
- Crime in the MGM-Springfield area consistently followed a summer seasonal pattern of increase during warmer weeks. This is most likely not a surprise to police departments in the region but should serve as a reoccurring pattern that could guide proactive strategies in the summertime to address this regular increase in crime.
- Overall crime in the region steadily declined over the past 10 years with a slight uptick in 2022. Figure 6 (p.41) shows a leveling off in crime along the expected downward trend.

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[1] Concentric zones and distance decay are discussed further down in this report, page 18 and 21, respectively.
[2] Documentation for why hexagons are considered best practice in spatial analysis can be found here: https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-statistics/h-whyhexagons.htm

- The City of Springfield was impacted the most by crime in the region, ranging between 33% and 62% of specific crime categories in the area. Overall, Springfield accounted for 62% the crime in the region.
- Overall violent, property, and total crime followed a consistent pattern; albeit behaved, or should we say criminals behaved in routine and demonstrable patterns. Crime ebbed and flowed over time but stayed within a range that must be managed. This report should better help us understand this temporal pattern.
- The surrounding communities saw some increases and decreases but very few consistent trends to which MGM Springfield serves as a clear source. Issues most likely influenced by the casino include:
  - A clear summer seasonality spike in crime occurred in each year of this decade.
  - The COVID-19 pattern during pre-open, open, closure, and reopening followed the same pattern found in the Encore Boston Harbor research and we would refer you to this report for an in-depth discussion of the crime patterns before, during and after COVID-19. Most notably is that crime increased before the COVID closure ends, suggesting that something other than the casino or other venues (i.e., restaurants, bars, sporting events, schools, etc.) drove criminal activity. We hypothesize that motivated offenders look for opportunities under all circumstances, and economic circumstances and addictions drove their behavior regardless of the casino or restaurants/ bars being open.
  - Crime clearly reduced in frequency when establishments in the Region were closed due to COVID-19 but started to climb before the casino reopened. Once the casino did reopen, the crime levels did not return to levels before COVID-19 occurred.
  - MGM Springfield casino followed the classic conception of social disorganization theory and concentric zones, that is, crime is more prevalent in the core center areas and diminished as it got further away from Central City. Each crime type was evaluated and demonstrated the same or similar results, suggesting a structural aspect to crime and communities within the Springfield area.
  - This evidence suggests a strong correlation to the casino location, geographically. Correlation does not prove causation and most likely has a spurious or intermittent relationship with the casino, more likely dictated by socio-economic conditions.
  - Several other crime hotspots exist with as much crime as found in the Central City-Springfield area, and thus, illustrates that other criminogenic factors are at play other than a casino.
  - Fraud—specifically the fraud code that includes "swindles" and "con games"—was the only crime in the immediate MGM area to show both an unexpectedly high value and a value out of alignment with what the rest of the state experienced during the same period.
  - The crime of burglary showed a dramatic decrease in both Springfield and Massachusetts at large over the last decade.

- While drunk driving arrests were down 8% in the MGM Springfield Region, the area did report a 10% increase in traffic collisions that resulted in a drunk driving charge. "Last Drink" reports attributed to MGM Springfield had a slight increase from the historical average of 5.8 per year to 7 in 2022.
- Robbery was below its projected total in every community except Longmeadow (which only had 3). Both violent crime and vehicle crime remained normal in the area despite an uptick in the rest of the state.

- There were several common trends among the agencies for which no direct MGM nexus could be identified (e.g., an arrested offender known to visit the establishment) but which had a logical connection, a spatial connection, or both:
  - Shoplifting in East Longmeadow hit its highest total in a decade, a sudden reversal of a trend that had produced the decade's lowest total (29) in 2021. The increase was localized almost entirely at the Stop & Shop on North Main Street.
  - Continued patterns of purse snatching, this time in Springfield. Purse Snatching in Springfield hit a record high in 2022, rising to 59. The previous year was also high at 38; the decade average before that was only 13.
  - Vandalism in West Springfield was higher in 2022 than any year in the previous decade, and nearly 100 incidents higher than the 232 reported in 2021.

- Crime fell during the COVID closure—less because of MGM's closure specifically and more because of general societal changes during the period. In future analyses, it will become very difficult to untangle any MGM-specific influence from the changes brought by COVID-19 and other societal factors.

This COVID-19 pre-during-post period analysis provided us with a temporal and spatial view and perspective of crime in and around the MGM Springfield Casino. While the casino closure would normally provide an opportunity to conduct a pre-post closure assessment using time series analysis, so many other factors come into play during this chaotic period in America. Key factors included the fact that all restaurants, bars, entertainment venues, and schools were closed; and restrictions on health care facilities and hospitals reduced the number of social interactions in our communities, including the possibility for criminal interactions and traffic volume. The social stress of COVID-19, political protests because of George Floyd, and political unrest surrounding the 2020 election all contribute to varying levels of crime. Any study looking at crime and disorder is simply challenged by the reality that these events collectively affected our lives. It is virtually impossible to control for these contributing factors; and as such, this report offers benchmarks for future research and a starting point for understanding the scope and nature of crime in the region. Patterns of crime in the State, the region and within comparable hotspots will allow us to monitor crime going forward.

Conclusion

Overall crime around the MGM Springfield Casino continued to drop along the consistent trend line for the entire decade. Distinct summer-time seasonality occurred each year with the exception of a lag that occurred during the COVID-19 summer closure.

Developing mitigation strategies and collaborative initiatives appears to be feasible, given the shared similarities in crime types and temporal patterns. It makes sense to collaborate and focus on specific crimes since evidence-based policing tells us the same prolific offenders tend to be responsible for the majority of crime and that crime clusters in distinct areas. Sharing timely intelligence and responding with effective and unified solutions represents a sound practice for the future. Putting officers in the right place at the right time is feasible when utilizing sound crime analysis.

Future research calls for critical thinking about certain crimes that are associated with casinos. Certainly as patrons visit the casino, cash related crimes like street jump robbery and theft from autos are more likely. Identity theft from thieves stealing documents from parked cars in structures and street parking have clear correlates. Large venues like sporting events and conference championships draw wealthy clientele, and with-it certain types of crime and scams. Prostitution and human trafficking, as difficult as they are to discern and investigate, remain high priorities. Drunk driving merits ongoing attention given the strong relationship between adult entertainment and alcohol consumption. But as the data suggested, all the jurisdictions within the region, share common crime and disorder problems, and a collaborative and problem-solving approach merits strong consideration. It is very likely that each city is dealing with a similar pattern of a small number of prolific offenders, and hotspots with common contributing attributes.

Introduction

In a review of the effects of casinos on crime in host communities, Sutton (2003) summaries the research[3] of Stint et al (2003) and concluded that:

> "...no definitive statement can be made about the effect casinos have on crime and that there are likely to be some contextual factors operating in some communities, that allow for casinos to positively affect crime under certain as yet unknown circumstances. At the same time, there is also no way of knowing whether the apparent casino effect, when present, is a direct one. When a casino opens in a community, it often changes the nature of the community in a multitude of ways, both positive (stimulating the economy and adding employment and entertainment) and negative (adding traffic congestion and introducing large numbers of non-residents). The authors found it is the interplay of these and other factors, such as location, size, number of casinos, state gambling regulations and law enforcement policies, that may determine the effect of the casino on crime in the community. If crime has increased, is it due to casino-related factors or increased tourism (which has been linked to increases in crime in other studies)?"

Our assessment of MGM Springfield could not agree more at this point in time. Others point to the paucity of available research over the past 30 years that simply do not offer robust methodologies or the quality of data to definitively proclaim that casinos cause crime. The Massachusetts Gaming Commission and its research agenda provides us with the opportunity to study crime and place within a geo-historical context. This report will not come close to answering this important research question but does continue to lay the groundwork for better understanding the geo-spatial relationship of crime in and around casinos and provide insights and best practice for responding to crime and disorder. The authors of this report want to thank MGC for providing the opportunity to be part of this endeavor and to contribute to this body of literature. These series of studies lay the groundwork for improving research methods and applied criminological perspectives on crime in vulnerable locations. We remain completely neutral on the research question at hand and hope to play a role in building our knowledge.

PURPOSE OF THIS REPORT

The intention of these analyses is to demonstrate, comprehensively, whether changes in crime, disorder, and other public safety harms can be attributed directly or indirectly to the introduction and operation of a casino and what strategies local communities need to implement to mitigate any such harm. Justice Research Associates collaborate with the Commission and select law enforcement agencies in casino host and surrounding communities to examine changes in crime patterns, calls for service[4], and motor vehicle collisions following the opening of the casinos in

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[3] Sutton (2003) Journal Article Review of "Does the Presence of Casinos Increase Crime? An Examination of Casino and Control Communities," by B. Grant Stitt, Mark Nichols, and David Giacopassi, 2003. *Crime & Delinquency*. Vol. 49 (2): 253.

[4] Calls for service definitions are provided in Appendix B.

their respective regions. Data and reports generated from this work will support key aspects of the Gaming Research Agenda outlined in G.L. c. 23K, Section 71.

It is our understanding that this body of research is meant to inform public safety agencies in Massachusetts about the relationships between crime and casinos and provide area commanders with thought provoking strategies and problem-solving ideas that they may elect to deploy.

The primary purpose of this report is three-fold.

- Number 1 - Conduct an analysis of the increases and decreases in activity in the communities surrounding MGM Springfield casino over six distinct timeframes:
  - prior to the casino opening (Pre-Open),
  - while it was open pre-covid (Open),
  - during the covid closure (Closed),
  - during restricted operations,
  - time since returning to full operations (Reopen) on May 30 '22, and
  - over the entire decade data is available - 2013 to 2022.

The goal here is to establish whether MGM Springfield demonstrated a different temporal pattern of crime compared to Encore. This report, like previous ones, alert participating agencies to trends (whether or not "caused" by MGM) and identify patterns for future detailed analysis in later reports. Comparisons were made to ascertain the degree to which casino operations and general COVID-19 closures impacted crime and call levels.

The period covered by this report compares 7-day cycles for the 81 weeks before MGM opened (as a pre-opening baseline) to the 81 weeks the casino was open from August 24, 2018 until it closed on March 14, 2020 due to COVID-19. It will then compare weekly averages for crime counts using these same cycles for the 17-week period the casino was closed from March 15, 2020 until July 11, 2020 when it reopened with capacity and distancing restrictions. Finally, this report will compare these rates of activity since fully reopening on May 30, 2021 until December 31, 2022 (83 weeks) and compare it to crime rates across these periods. This report provides a time series analysis of these different periods standardized by 7-days. We elected not to do a crime specific breakdown because the same COVID-19 pattern was established. Researchers turned our focus on crime specific hotspots and the clear pattern of crime diminishing the further locations got away from Central City and the casino.

	Pre-Open	Open	Closed.	Restricted.	Reopen
Time Frame	2/03/17	8/24/18	3/15/20	7/12/20	5/30/21
	8/23/18	3/14/20	7/11/20	5/29/21	12/21/22
	81 Weeks	81 Weeks	17 Weeks	46 Weeks	83 Weeks

- <u>Number 2</u> - Provide insight into the temporal and spatial patterns of crime in jurisdictions surrounding MGM. It begins with a broad macro analysis, followed by a drill down into the data at a local level and compares across them. It is a process of deductive reasoning, if you will, that allowed us to compare MGM Springfield to the overall changes and to each of the surrounding jurisdictions. The spatial micro-analysis used hexagons to drill down further into quarter-mile sections throughout the region.

- <u>Number 3</u> - Use Environmental Systems Research Institute's (ESRI) ArcGIS Pro to produce dynamic graduated symbol maps for each crime category and evaluate the spatial patterns of distribution. This approach provided the researchers the opportunity to explore a range of methods, software and other tools that have been developed to analyze large volumes of crime and establish optimal methodology for future analyses. This approach helped identify hotspots within hotspots.

This report does not generally attempt to answer broad questions about whether MGM "caused" increases, or its closure caused decreases in the area. It simply identifies the trends across our focused periods of pre-opening, open, closed, restricted and reopened cycles and looks for contributing factors and geographic explanations for high and low activity throughout the decade for which we have data. It does provide evidence of support for Shaw and McKay's social disorganization theory that crime decreases from the Central City and diminishes the further it gets away from its nucleus. Future analysis will attempt to ascertain the causal factors and correlates related to crime in proximity to the casino and in relationship to other contributing factors found during our onsite visit.

The following key concepts lay the foundation for our approach.

Crime Triangle

Like the elements of a fire (i.e., oxygen, fuel, and a spark), all three of these crime factors (Victim, Offender, and the lack of a capable guardian at the same time and place) need to be present for a crime to occur (Cohen and Felson. 1979; Clarke and Eck, 2016). Sherman et al. (1989) is one of the first to apply Routine Activity Theory to hotspots, consistently showing how crime congregates in succinct places.
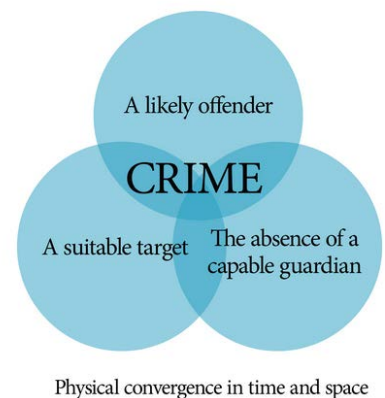
Best practice, according to the Problem Oriented Policing DOJ funded initiative, calls for solutions that are focused on distinct areas or hotspots and that are multifaceted in nature, which prove to be more successful. Future analysis will attempt to offer a more robust understanding of the scope and nature of crime in these hotspots so that local agencies can leverage their resources towards micro-solutions that can be measured and replicated (Scott & Kirby, 2012).

Research Methods

The research methods used during this analysis included Geographic Information Systems (GIS) software called ArcGIS Pro, a spatial analysis tool for understanding crime and place, particularly crime hotspots and micro-level analysis. A technique we call Detailed Hexagon Clustering was used to identify and drill down on crime within these hotspots to better understand the scope and nature of crime within these areas. Another relatively new ArcGIS tool called *Aggregate Clustering* was utilized to dynamically visualize hotspots. Graduated point symbols were used to aggregate and disaggregate the data dynamically as you zoom in and out. You can easily create and evaluate hotspots within hotspots and pinpoint the source of the issue. Researchers used *Clustering* and Google maps to find underlying businesses or features that might be contributing factors within the targeted area. Several hotspots were compared to the MGM hotspot and illustrated that crime volumes at or around the casino area also have high frequency of specific crimes, thus showing various contributing factors.

A technique called Risk Terrain Modeling (RTM) and Environmental Systems Research Institute (ESRI) Business Analyst tool were used to develop Profiles for each hexagon hotspot to assess the demographic makeup of the area. This allowed the researchers to compare the MGM hotspot to other crime hotspots and assess their similarities and differences in socio-economic terms. Future analysis will attempt to assess the risk and protective factors within communities as they relate to crime prevention and mitigation. A brief discussion of RTM can be found at the end of this report.

Tableau data visualization software was utilized to evaluate the time series analysis over six distinct periods: (1) Pre-casino opening, (2) Open, (3) Closed due to COVID-19, (4) Restricted Reopening, (5) Reopen; and the entire decade annually. This report focused on the nature of crime and space, using these techniques to investigate various crime categories in the entire region, within each jurisdiction and, finally, at the micro-level of several hexagon hotspots. This deductive approach and its findings provided a step-by-step drill down into the data to look for trends and patterns in an historical, temporal, and spatial context. The major findings of this effort can be found on pages 36-84.

Researchers also conducted an on-site qualitative assessment and observed first-hand and took photos of crime hotspot locations to get a better appreciation for the spatial and social dimensions of crime and place in Springfield and surrounding communities. The insights were quite informative. Photos are offered in the Results section to enhance the analysis.

Project Overview

Background

In 2014, the Massachusetts Gaming Commission, to better assess the impacts of new gaming facilities across the state, commissioned a series of efforts to study, assess, and prepare for the social and economic impacts of gambling. Primary work in this area is being done by the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) study at the University of Massachusetts Amherst School of Public Health & Health Sciences, drawing upon research and experiences in many other states. For public safety issues, the MGC contracted with researchers with direct experience analyzing the crime, call-for-service, and collision records collected daily by Commonwealth police agencies.

While many studies had attempted to study the effects of gambling on overall rates for serious crimes, aggregated annually, very few studies have attempted to analyze more specific and minute changes in public safety activity following the opening of casinos, including variations by hour, month, and season, changes in patterns and hot spots, and changes in non-crime activity such as traffic collisions and calls for service. The MGC was interested in the answers to these questions—in analyzing public safety at a level of detail that would help the police anticipate and respond to emerging problems.

In 2014, the MGC contracted with a career crime analyst, the author of several previous reports, to extract data from the agencies likely to be affected by the opening of Massachusetts's new casinos, and to design a process for assessing changes in those agencies' activity on a periodic basis. Work began in 2015 with baseline and first-quarter analyses of the Plainville area, where Plainridge Park opened in June. A new phase began in 2018, when MGM Springfield opened in August, and a third in 2019, when Encore Boston Harbor opened its doors to the public. This effort produced four (4) reports on MGM prior to this report.

In 2022, MGC contracted with Justice Research Associates (JRA) to continue this line of inquiry. JRA is a research consulting firm that specializes in applied research focusing on spatial and temporal analysis of crime and calls-for-service. Constructive feedback and questions can be directed to Dr. Noah Fritz by sending an email to njfritz@gmail.com. Previous reports are available online at massgaming.com.

Table 1 below lists all previous reports assessing changes in crime and police activity related to the three Massachusetts casinos, with this November 2023 report listed last.

Table 1: Publicly issued and planned reports on changes in crime and police activity

Issued	Report	Notes
August 2015	Report on baseline activity at Plainville area agencies	Established statistical measures for post-casino comparison
November 2015	Evaluation of change in police data after the first three months of Plainridge Park Casino	Few changes discernible in the immediate 3 months.
April 2016	Analysis of changes in police data after the first six months of operation at Plainridge Park Casino	Identified traffic-related calls for service as likely related to PPC. Noted increases in fraud crimes.
December 2016	Analysis of changes in police data after the first year of operation at Plainridge Park Casino	Continued to note increases in traffic-related calls; established credit card fraud increases as "likely related."
December 2017	Analysis of changes in police data after the first 2 years of operation at Plainridge Park Casino	Most comprehensive report so far. Included comparative analysis of control areas.
June 2018	Report on baseline activity in Springfield-area agencies	First report in preparation for MGM casino.
December 2018	Three-year analysis of Plainridge Park area.	Includes comprehensive traffic study
September 2019	Eight-month analysis of MGM Springfield	Showed increases in traffic collisions and complaints but few crimes increase.
September 2019	Baseline analysis of Encore Boston Harbor area	First report on this casino
October 2019	Four-year analysis of Plainridge Park	Final Plainridge Park reports shows few public safety issues attributable to the casino.
February 2020	One-year analysis of MGM Springfield	MGM is shown to be potentially related to some traffic issues and small patterns in specific communities.
March 2020	Six-month analysis of Encore Boston Harbor	Like MGM, Encore itself is busy, but has few detectable influences on surrounding area.
February 2021	18-month analysis of MGM Springfield	First report to cover COVID-era closings.
March 2021	1-year analysis of Encore Boston Harbor	Second report to cover COVID-era closings.
April–June 2021	Special reports on drunk driving, casino-based crime, and the MGM 2-year report	Special Report on MGM
January 2023	Assessing the Influence of Gambling on Public Safety in Massachusetts Cities and Towns During the COVID-19 Pandemic	Third report to cover COVID-era closings and the weekly time series analysis of pre-to-post Covid periods.
November 2023	*Crime Comparison Analysis of Changes in the MGM Springfield Region* – 2023	Third report to cover MGM looking specifically at crime hotspots and COVID-19 closure effects

Literature Review

A small body of literature exists for criminological studies of gambling and crime. There has been no research to our knowledge up to the time of this publication that has studied crime around casinos during COVID-19[5]. The previous methodology for inquiry ranges from entire cities being compared to control areas (Stitt et al., 2003; Barthe & Stitt, 2009; Ochrym. 1990).

The relationship between casinos and crime is a complex and debated topic. While some studies suggest a correlation between the presence of casinos and an increase in certain types of crime, it is important to consider several factors and nuances.

Proponents of the idea that casinos cause crime argue that the gambling industry can attract criminal elements, such as money launderers, loan sharks, and organized crime syndicates. Additionally, they argue that the influx of cash and the high-stakes environment can lead to increased levels of theft, fraud, and other criminal activities. There have been cases where criminal activity has been associated with casinos, such as money laundering schemes or illegal gambling operations.

On the other hand, opponents argue that well-regulated and properly managed casinos can mitigate the risks of criminal activity. They point out that legalized gambling establishments are subject to strict regulations, surveillance, and security measures, which can deter potential criminals. Furthermore, they argue that casinos can have a positive impact on local economies by generating jobs, tax revenue, and tourism.

It's worth noting that the research on this topic has produced mixed results, and there isn't a consensus among experts. Some studies have found a positive association between casinos and crime rates, while others have found no significant correlation. The impact of casinos on crime can also vary depending on the specific location, the regulatory framework, and the social and economic context.

In summary, while there are arguments suggesting that casinos may contribute to certain types of crime, the relationship is complex and context dependent. The presence of casinos alone cannot be solely blamed for an increase in crime, as multiple factors influence crime rates in any given area.

Understanding the relationship between crime and place has become a critical function of modern police work. Hotspot policing and proactive responses to crime problems are a relatively contemporary endeavor. Problem oriented policing (Goldstein, 1990) offers a systematic scientific approach to reducing crime and disorder.

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[5] COVID-19 refers to the specific time frame for the first verified case of COVID-19 and throughout the period Massachusetts lifted COVID-19 restrictions. To our knowledge, we have found no specific research that studied crime around casinos as a result of COVID and simply acknowledge that more research is needed.

Our analysis draws on ecological social theory and environmental criminology to better understand the context of crime and place. Social disorganization theory, concentric zones, and the concept of central city helps us understand crime in a more structural way, while environmental criminology concepts like Routine Activity, Crime Patterns, distance decay and activity space provide a social context for visualizing why crime occurs when and where it does. We offer these important concepts in more detail as we assess crime hotspots and temporal patterns within the region.

To be clear, social disorganization theory provides a theoretical construct that is grounded in criminological theory. It suggests that there is something structural about the way communities are socially constructed that creates an environment where crime concentrates in the central city and diminishes as one gets further away from it. From a crime prevention and strategic enforcement standpoint, recognizing the consistency of this phenomenon lends strength to deployment and policy decisions. While many police departments intuitively recognize these criminogenic factors, social disorganization theory provides an evidence-based foundation for addressing crime in a proactive way.

Key Concepts

Social disorganization theory (SDT) (Shaw and McKay, 1942) is a criminological perspective that seeks to explain the occurrence of crime and deviance within certain communities or neighborhoods. The theory suggests that crime rates are influenced by the social and structural characteristics of a community rather than individual-level factors.

Social disorganization theory was developed by sociologists at the University of Chicago in the early 20th century, notably Robert E. Park, Ernest Burgess, and Clifford Shaw. It emerged as a response to the observation that certain neighborhoods had persistently high crime rates despite changes in the composition of the population. The theory suggests that it is the social and structural conditions of the community that contribute to crime, rather than the individual characteristics of its residents.

According to social disorganization theory, when a community experiences a breakdown in social control mechanisms and faces various social problems, it becomes "disorganized." These social problems can include poverty, residential mobility, ethnic heterogeneity, family disruption, and a lack of cohesive community organizations. The disorganization of a community can lead to weakened social bonds, a decline in informal social control, and a higher likelihood of criminal behavior.

The theory posits that in disorganized communities, individuals may be less likely to form strong social ties, trust their neighbors, or participate in community activities. As a result, informal mechanisms of social control, such as shared values, social norms, and collective supervision, are weakened. The absence of these social controls increases the chances of criminal behavior as individuals are less likely to be deterred from committing crimes or to receive social support that discourages such behavior.

It's important to note that social disorganization theory is just one among several theories that seek to explain the causes of crime and deviance. While it highlights the impact of community factors, other theories focus on individual traits, social learning, strain, or rational choice, among other factors. Criminologists often explore a combination of these theories to gain a more comprehensive understanding of crime and its underlying causes. Social disorganization theory helps us explain why crime perpetuates in some neighborhoods and not in other locations. Springfield has a long history of neighborhoods that are prone to these social attributes and reflect the very essence of the central city perspective (discussed later).

Social Disorganization Theory provides the structural explanation for the spatial distribution of crime; and provides us with causal factors for areas of high crime. We use these causal factors to compare various crime hotspots and distance decay within MGM region. Casino related crime, the primary focus of this research effort, has previously fallen into two potential explanations: (1) casino patrons and their property are targets of crime as opportunities present themselves and (2) chronic gamblers turn to crime to offset their losses or feed their addiction. Criminological explanations (theory) of crime are grounded in psychological (micro) theories or socio-political (macro) theories. Most micro explanations do not serve the police in developing operational or crime prevention strategies to address or respond to it.

Identifying crime hotspots (areas with high levels of crime) that do not have casinos within them or near them must have other contributing factors. We use these concepts to compare across various hotspots in the region. Several Problem Oriented Policing (POP) Guides[6] walk crime analysts and police area commanders through a systematic process for fighting crime-specific issues. Ratcliffe (2019) offers several distinct models and useful systematic strategies to reduce crime.

Social Disorganization Theory has been used to inform crime prevention strategies by identifying areas with high levels of social disorganization and implementing measures to strengthen social institutions and promote community involvement in crime prevention. For example, community policing programs may be implemented to increase police presence and build relationships between police and residents, or community development programs may be implemented to address underlying social and economic factors that contribute to crime.

Studies[7] have been conducted to evaluate the relationship between crime and casinos. While some studies have suggested a positive relationship between the two, others have found no significant correlation. One explanation for the positive relationship is that casinos attract both visiting and resident criminals. However, other studies[8] have argued that the relationship between casinos and crime is not causal, but rather a reflection of the increased police

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[6] https://popcenter.asu.edu/pop-guides
[7] https://walkerd.people.cofc.edu/pubs/JGBE_GM.pdf
[8] https://www.casino.org/blog/why-is-gambling-associated-with-crime/

presence and reporting of crime in areas with casinos. More research is needed to fully understand the relationship between crime and casinos.

Overall, Social Disorganization Theory provides a useful framework for understanding the relationship between crime and the social and economic conditions of a particular neighborhood or community and can help inform crime prevention strategies by targeting resources to areas with high levels of social disorganization.

Concentric zones, in the context of criminology, refer to the spatial patterns and organization of a city or urban area. This concept is closely associated with the ecological theory of crime developed by sociologists at the University of Chicago, particularly Ernest Burgess (1925). Concentric zones, as a social construct, will be used to assess distance decay (discussed below) and is presented here to help explain the concentration of crime in Central City and its diminishing distribution as it moves outward through these different zones. This ecological theory is presented to explain how and why crime clusters closer to Central City and diminishes the further away one gets from it. In regard to the MGM Casino, it resides by design and as part of urban renewal within the central business district, not as a contributing factor necessarily to crime production.

According to the concentric zone theory, cities can be divided into distinct concentric rings or zones, each characterized by different social and economic characteristics. The theory proposes five concentric zones:

1. Central Business District (CBD): The innermost zone, which includes the downtown area and serves as the economic and commercial hub of the city. This zone is typically characterized by high population density during the day due to the presence of businesses, offices, and retail establishments. However, residential population tends to be low in this zone. Some casino researchers refer to this zone as Central City.
2. Transition Zone: Located just outside the CBD, the transition zone is marked by a mix of residential, commercial, and industrial land uses. This zone often experiences social and economic instability, including high levels of poverty, crime, and residential mobility. It is where older, deteriorating housing may be found and where newly arrived immigrants or marginalized populations tend to settle.
3. Working-Class Zone: Beyond the transition zone, the working-class zone consists of neighborhoods with modest, single-family homes occupied by blue-collar workers. This zone is often characterized by a stable but economically struggling population, with relatively lower crime rates compared to the transition zone.
4. Residential Zone: This zone comprises middle-class residential neighborhoods. It typically consists of more spacious homes, better infrastructure, and a higher quality of life. The residents in this zone tend to have higher incomes and experience lower crime rates compared to the previous zones.
5. Commuter Zone: The outermost zone, primarily composed of suburban areas, where individuals commute to work in the city but reside outside of it. This zone typically

exhibits low population density and is characterized by a mix of residential, commercial, and recreational land uses.

The concentric zone theory suggests that crime rates and social problems are highest in the innermost zones, such as the transition zone, due to the socio-economic challenges and disorganization associated with these areas. As one moves outward into the more residential and affluent zones, crime rates tend to decrease. Others have coined this inner region as Central City and used it to look at casinos (Buck, A.J., et al, 1991).

It's important to note that while the concentric zone theory provides a framework for understanding the spatial distribution of crime, it is not without criticism. Critics argue that the theory oversimplifies the complexity of urban areas and may not fully account for other factors influencing crime, such as individual characteristics and social processes. Nonetheless, the concept of concentric zones has been influential in shaping our understanding of the relationship between urban environments and crime patterns.

Environmental criminology[9] is a branch of criminology that focuses on the relationship between crime and the environment. It examines how various environmental factors, such as the design of physical spaces, social and economic conditions, and cultural norms can contribute to the occurrence of crime.

One of the key principles of environmental criminology is the idea that crime is not solely the result of individual choices or actions but is also influenced by the environment in which it occurs. For example, research[10] has shown that certain types of physical environments, such as poorly lit areas or areas with high levels of foot traffic, can increase the risk of crime. Additionally, environmental criminology recognizes the importance of social factors, such as poverty and inequality, in shaping patterns of crime and victimization.

Environmental criminology[11] has been used to inform crime prevention strategies, such as the design of buildings and public spaces to reduce opportunities for crime, and the implementation of community development programs to address underlying social and economic factors that contribute to crime.

Routine Activity Theory[12] is a criminological theory that explains the occurrence of crime based on the convergence of three elements: motivated offenders, suitable targets, and the absence of capable guardians. The theory suggests that crime is more likely to occur when these three elements are present in the same place and at the same time.

According to the theory, motivated offenders are individuals who have the desire and ability to commit crime, suitable targets are objects or people that are attractive to offenders, and

[9] Brantingham and Brantingham, (1990)
[10] https://www.tandfonline.com/doi/abs/10.1080/19434472.2017.1365901
[11] https://www.sciencedirect.com/science/article/pii/S0749379711002941
[12] Eck and Clark (2003) and Felson, Marcus (2002)

capable guardians are individuals or systems that can prevent crime from occurring. For example, a house left unoccupied for an extended period of time may be a suitable target for burglary, especially if the house is located in an area with low levels of police presence or neighborhood watch programs.

Routine Activity Theory suggests that changes in any of these three elements can affect the likelihood of crime. For example, increasing the number of capable guardians in a particular area may reduce the likelihood of crime, while decreasing the number of suitable targets may also reduce crime. This theory has been used to inform crime prevention strategies by identifying areas with high levels of crime and implementing measures to increase the presence of capable guardians, reduce the attractiveness of potential targets, and deter motivated offenders from committing crimes in those areas.

Overall, Routine Activity Theory provides a useful framework for understanding the relationship between crime and the environment in which it occurs.

Crime Pattern Theory[13] is a criminological theory that explains the occurrence of crime based on the spatial and temporal patterns of criminal activity. The theory suggests that crime is not randomly distributed, but rather occurs in predictable patterns based on factors such as the location of potential targets, the presence of capable guardians, and the routine activities of potential offenders (obviously linked to Environmental Criminology and Routine Activity).

According to Crime Pattern Theory, crime is more likely to occur in areas where potential targets are concentrated and where there is a lack of capable guardians to prevent crime. Additionally, the theory suggests that crime is more likely to occur during periods of time when potential offenders have the opportunity and motivation to commit crimes, such as when they are not occupied with other activities or during seasons when people are active (summer).

Crime Pattern Theory has been used to inform crime prevention strategies by identifying areas where crime is likely to occur and implementing measures to increase the presence of capable guardians, reduce the attractiveness of potential targets, and deter potential offenders from committing crimes in those areas. For example, police may increase patrols in areas with high levels of criminal activity or implement lighting and surveillance measures to increase the perception of risk for potential offenders.

Overall, Crime Pattern Theory provides a useful framework for understanding the spatial and temporal patterns of crime and can help inform crime prevention strategies by identifying areas where crime is likely to occur and targeting resources to those areas.

Distance Decay Theory[14] is a geographic theory that explains how the frequency and intensity of interactions between two places decreases as the distance between them increases. The theory suggests that the likelihood of interaction between two places decreases as the

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[13] Brantingham and Brantingham (1990, 1993). Buck, et al., (1991).
[14] Cantor, David (2002)

distance between them increases, due to factors such as transportation costs, time, and effort required to travel between the two places.

In criminology, Distance Decay Theory has been used to explain the relationship between crime and distance from the offender's home or base of operation. The theory suggests that offenders are more likely to commit crimes closer to their home or base of operation, due to factors such as familiarity with the area, ease of access, and reduced transportation costs.

This theory has been used to inform crime prevention strategies by identifying areas where offenders are likely to operate and implementing measures to increase police presence and surveillance in those areas. For example, police may increase patrols in areas near known offender residences or known areas of criminal activity. Overall, Distance Decay Theory provides a useful framework for understanding the spatial patterns of crime and can help inform crime prevention strategies by identifying areas where crime is likely to occur and targeting resources to those areas.

Crime and Activity Space[15] is a criminological theory that explains how an individual's routine activities and spatial patterns can influence their risk of victimization and involvement in criminal activity. The theory suggests that an individual's activity space, which includes the places they regularly visit and the routes they take to get there, can create opportunities for criminal activity and increase their risk of victimization.

According to Crime and Activity Space theory, an individual's activity space can be divided into three components: nodes, paths, and edges. Nodes are places where an individual spends a significant amount of time, such as their home or workplace. Most people spend most of their time where they work, play or live and along routes between them. Paths are the routes an individual takes to travel between nodes, such as their daily commute. Edges are the boundaries between different activity spaces, such as the border between two neighborhoods.

Crime and Activity Space theory has been used to inform crime prevention strategies by identifying areas where individuals are most likely to be victimized or involved in criminal activity. For example, police may increase patrols in areas where there are high levels of pedestrian traffic or implement lighting & surveillance measures along popular walking routes.

Overall, Crime and Activity Space theory provides a useful framework for understanding how an individual's routine activities and spatial patterns can influence their risk of victimization and involvement in criminal activity and can help inform crime prevention strategies by targeting resources to areas and situations where individuals are most vulnerable.

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[15] Brantingham and Brantingham, (1993); Felson (2002 and Wiles (2000)

Hotspot policing[16] is a strategy used by law enforcement to target high-crime areas or "hotspots" with increased police presence and resources. The goal of hotspot policing is to prevent crime by deterring potential offenders and increasing the likelihood of apprehension for those who do commit crimes in the targeted areas.

Research[17] has shown that hotspot policing can be an effective strategy for reducing crime in targeted areas, particularly when combined with other crime prevention strategies such as community policing and problem-oriented policing. However, some critics have raised concerns about the potential for hotspot policing to lead to over-policing and discriminatory practices, particularly in communities of color.

Overall, while hotspot policing can be an effective tool for reducing crime, it is important for law enforcement agencies to use it in a responsible and equitable manner.

Journey to Crime[18] is a criminological theory that explains how an offender's and a victim's. movements and activities leading up to the commission of a crime can influence the likelihood and nature of the crime. The theory suggests that the participant's journey to commit a crime involves a series of decisions and actions that can be influenced by factors such as the personal characteristics, the availability of suitable targets, and the presence of capable guardians.

According to Journey to Crime theory, the offender's journey to the crime scene can be divided into four stages: pre-crime, commission, aftermath, and escape. During the pre-crime stage, the offender makes decisions about whether to commit a crime and selects a suitable target. During the commission stage, the offender carries out the crime. During the aftermath stage, the offender may attempt to conceal evidence or flee the scene. During the escape stage, the offender attempts to leave the area without being detected by law enforcement or other capable guardians.

Journey to Crime theory has been used to inform crime prevention strategies by identifying areas where offenders are likely to travel and implementing measures to increase the presence of capable guardians and reduce the attractiveness of potential targets. It is most useful to determine the time and manner in which the victim's journey overlaps with the offender's journey to crime, which provides useful leads to who the perpetrator might be.

Overall, Journey to Crime theory provides a useful framework for understanding the decision-making process that leads to the commission of a crime and can help inform crime prevention strategies by targeting resources to areas and situations where offenders are most likely to make the decision to commit a crime.

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[16] Sherman (1989 and 1995) and Lum (2008)
[17] https://www.ncjrs.gov/pdffiles1/nij/grants/209731.pdf

[18] Cantor, David (2004) and Wiles (2000).

Methodology

Data Collection

Data was collected from the records management systems (RMS) of the Springfield, Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Northampton, West Springfield, and the Massachusetts State Police. The three communities on the eastern fringe of Springfield were unable to provide timely data because permission was not forthcoming because changes were being made to their CAD and records management system infrastructure. Previous years' data suggested that these agencies only account for a small percentage of crime in the region and, as such, do not impact the results of this analysis. Crimes, calls for service, and collisions during the period of the last decade (2013-2022) were utilized. The quality of the data was deemed accurate and represents the integrity of official crime and operational statistics of the participating agencies. Ongoing efforts to reach out to these other agencies to help paint a more robust picture of crime and calls-for-service (CFS) in the region will occur for subsequent reports. The effects on the overall report are minimal since these three agencies have the lowest crime rates in the 12-agency region, and previous reports had shown few trends in crimes or other public safety issues that could be attributed to MGM Springfield.

An Open Database Connectivity (ODBC) connection to each of these agencies' records management and computer-aided dispatch databases was established, connected to the databases via Microsoft Access, and using a series of "make table" queries the data were copied into Access data tables. Records were copied to an Access database, password-protected in the process, but the originals were left on the agencies' networks so they could be updated by designated agency members when necessary. No personal identifying information (PII) was collected about any person (offender or victim), and all requests to comply with various agency requests to exclude particular data elements of concern were honored. These requests did not affect the integrity and completeness of the overall dataset.

After extracting the data from each individual system, each table was combined into a series of "master" tables. This required translating each dataset into a common set of codes. The uniformity imposed by the National Incident-Based Reporting System (NIBRS), and the fact that all the agencies use the same records management and computer-aided dispatch systems, made the translation fairly easy for crime tables; it was a bit more difficult for computer-aided dispatch (CAD) tables, which have no uniform coding even among agencies using the same system. These master tables formed the data pool for most of the statistics in this report, except where indicated.

Thirty-three FBI crime offenses (Table 2) were included in this analysis based on Group A-Incident Based Reporting definitions. They were used because they represent person and property crimes commonly experienced by victims and consistently captured by the Federal Bureau of Investigations for their annual Crime in the United States Report since 1922. The offenses incorporated into this study and placed into six (6) distinct categories are listed below. These offenses were aggregated and tracked for patterns over the study period.

Table 2: FBI Group A Incident Based Crime Reporting Categories

VIOLENCE	VICE	FRAUD	VEHICLE CRIME	BURGLARY	LARCENY THEFT
Aggravated Assault	Drug Equipment	Credit Card Fraud	Theft from Vehicle	Burglary	Theft from Building
Kidnapping	Drugs	Forgery	Theft of MV Parts		Extortion
Murder	Drunk Driving	Fraud	Auto Theft		Purse-Snatching
Robbery	Drunkenness	Identity Theft			Shoplifting
Sexual Assault	Gambling	Bad Checks			Theft from Machine
Simple Assault	Liquor Laws				Theft from Persons
Threats	Pornography				Other Theft
	Prostitution				Employee Theft
	Weapons				

Disorder offenses and 'All Other' offenses were excluded from this analysis given variances in reporting across agencies and time periods. Different reporting standards and various classification across agencies simply do not lend themselves to construct validity of these crime categories. The classifications of crime in Table 2 have a long history with FBI standards and newly defined crime categories standardized in federal IBR reporting and lend themselves to comparative analysis.

Crime and Calls For Service records were collected, and dates of reported activity noted. Tableau visualization software was utilized to discern the six study periods (Pre-Open / Open / Closed / Restricted / Reopen / full decade) for which these activities occurred. Weekly averages were calculated and graphed to illustrate the fluctuation of activity over the entire period and within each study period. The findings from this effort are reported in the pages that follow.

- For each agency and the region, historical averages and spatial and temporal patterns for key crime categories were established. They will be used as benchmarks for future analysis.

- Any significant increases were analyzed in more detail with available quantitative data.

Analytical Techniques - Identification of Hexagon Hotspots

Crime incidents for the entire decade from 2013 to 2022 were used for this analysis, with particular attention given to the most recent year, 2022.   Crime data was geo-referenced to specific addresses throughout the region and a process called geocoding was used to place them on a map using a geographic information system (i.e., ESRI's ArcGIS Pro). Figure 1 - Agencies participating in the study area displays the entire MGM Springfield Casino Region. This technique uses hexagons[19] of the same size to normalize and compare across spatial distributions and respective hotspots.

Previous established methods using cells or density maps limit their comparative validity. Hexagons more closely resemble circles (with equal distance from a center point) and

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[19] https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-statistics/h-whyhexagons.htm

provide full coverage of the area under investigation. Hexagons offer the best coverage for hotspot analysis to date, recognized by geo-spatial professional and crime analysts.

The initial study area was limited to those agencies that signed a "surrounding community" agreement with the Massachusetts Gaming Commission: Springfield, Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Northampton, West Springfield, and the Massachusetts State Police as well as Hampden, Ludlow, and Wilbraham Police Departments who did not provide data for this report. Together, these cities represent a Metropolitan Statistical Area (MSA) consisting of three counties in Western Massachusetts. As of April 1, 2020, the metropolitan area's population was estimated at 699,162, making it the 84th largest metropolitan area in the United States. Nine agencies agreed to submit data for analysis for this report, Springfield, Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Northampton, West Springfield, and the Massachusetts State Police. The remaining agencies in the region will continue to be contacted to add their data and include their jurisdictions in future reports.

- The analysis focused on the larger pattern of crime in the past decade and the seasonal patterns that it represents. Like the previous report, researchers looked at hexagon hotspots to determine the geo-spatial patterns of crime distribution and used robust graduated symbol maps to evaluate the distinct pattern of concentric zones and distance decay from the casino location and central city - Springfield[20].
- This research conducted a spatial analysis of crime counts across the study area using hexagon polygons[21] of equal size – approximately one-quarter-mile square areas. It will use these sectors to compare high crime areas and describe the scope and nature of crime in them as compared to the hexagon encompassing the casino and those hexagons immediately contiguous to it. It will compare several crime hotspots identified in the region. They will be used as benchmarks for future analysis.
- Ten distinct hotspots in the region were identified and compared to the MGM hexagon, see page 43-60 for a detailed discussion.
- Any significant increases were analyzed in more detail with available quantitative data.
- A statistical review of the expected downward trend was conducted to determine if specific crime categories were impacted beyond their expected trajectory.
- Additional micro-analysis was performed to fully ascertain crime and place. Pages 61-80 goes into great details of the micro analysis of crime in the Region.
- This report also provides a report on drunk driving as reported by the Massachusetts State Police as a follow-up report to previous research done on impaired driving.
- An on-site assessment was conducted to view the area and police personnel were contracted to gain insights into the contributing factors of these hotspots.

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[20] Concentric zones and distance decay are discussed further down in this report, page 18 and 21, respectively.
[21] Documentation for why hexagons are considered best practice in spatial analysis can be found here: https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-statistics/h-whyhexagons.htm

Involved Agencies

**Figure 1: Agencies participating in the study area**
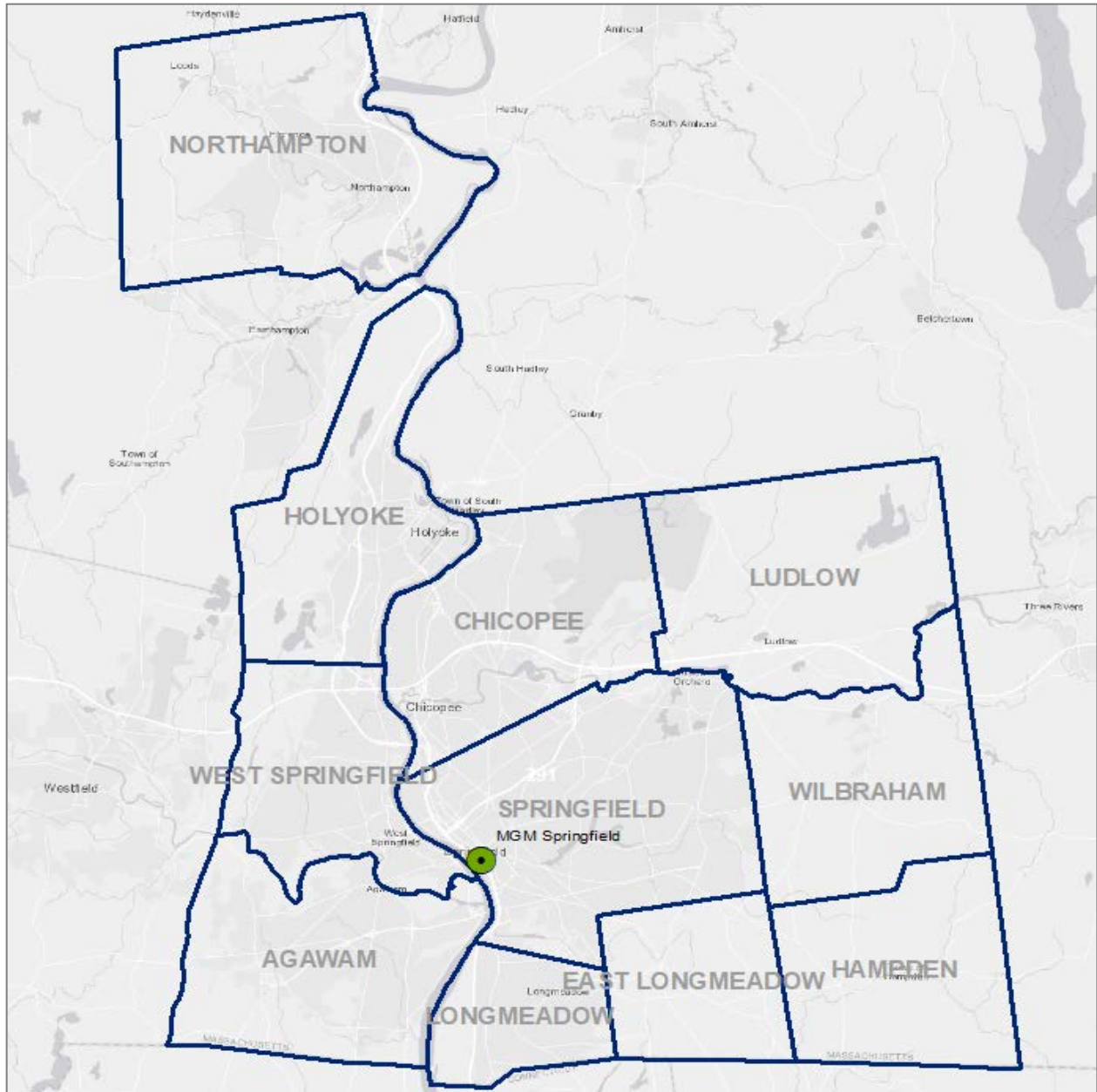
Figure 2 - The communities contributing to this analysis shows the area used for this report's analysis and the hexagons that represent the areas on which we aggregated the data.

Figure 2: The communities contributing to this analysis.
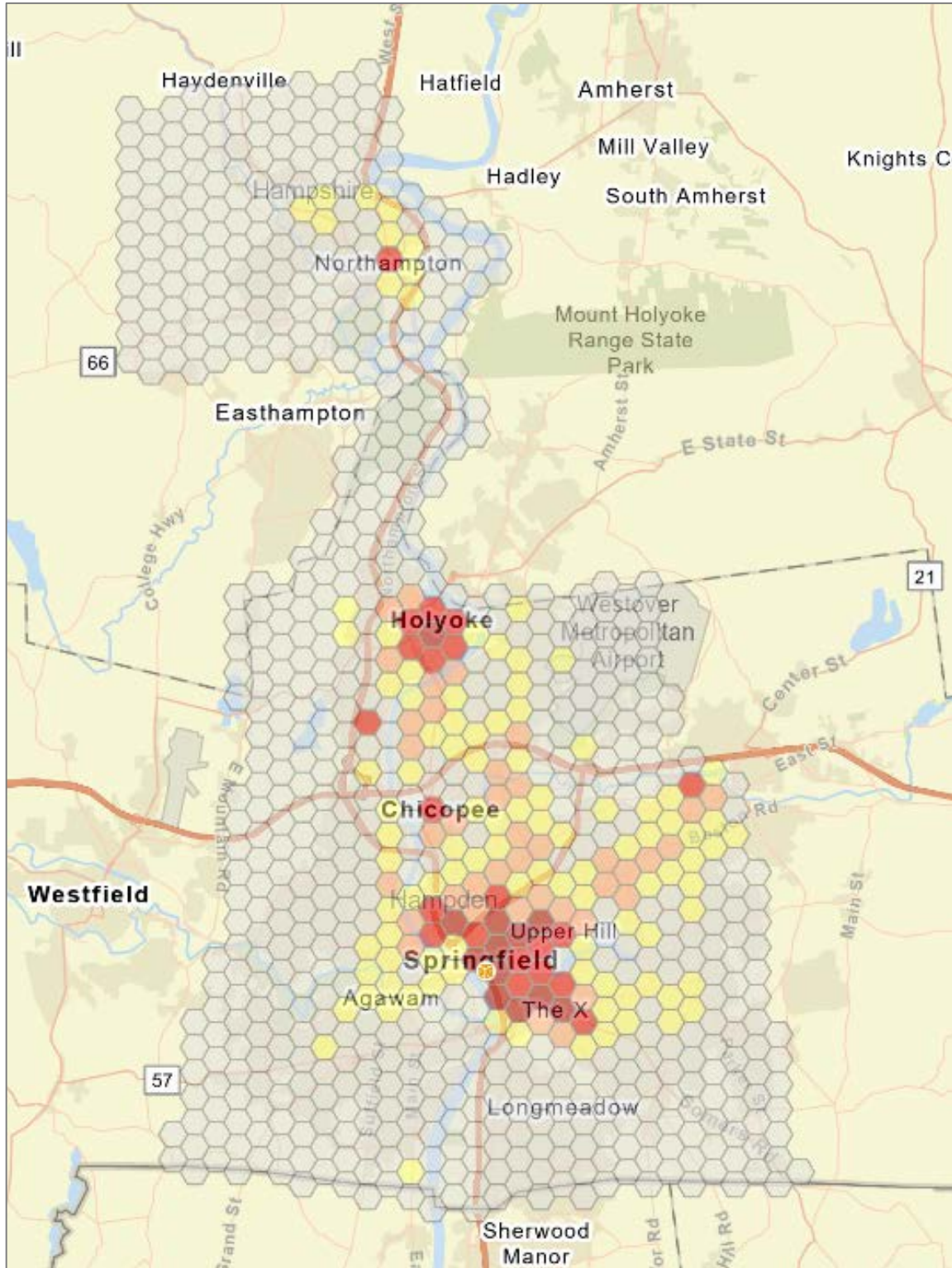
Crime Definitions

The following are definitions of the crime categories used in this report. These are mostly drawn without modification from the FBI's definitions for NIBRS (National Incident Based Reporting System) crime categories. In almost all cases, *attempts* to commit these crimes are counted equally with completed offenses. These crimes must, of course, be reported to the police to be included in this report. Offense types by associated crime category can be found in Appendix C.

Some crime types are grouped together based on common behaviors or themes. The FBI uses group categories for **Violent or Persons Crime** to include Murder, Rape, Robbery, and Aggravated Assault; and for **Property Crime** to include Burglary, Larceny and Motor Vehicle Theft (also called Stolen Vehicles). Others have combined crime groups to include **Vehicle Crimes** to include Motor Vehicle Theft, Larceny From Vehicles and Larceny of Auto Parts, Criminal Damage to Vehicles, and Tampering. **Vice Crimes** are grouped by specific crimes related to drugs, alcohol, gambling, pornography, and prostitution. These groupings will be utilized as part of this analysis and as categories throughout the report when appropriate.

Aggravated Assault: An attack by one person upon another for the purpose of inflicting severe bodily injury. Aggravated assault is either accompanied by the use of a deadly weapon (e.g., gun, knife, club) or some mechanism that would result in serious harm (e.g., pushing someone down a staircase), or by serious injury even with a weapon that isn't normally "deadly" (e.g., punching someone and breaking his jaw). If the incident involved neither a deadly weapon nor serious injury, it's coded as a simple assault instead.

Arson: Intentional burning of a structure, vehicle, or personal property.

Auto theft: Thefts of vehicles capable of operating under their own power, including automobiles, trucks, buses, motorcycles, and snowmobiles.

Bad checks: The issuance of checks on accounts with insufficient funds. This type of crime is typically only reported by police when an arrest is made, or an individual is charged.

Burglary: Unlawful entry of a structure, including residences, commercial buildings, and government buildings. The entry does not have to occur by force (e.g., a "break-in"). The usual motive for burglary is to steal something inside, but this isn't a necessary part of the definition.

Counterfeiting/forgery: Use or possession of an altered, copied, or imitated negotiable or non-negotiable instrument, including U.S. currency, checks, and money orders.

Credit card fraud: Use of a stolen credit card or credit card data to obtain goods or services.

Disorderly: Disorderly conduct that rises to the level of a criminal charge.

Drug offenses: Manufacturing, sale, trafficking, transporting, or possession of controlled substances. Typically, "incidents" of such crime are arrests, as the only way such incidents are reported is when they are discovered by the police.

Drunk driving: Operation of a motor vehicle while intoxicated; usually while above a state-designated legal blood alcohol level. As with many of the drug and alcohol categories, such incidents are only reported when discovered by the police, usually resulting in an arrest.

Drunkenness: Naturally, not all incidents of intoxication are a police matter. Police incidents that fall into this category are usually incidents of either public intoxication or individuals so dangerously intoxicated that they are placed into protective custody until sober.

Employee theft: Also, "embezzlement." Theft of an employer's property by an employee.

Extortion: Theft or attempted theft of money, goods, or services through non-violent coercion.

Family offenses: Unlawful, nonviolent acts by a family member that threaten the physical, mental, or economic well-being of another family member and are not classified under any other category. This category is only reported when someone is charged, and it almost always involves violations of restraining orders or child neglect.

Forgery: Forgery of personal checks, business checks, U.S. currency, or similar negotiable and nonnegotiable documents.

Fraud. Theft of property by lying in such a way that convinces a victim to surrender money or goods. It is theft through some kind of scheme, "con game," or ruse.

Gambling offenses: Crimes related to illegal gambling, promoting gambling, operating gambling machines, bookmaking, and sports tampering.

Identity theft: Representation of oneself as another (actual) person or use of another person's identifying information to obtain goods or services, housing, medical care, or status.

Kidnapping: The abduction of one person by another, whether through force or guile. Most incidents coded as such are "custodial" kidnappings involving a parent taking a child in violation of a custodial agreement.

Liquor law violations: Illegal manufacturing, sale, possession, or consumption of intoxicating drinks, often because the offender is below the legal age.

Murder: the killing of one person by another, including non-negligent homicides.

Other thefts: A general category that includes thefts of services (e.g., gas drive-offs), thefts from persons (e.g., pocket-picking), thefts from outdoor public areas. Essentially, any non-burglary, non-robbery theft that is not covered in one of the "theft" or "shoplifting" categories (below) is categorized here.

Pornography: Possession, sale, or manufacturing of illegal pornography. Since pornography is legal in Massachusetts, such incidents generally involve minors, either as the subjects or recipients of the pornography.

Property crime: An aggregate category that sums the totals of arson, burglary, thefts from persons, purse snatching, shoplifting, thefts from buildings, thefts from machines, thefts from vehicles, thefts of vehicle parts, other theft, auto theft, forgery, fraud, credit card fraud, identity theft, employee theft, extortion, stolen property, and vandalism.

Prostitution: Promotion or participation of sexual activities for profit. As with drug offenses, most "incidents" of prostitution are arrests, as the crime is rarely reported except when discovered by the police.

Purse snatching: A theft in which an offender grabs a purse off the arm of the victim. If any significant force, violence, or threats are employed, this crime becomes a robbery.

Robbery: Taking or attempting to take anything of value from another person by force or violence or threat of force or violence. "Muggings" and "hold-ups" are examples of robberies. A robbery requires a direct confrontation between the offender and victim; houses and buildings cannot be "robbed."

Sexual assault: Any sexual act directed against another person (of either sex), either by force or otherwise against the person's will, or non-forcibly but when the victim is incapable of giving consent because of temporary or permanent mental or physical incapacity. This category combines rapes, indecent assaults, molestation, and sexual penetration with an object.

Shoplifting: Thefts of items offered for sale at retail establishments.

Simple assault: An assault that does not involve a dangerous weapon and does not result in significant injury.

Statutory rape: Nonforcible sexual activity with an individual who is unable to give legal consent because of age.

Stolen property offenses: Possession or sale of property previously stolen including motor vehicles and personal property. Often, the person possessing the property is the one who stole it in the first place, but this category is used when the actual thief cannot be determined.

Thefts from buildings: Thefts of items from commercial or government buildings open to the public, where such entry does not constitute burglary. This often takes the form of thefts of employees' property at businesses open to the public.

Thefts from machines: Thefts from coin-operated machines, either for the coins or for the products inside.

Thefts from persons: Thefts of personal property from the direct control of the owner. These often take the form of pocket-pickings or thefts of or from diners' purses at restaurants. If any force, violence, or threats are employed, this crime becomes a robbery.

Thefts from vehicles: Thefts of items from motor vehicles. The category includes breaking into vehicles (e.g., smashing a window), unlocked entry, and thefts of items from a vehicle's exterior, such as pickup truck beds. Note that thefts of vehicle parts are in a separate category.

Thefts of vehicle parts: Theft of parts or accessories from motor vehicles, including wheels, license plates, and engine parts.

Threats: Threats to commit physical violence by one person against another. If any weapon is displayed or employed, or if an assault is attempted, the crime is categorized as a simple or aggravated assault instead.

Trespassing: Illegal entry to a non-public part of a residence or business. Such entry is rarely to the *interior* of the property, or it would be coded as burglary instead. Most reportable incidents of trespassing are either after notice (e.g., a repeat shoplifter who is ordered not to return to a store) or at posted locations (e.g., construction sites, abandoned buildings).

Vandalism: Destruction or defacement of public property, buildings, vehicles, or personal property.

Violent crime: An aggregate category that sums totals for murder, sexual assault, kidnapping, robbery, aggravated assault, simple assault, and threats.

Weapon offenses: Possession, sale, or manufacturing of illegal weapons. This is often an additional offense discovered by police during arrests for other crimes.

Micro-analysis using Hexagons – Hotspot Analysis of Crime

The map shown on Figure 2 (above) illustrates the hotspots for all selected crime and depicts significant amount of crime in twelve (12) distinct hexagons. These patterns of hexagons did not lend themselves to a clustering of hexagons used during the Encore Boston Harbor study. They do naturally cluster along transportation roadways. The Holyoke hexagons mirror the clustering seen in the Encore area but since the MGM region does not lend itself to this approach, the researchers compared hexagon by hexagon and looked to distance decay and social disorganization theory to explain the spatial pattern seen in the MGM area. At this stage of analysis, counts per polygon were used to provide areas that had significantly higher crime counts than its neighboring areas, and were chosen using a common-sense approach. The top ten hexagons in the Springfield CBD were compared to the hexagon hotspot in Holyoke and one in Northampton.

Threats to validity

All the agencies in the MGM Springfield region code crimes, according to the NIBRS standard, but can still create slight variances in their approaches and can make interpreting the data inconsistent between agencies at times. It is beneficial to data integrity that all eight agencies use the same records management vendor. Springfield PD is in the process of selecting a new RMS vendor and the researchers will have to adjust to incorporate their data in the future.

The primary threat to the validity of the statistics in this report is the data structure of the IMC records management system, which makes it difficult to calculate precise crime statistics. All the participating agencies use this system[22].

Almost every other commercial records management system on the market stores crime incidents and their associated offenses in a master table. All crimes, whether they result in an arrest, go into the same table. If an arrest accompanies the incident, immediately or sometime after, additional data elements specific to the arrest are entered in supplemental arrest tables that link to the master tables. Crime statistics are calculated from the master tables. The IMC system, in contrast, stores criminal incidents in two separate tables: arrests and non-arrests. (There is technically a third table, storing warrants, but agencies that use this table seem to duplicate those crimes in the incidents table.) Some incidents appear in only one table; an arrest made at the time that an incident is reported, for instance, goes in the arrest table.

This immediately creates a problem when multiple individuals are arrested for the same incident. Two offenders arrested for a single robbery "incident" should count as a single robbery, but there is no unique index that ties two arrest records to the same crime. We must rely on the arresting officer filling in a related case number field that does not always get filled in.

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[22] The original system was from a locally owned company called IMC. This company was bought by Zuercher Technologies, which was bought by TriTech Software Systems, which merged with several other companies to form CentralSquare Technologies. The current name of the RMS seems to be "Records Pro," but locally it is still universally known as "IMC."

Accurate statistics cannot be calculated by simply adding the two tables, as it is possible for a single incident to appear in *both* tables. For instance, an incident may be reported on Monday. Lacking any evidence to make an arrest or issue a warrant, the reporting officer enters data into the incident table. On Tuesday, evidence points to a particular offender, he is arrested, and the officer enters the data into the arrest table.

To account for such situations, the records system contains a field in the arrest table for the original incident number. Both the arrest and incident tables also contain the original call number, which should help deconflict duplications. However, in practice, few agencies use these fields with any fidelity. Moreover, different crime types can appear associated with the same incident in each of the two tables.

Finally, the TriTech/IMC system does not appear to enforce National Incident-Based Reporting System (NIBRS) standards when it comes to the recording of secondary offenses. NIBRS recognizes "lesser included offenses." For instance, it is assumed that every robbery is accompanied by an assault and a theft, and that almost every burglary is accompanied by a theft and a vandalism. Thus, no single crime should report both a burglary and a theft nor a robbery and an assault. Such extraneous offenses co-exist frequently in the IMC system. Indeed, by failing to distinguish between *arrest charges* and *incident offense codes*, the system creates a situation in which multiple extraneous charges often accompany an arrest.

To account for these problems, the statistics in this report adopt the following conventions:

1. Arrests and non-arrests are combined into a single record when the proper cross-indexing values were entered by the reporting officer in the system.
2. Even in absence of the index value entries, arrests and non-arrests are assumed to be part of the same incident if the reporting date/time and address are the same.
3. Multiple arrests are combined into the same "incident" if they happened at the same location and time.

The IMC system also makes a mistake—although this one is replicated among many RMS vendors—of trying to resolve Massachusetts General Law codes directly to NIBRS incident type codes. This allows officers to enter the statute violated by the offender (a code list with which they are familiar because of training and practice) and have the system itself convert it to the appropriate NIBRS code. Although this seems a valuable shortcut, in truth there is a poor relation between statutes and NIBRS codes, and such a system ensures that many crime types—principally in the theft and fraud categories—will be under-reported and a few crime types will be consistently over-reported.

Finally, there are a number of issues with agency coding practice that affect the validity of the baseline statistics and the consistency of data going forward. Common issues include:

- Overreliance on the "All Other" (90Z) IBR code instead of a more specific crime code that applies to the circumstance.

- Overuse of the "Other Theft" (23H) IBR code instead of a more specific theft type—for instance, shoplifting (23C), theft from a vehicle (23F), or theft from a building (23D).

- Rare use of the "Alcohol Involved" flag in the crash reporting module, making the data field essentially useless.

- Overuse of the "Other/Unknown" location type and property type categories.

- Under-use of the "Family Offenses" (90F) code to record restraining order violations and child neglect cases.

- Rampant confusion among the codes for fraud (26A), credit card fraud (26B), impersonation (26C), identity fraud (26G), forgery and counterfeiting (250), and bad checks (90A).

Due to the researchers' concerns regarding these inconsistencies, this analysis did not attempt to use these crime categories or coded variables. JRA is confident of the other crime classifications due to the history and longevity of their use for FBI reporting and federal oversight and quality control.

Discussions with agency representatives - Agency Collaboration

Throughout the life of this series of reports, the Massachusetts Gaming Commission has regularly convened meetings with the police executives in the state to review the results of these analyses and receive their comments and feedback, prior to publication of the reports. Their feedback is incorporated into each report. General agreement with these findings has been widespread, and where there has been disagreement an alternative perspective has been provided, and it has been noted in this report.

Key Limitations[23]

First, our focus was on overall crime trends and as such did not examine other factors that could be influencing crime throughout the region. Second, our study period includes the time of George Floyd's death (May 25, 2020) and the subsequent racial and social justice protests that occurred throughout the United States. Although some reports indicated some instances of looting and aggravated assaults, our data do not permit us to consider this further. Finally, while we think that examining policy changes is important, the short period between the key-dates in this study necessitated a short-term evaluation approach of the effect of COVID-19 related regulations.

Future research should continue to monitor the re-opening over a longer period of time and consider historical crime patterns to better understand the effect of COVID-19 regulations on crime and continue to monitor such trends as well as crimes that are ancillary to COVID-19

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[23] These limitations are attributed to Riddell et al. (2022), and fully embraced as relevant for our ongoing research as well.

related to masking even amid no apparent restrictions. It is possible that officials were unprepared for the toll such shelter in place orders would take or that would-be offenders saw new or different opportunities to commit crime. It was anticipated that re-opening efforts, especially from a routine activity perspective, would lead to increases in the number of people leaving their homes and entering public spaces, creating potential opportunities for increases in crime. However, it may be the case that people remained somewhat sheltered because schools remained closed, businesses continued to encourage work from home policies, and people were still afraid of contracting the virus. Therefore, simply re-opening places did not mean that people would resume their pre-pandemic routines.

Once again, we want to emphasize that the Springfield MGM Casino is located in the heart of Central City or the central business district (CBD). Placing the casino within the CBD was intentional for economic development reasons and offered increased activity, surveillance, and social organization to an area already prone to high crime rates and this intentional design appears to have positively impacted crime (i.e., reduced it) in the area surrounding the casino. The subsequent analysis and findings speak directly to crime in the region and the effects of crime as one goes farther from the CBD - a key element of social disorganization theory.

It is important to keep in mind that data collected only include crimes reported to the Springfield Police Department, which generally do not include incidents inside the casino. These are reported to the Massachusetts State Police Gaming Enforcement Unit and are not part of our data collection. These figures thus represent the surrounding streets, businesses, and local community. Ongoing efforts to get the crime and calls for service data that occurs on the MGM property are underway and the Massachusetts Gaming Commission supports JRA's efforts to do so.

Findings

Crime continued to drop along the predicted trend lines in the majority of the region. The line graph[24] below (Figure 3) shows that overall crime in the region has declined year over year for a decade but had a slight upturn in 2022. Overall, 40,000 general crimes occurred in 2013 and the number has steadily dropped to below 27,000 incidents from 2013 until 2021. This represents an average 5% decrease in crime each year over the past decade. While the number of crimes reached its lowest mark in 2021 with 26,640 crimes in the region, a slight increase did occur in 2022 at 27,521 incidents - still the second lowest number in the past ten years. There were on average between 1,100 to 1,800 fewer crimes each year during this timeframe. Crime dropped by 1,500 crimes the year after the casino opened. While COVID-19 may have contributed to this decline in 2020 and 2021, the number of crimes in the region rebounded 1,100 incidents in 2021. If the casino caused crime to increase since it opened in 2018 other socio-economic factors must have offset the consistent drop in the crime rate.

Figure 3: Total Crime in Full Region
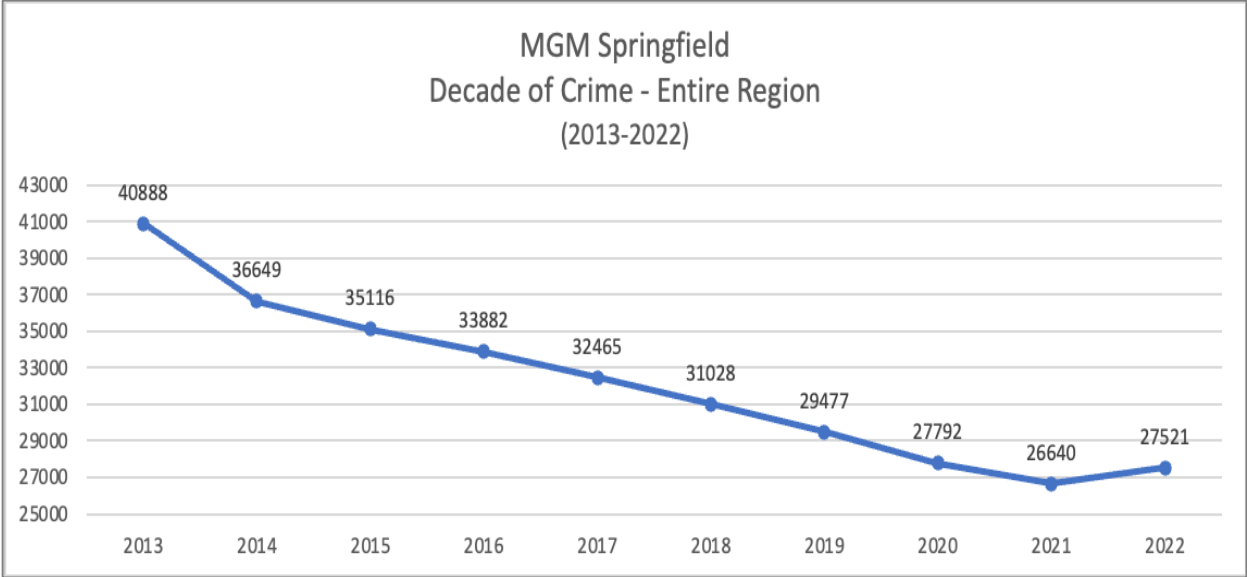
Violent crime and property crime counts (See Figure 4) followed a similar downward trend over the years in the region. Property crime has continued to fall consistently by between 1,000 and 1,500 incidents each year until COVID-19. In 2021, property crime fell to its lowest number at 8,379, only to turn upward by a small margin to pre-COVID numbers (8,975 in 2022) still the low watermark outside the pandemic in the past decade. In 2022, property crime rose by over 600 incidents. Violent crime appears to have stabilized between 2,400 and 2,500 offenses in the past four years, reaching a ten-year low of 2,430 in 2022. While violent crime remains flat since the MGM Casino opened in 2018, the introduction of gambling does not appear to have caused an increase in violence with the exception of a slight increase in 2018, the year the casino

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[24] This annual data is calculated on a calendar year basis now that the MGM has been open for several years, and we have a good history of reporting. MGM reports will continue to use calendar timelines for comparison purposes.

opened in late August, only to be followed by a downward trend the following three years. Violent crime remained steady over the past decade only dropping around 600 incidents from the high watermark in 2013 (N=3,022) to just above 2,400 in 2022 (N=2,430) for the entire Region. Springfield experienced the lion's share of the crime in the Region, as will be discussed in the City-by-City section.

Figure 4: Violent and Property Crime in Full Region
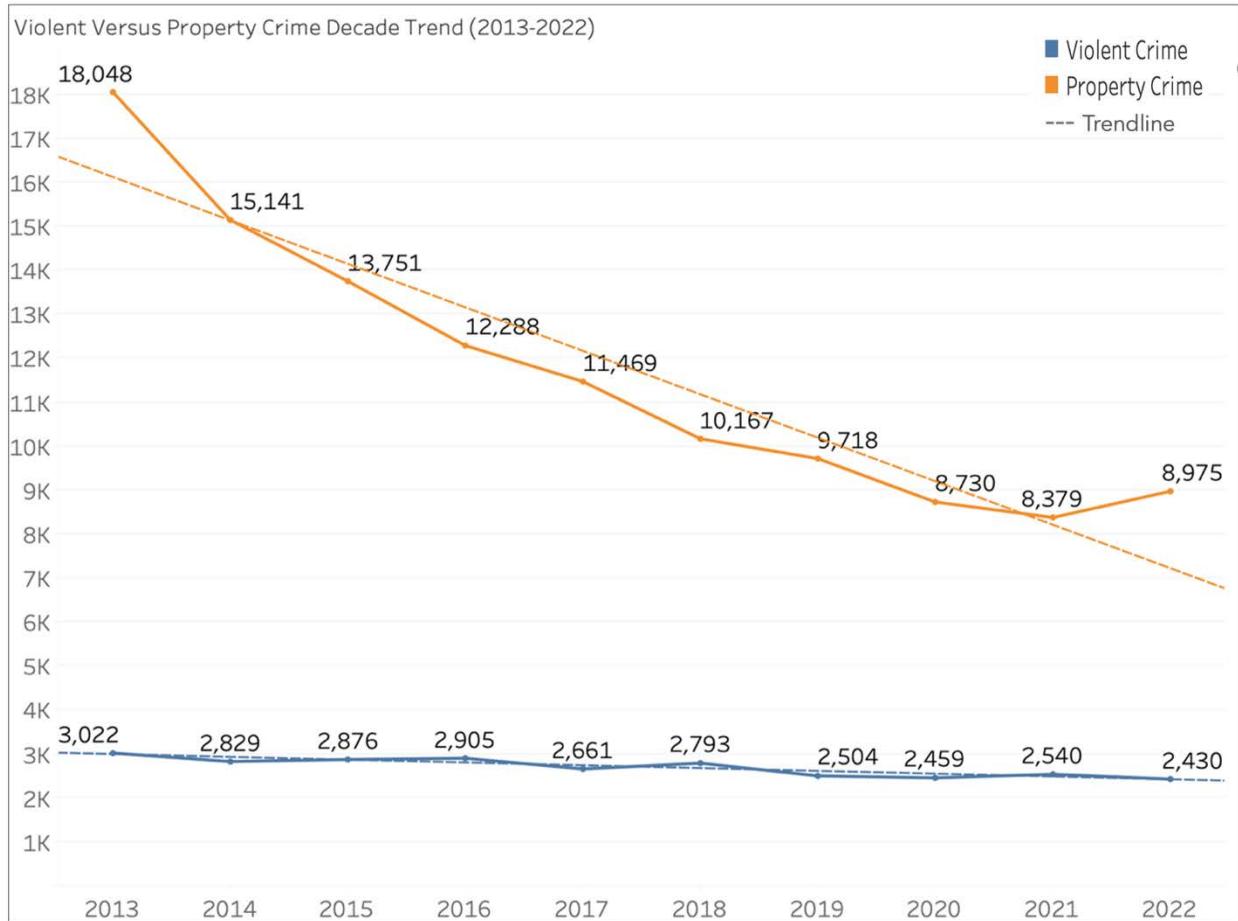
The remainder of this report will review crime at the regional level, provide a City-by-City breakdown and comparison, and conclude with a micro-analysis.

City by City Crime Trends

Figure 5, on the next page, shows the consistent downward trend in all but two of the cities in the Region (i.e., Springfield and Agawam). Springfield had a reduction of over 8,000 crimes per year since the beginning of the decade (from 22,368 in 2013 to 14,199 in 2022). Springfield did not experience a significant drop in crime during COVID-19, but rather followed the expected trend line the decade pattern clearly represents. Springfield saw a slight uptick in 2022 for all crime but still nearly 800 crimes lower than 2019 the year before the pandemic.

Holyoke, Chicopee, West Springfield, Northampton, and East Longmeadow followed the same pattern over the past ten years with a slight increase in crime in 2022 (with the exception being Holyoke having back-to-back slight increases in 2021 and 2022) preceded by being the only city with a sizable decrease in crime during COVID-19. Longmeadow has generally remained flat and steady at just under 400 crimes each year since 2013 with an abnormal spike in 2020 with over 500 crimes in this single year. Agawam was the only city in the region to experience an upward trend over the past decade, ranging from 765 incidents in 2013 and with over 1,300 crimes 7 of the past 8 years, peaked at 1,389 in 2017 and totaling 1,275 in 2022. Most of the cities in the MGM Region are relatively small in size with the exception of Springfield and enjoyed lower crime rates that reflect small towns in the United States in general.

Figure 5: Crime Trend Across all Cities in the Region

Springfield: data points 22368 (2013), 19592 (2014), 18572 (2015), 17484 (2016), 16112 (2017), 15801 (2018), 15050 (2019), 14571 (2020), 14052 (2021), 14199 (2022); trendline $y = -847.99x + 21444$

Holyoke: $y = -330.09x + 6911.6$

Chicopee: $y = -75.042x + 4270.7$

West Springfield: $y = -80.024x + 2779.7$

Northampton: $y = -134.95x + 2572.5$

East Longmeadow: $y = -31.497x + 806.73$

Longmeadow: $y = -0.3758x + 392.87$

Agawam: $y = 35.503x + 1022.1$
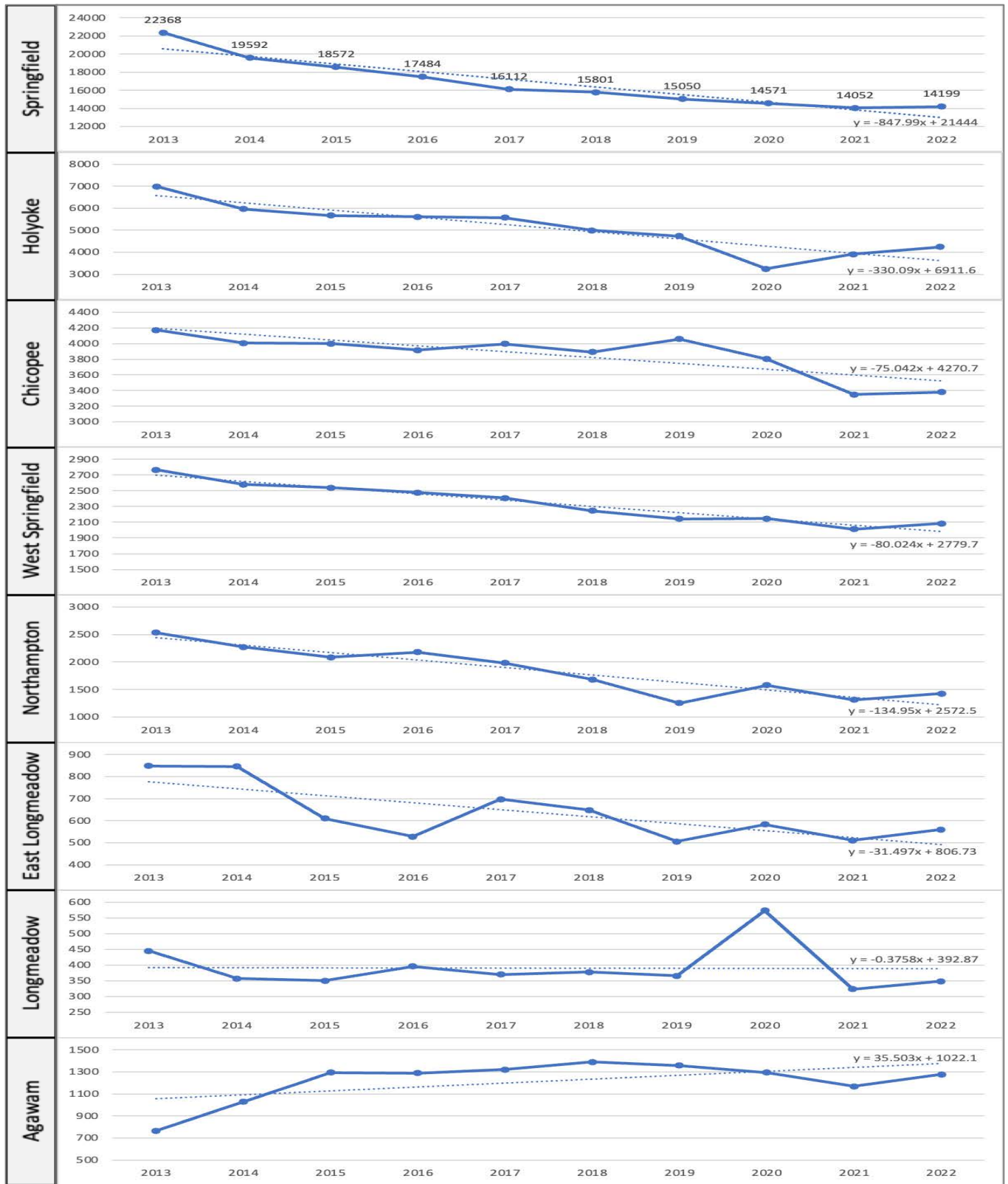
Distinct Seasonal Rhythmic Pattern

Figure 6 on the following page represents the starkest seasonal pattern the researchers have seen. The rhythmic summer seasonality pattern depicted here consistently shows crime rising in the late spring and summer months (9 of 10 months outside of the COVID-19 summer - which created a lag in the seasonal trend).

Crime spikes in the MGM Region occurred five times in July, twice in May and once in June and August to round out the pattern. The average number of crimes at the peak of each year was 1,293. In contrast, the winter seasonality pattern shows nine out of ten low watermarks in December, January, and February, where the region experienced on average 840 crime each week in the winter months. These spikes and low points represented a swing of over 450 crimes from one season to the other. During COVID-19 this seasonal pattern peaked at only 1,181 during the week of October 18, 2020 and bottomed out twice at 741 during the week of April 12, 2020 and again during the week of December 20, 2020. These statistics clearly demonstrated that crime went down during COVID-19 and reflected the lower social interactions between people during closures and restricted openings.

At the start of the decade (2013) the high watermark was 1,422 the week of July 14, 2013 and has dropped significantly to a 2020 high watermark of 1,157 - the lowest summer peak on record in the past ten years. The lowest watermark experienced in 2013 resulted in 939 incidents the week of February 17, 2013 and now in 2022 dropped to 792 the week of December 11, 2022 - the second lowest mark with the exception of 773 in the winter of 2017 during the Week of December 24, 2017 (with the exclusion of the COVID -19 period). Figure 6 provides clear evidence that the MGM Springfield Region is getting safer over time.

In a closer look of the pre-, during-, and post-COVID-19 periods similarly presented in the Encore Boston Harbor Report, Figure 7 clearly shows the same overall crime pattern. Crime occurrences significantly dropped during the initial COVID-19 Closure from March 15, 2020 until July 12, 2010; but the number of crimes climbed above the expected average while the casino and other establishments were closed for business and continued to climb in the first half of the restricted re-opening only to dip to its lowest weekly numbers in December of 2020 (N=741). Of course this pattern followed the winter seasonality the region had experienced for the decade. What is more interesting is that since the full reopening after COVID-19, crime did not rise to previous levels and, in fact, remained below COVID-19 high watermarks (both summers peaking at around 1,160). Perhaps this is a post-COVID-19 effect and it will take longer for social life to get back to "normal" or expose the new normal, only time will tell.

Figure 6: Region Crime Compared over the Entire Timeframe (2013-2022)
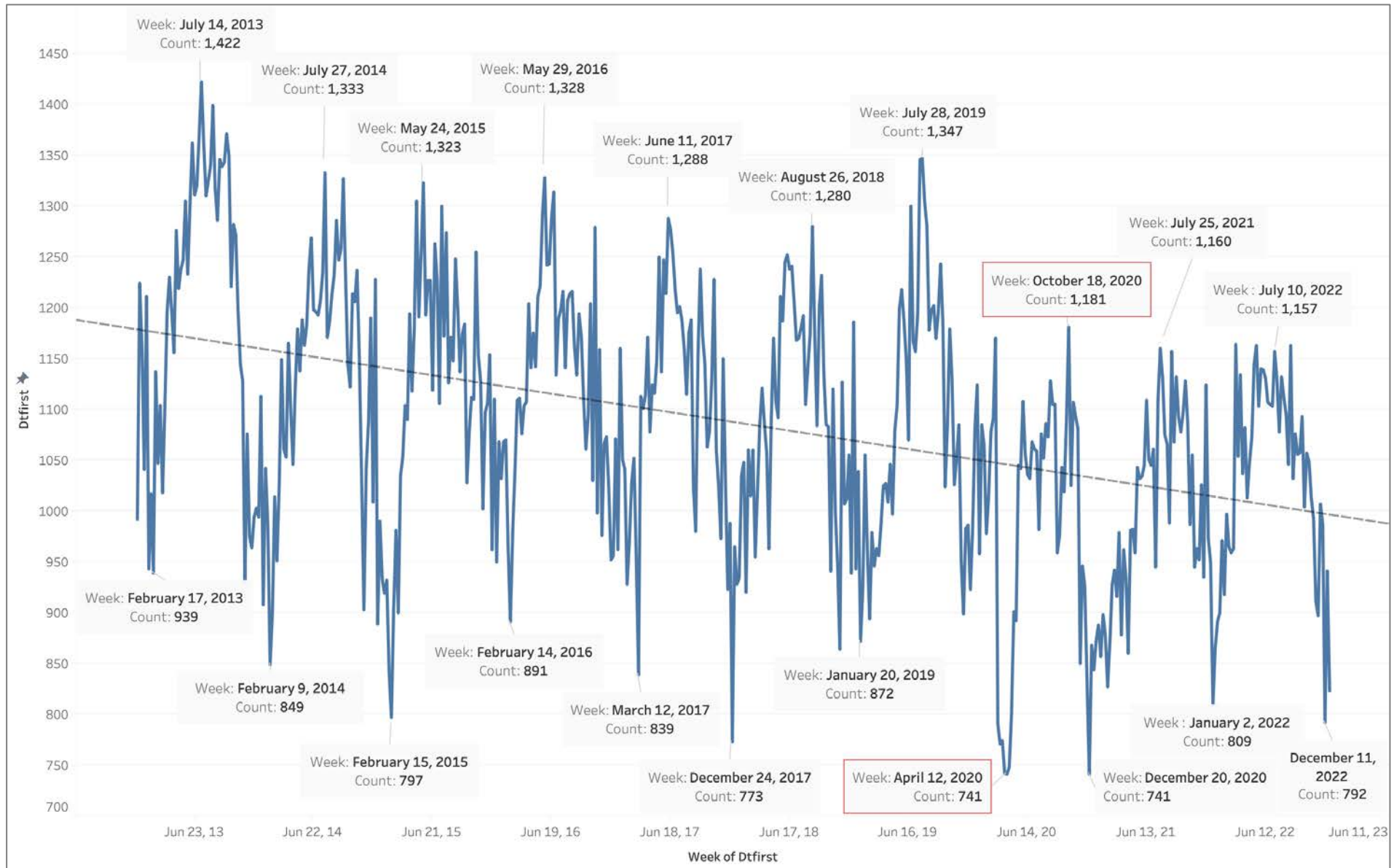
Figure 7 clearly demonstrates the seasonality of crime, most likely a statewide phenomenon, but critical information none the less. Police should anticipate this ebb and flow as they plan strategies to fight crime in summer months and focus on key hotspots for crimes of interest.

Figure 7: Region Crime Compared over the COVID-19 Timeframe (2013-2022)
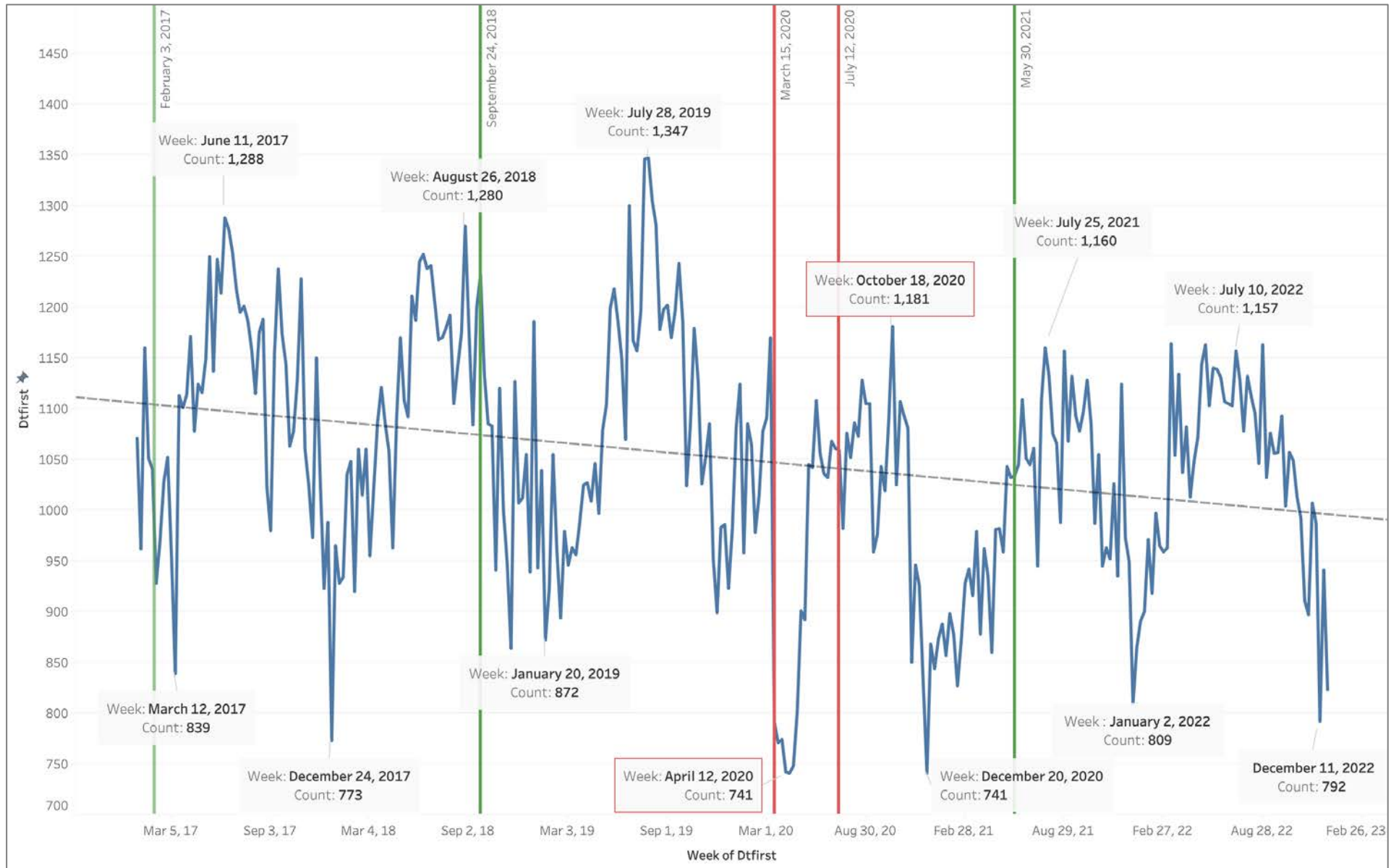
COVID-19 closures created a significant drop in crime between April 12 and October 18, 2022 only to rise during the restricted reopening initially. Significant drops in crime followed the subsequent winter and rise again once the restrictions were lifted. Crime returned to the seasonal pattern after the reopening of establishments but did not return to the same levels of crime during pre-COVID cycles.

Hexagon Hotspot Analysis

Figure 8 shows a clear distribution of crime that supports and illustrates the Social Disorganization Theory premise that crime is prevalent in the Central Business District zone or Central City and diminishes as it gets further from it. This crime distribution held true for Springfield, Holyoke and to lesser degree in Northampton.   It also provided evidence for distance decay theory that the further one gets from the source, homebase or the anchor, the less likely crime will occur. Our microanalysis takes a closer look at two other Springfield hotspots and three other Central City locations within the region to get at the factors that may have contributed to the higher frequency of crime within these hexagons. Crime became nearly non-existent when we move further away and into the residential zone. Crime in the MGM Springfield Region clearly depicts this social structure explanation and can be used to develop effective patrols and crime prevention strategies.

Figure 8: Hexagon Distribution of Region
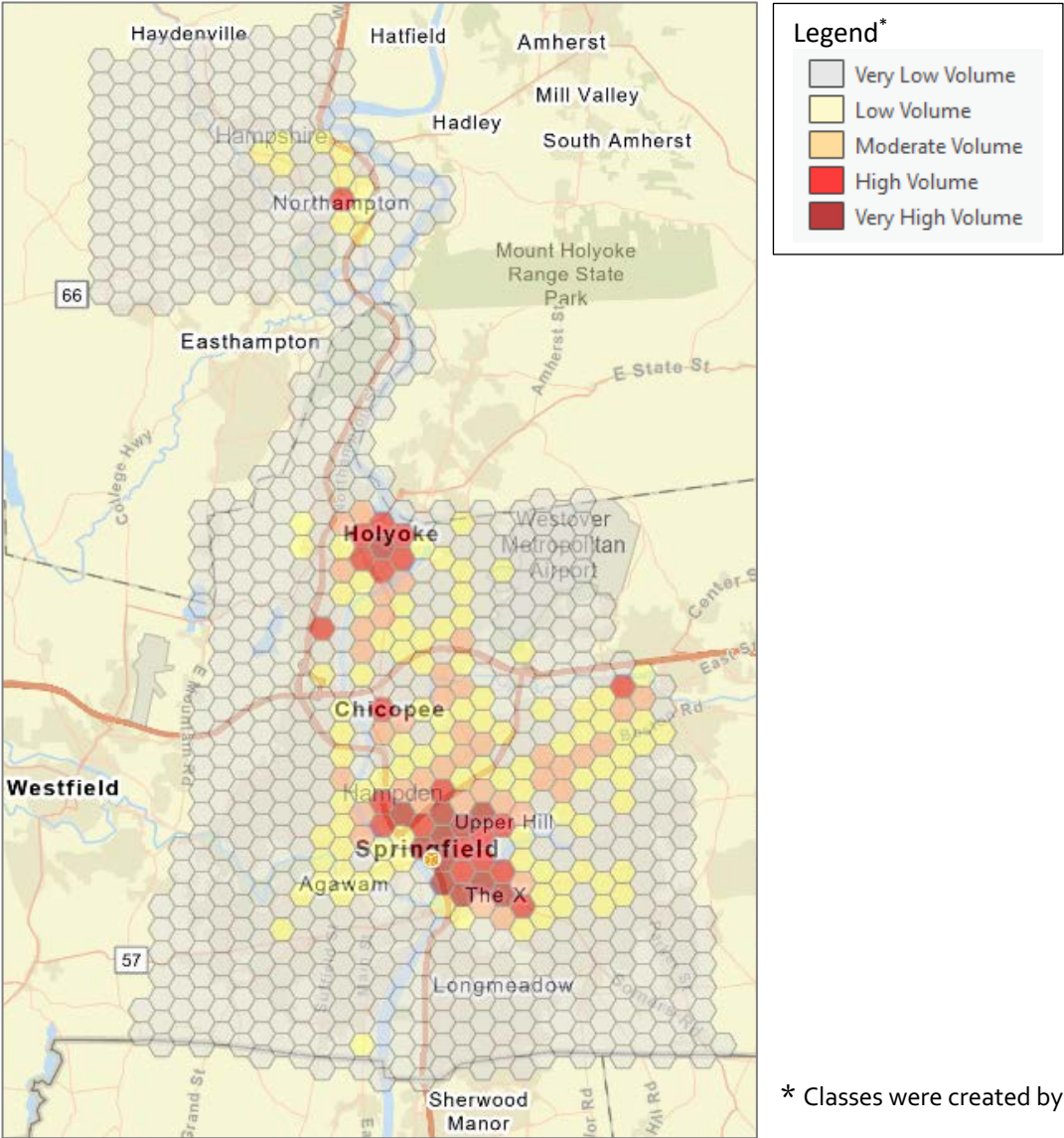
* Classes were created by Natural Breaks

The two figures (Figure 9 and 10) on the following pages showing hexagonal crime distribution and hexagonal crime counts are discussed below.

Figure 9 (page 47) illustrates that the City of Springfield is the primary source of crime in the Region and shows that crime diminishes as you get farther away from Central City. This analysis supports the central premise that the MGM Springfield Casino sits in the middle or at the point of a clear crime pattern - apparently in the shape of the letter C. MGM is at the apex of the C-shaped crime pattern that, from a crime pattern theory perspective, follows the nodes and the pathways socially constructed. The greatest amount of crime occurred on the transportation roadways following State Street to the north and east; and followed Main Street which turns into Belmont to the east. This hexagon hotspot pattern continued for four consecutive hexagons in both directions or approximately one mile from the two Central City hexagons that encompass the immediate MGM area.

The Connecticut River serves as a natural fortress for crime to the west of MGM and crime occurrences are extremely limited as a result of this environmental barrier - acting almost like a moat. The crime pattern follows the river and the main transportation thoroughfares creating a distinct correlation to primary roadways and inversely uses the river as a natural buffer.

Figure 10 (page 48) shows the hexagon counts starting with the MGM hexagon (R-37) - totaling 4,549, and 5,350 (Q-36) and 4,836 (R-36) offenses for the decade, in subsequent clockwise order from the casino. These three hexagons are the top three crime volume hotspots[25] in the entire region, respectively. They clearly represent the apex of crime distribution and the core of Central City Springfield. Hexagons along State Street produced crime counts of 3,709 (S-35) and 3,822 (T-35) respectively. The hexagons along Main Street and Belmont Street heading away from the MGM, resulted in crime counts of 3,158 (R-38), 3,457 (S-38), 4,193 (T-38) and 3,483 (U-38), in geographic order.

There is only one other hexagon (P-35) to the northwest that had more than 3,000 crimes registered in its boundary.

This approximate two square miles (or 8 quarter mile-sections) accounted for over 36,500 victims of crime in the past decade in Springfield alone. This evidence clearly shows a high spatial correlation to the MGM casino. However, it is crucial to emphasize that correlation alone does not establish causation. Therefore, it is imperative to determine whether the observed relationship is indeed attributed to the casino or if it may be a spurious correlation influenced by the casino's location. This distinction is of utmost importance for the Massachusetts Gaming Commission (MGC).

It is important to underscore that crime was present in the area prior to the opening of the casino. This represents substantial evidence and suggests that crime levels in the vicinity are not solely influenced by the casino but may have preexisting causes. It is noteworthy that high

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[25] Hotspots are labeled in Figure 10 as a LETTER-NUMBER, (e.g. R-37) for identification purposes only.

crime rates in the central business district (CBD) of Holyoke (discussed later), where there is no casino, support the notion that alternative explanations need to be considered, and the presence of a gaming venue may not be the primary factor.

This relationship could be spurious or intervening and since the casino is located in the center of an historical crime hotspot, it continues to be of concern for public safety in the area. Crime in the central business district has historically been high, albeit trending down over the past decade, and the opening of the casino did not cause an increase in crime in Central City. Other hotpot comparisons provide additional insights into the factors that contributed to crime generation, discussed further down in the report.

The other cluster of hexagons in the Holyoke Central City area experienced 4,728 offenses at its core and is surrounded by hexagons ranging from almost 2,600 to just above 1,600 criminal incidents. On a smaller scale, the Central City explanation of crime holds true for Holyoke as well. A micro-analysis of some of these specific hotspots are provided as part of the researchers' qualitative on-site assessment. Of course, Holyoke's crime hotspot cannot be explained by having a casino in the center of it, something else is at play; it most likely represents a Central Business District zone. This will be discussed in a later section of the report.

Figure 9: Springfield C-shaped and Holyoke Central City crime distribution and natural river boundary.
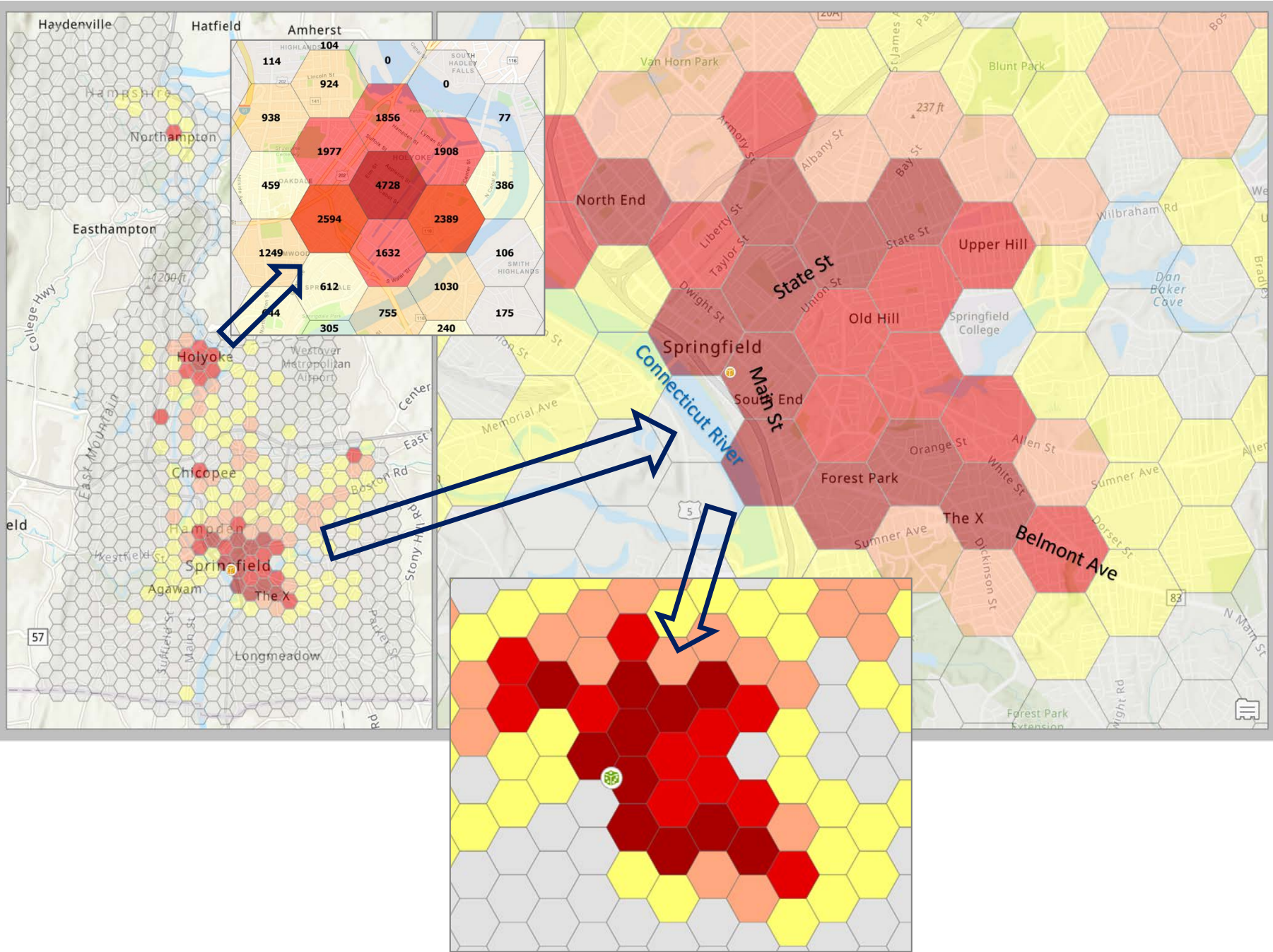
Figure 10: Hexagon Label and Crime Counts in the Central City Area
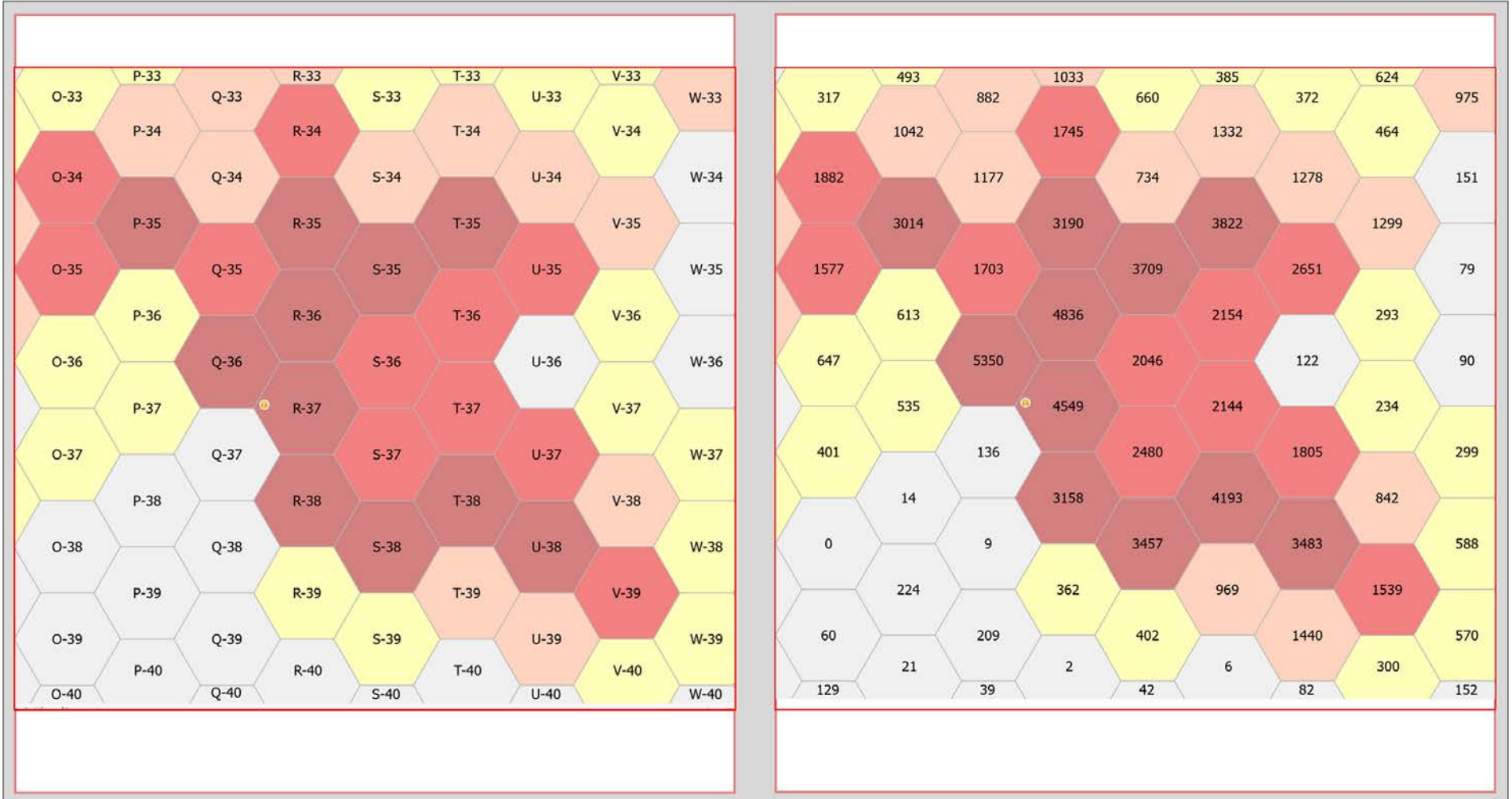
Figure 10 illustrates the hexagon layout and the total number of crimes for the entire decade in each polygon. The distribution portrays a C shape that follows the transportation grid, which demonstrates that some aspects of crime and place is a social construct, and clearly shows the casino at the apex but not necessarily the sole underlying factor in crime creation. The researcher's onsite qualitative assessment attempts to provide additional contributing factors that may be the source of a given hotspot.

Table 3: ACS Population Census Summary Profile[26] - U.S. Census Bureau Data Source

Rank	Hex-Num	Venues	Crime Rate per 1,000	# of Crimes	Popul	House Holds	% English Only	% <19	% >65	% Medicaid	% Below Poverty	% SNAP	% Disability
1	R-38**	Main & Locust South CBD	4821.4	3158	655	291	22%	29%	8%	78%	55%	60%	37%
2	Q-36***	MassMutual/Jazz-Blues	3254.3	5350	1644	1157	42%	12%	15%	36%	49%	63%	42%
3	S-35	State & St. James-Stebbins	1695.9	3709	2187	730	56%	35%	10%	65%	36%	52%	44%
4	R-36	High & School St	1622.8	4836	2980	1456	41%	24%	8%	56%	44%	66%	43%
5	R-37*	Casino - Hotel	1440.5	4549	3158	1392	30%	26%	12%	55%	39%	57%	44%
6	R-35	Federal & Worthington	1428.6	3190	2233	635	38%	44%	7%	72%	41%	53%	37%
7	T-35	State & Sherman-Andrews	1113.3	3822	3433	1252	54%	27%	11%	53%	49%	56%	49%
8	T-38	Belmont & Dickenson	1060.7	4193	3953	1401	41%	29%	5%	56%	37%	42%	39%
9	S-38	Belmont & Ft. Pleasant	1042.8	3457	3315	1413	52%	27%	15%	41%	38%	40%	36%
10	U-38	The X	845.0	3483	4122	1367	50%	27%	7%	60%	42%	39%	33%
5 -> 9	R-37*	Casino - Hotel	405.3	4549	11224	With Casino patron and worker population factored in to the population							
1 -> 10	R-38**	Main & Locust South CBD	368.8	3158	8564	5 Hotels, 17+ Restaurants & several Bars/Taverns							
		*Hexagon where the Casino resides (15,000 daily patrons and 409 employees on any one shift)											
		**Hexagon makes up Main St South CBD of Casino (Some of the patrons and employees will frequent this area as well)											
		***Hexagon where MassMutual Center & popular jazz and blues venues and cuisine is located (Analysis did not extrapolate this population upward due to casino effect)											

Table 3 compares the ten hexagons depicted in the C-shape pattern. The data presented in this table originates from the U.S. Census Bureau and is made available through ArcGIS Pro - Business Analyst tool. Hexagon R-37 contains the MGM Casino and represents the third highest volume of crime (4,536) within its boundary. Hexagon Q-36 had the greatest number of crimes in the decade at 5,350 and is home of the Mass Mutual Entertainment and Convention Center (operated by MGM Springfield). It also houses several restaurants and two popular music venues (a jazz and a blues club) on Worthington Street. R-38 represents the other central business district area and was victim to 3,158 crimes from 2013 to 2022. A Google Maps search resulted in identifying at least five hotels, 17 restaurants and ten bars-taverns in Springfield Central City area (represented by these three hexagons, respectively).

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[26] Appendix D provides an example of the ACS Summary data made available from ESRI used in this table.

Hexagon R-36 produced 4,836 crimes within its boundary, representing the 2nd highest hotspot within Springfield. It is home to Springfield High School of Commerce, Baystate Health and several apartment complexes and social service agencies. The remaining hexagon hotspots consistently extend away from the CBD along State Street and Main Street turning to Belmont Street to the south.

Table 3 offers some causal factors that are explained by Social Disorganization Theory, namely measures of poverty, heterogeneity, and single-parent heads of household (also known as latch-key kids). While this study is not a full examination of social disorganization, these statistics do lend themselves to plausible explanations for why crime occurred in these neighborhoods at higher rates than in other parts of Springfield. With about one-third of residents to about half of them living below poverty levels within each of these hexagons, income appears to be a contributing factor. With four to six out of ten residents on SNAP (public assistance) and over one-third experiencing some form disability, these neighborhoods represent the most vulnerable and at-risk population in the region. These residents are prone to higher rates of victimization than those in other neighborhoods.

While the percentage of kids under the age of 19 represent the crime prone years, these hotspot hexagons represent higher percentages of kids in the crime prone years (30% on average among them) than the national percentage of 23%, except for hexagon Q-36. Likewise, looking at the elderly population who may be more vulnerable, these areas represent a smaller percentage (9.8%) than the national percentage of residents over 65 (17.3%). While this data does not present definitive proof of why these neighborhoods are prone to crime, they do offer points of concern and discussion points for viable programs.

Finally, in regard to Table 3, the researchers of this study calculated the crime rate per population as a point of comparison. Using the U.S. Census residential population initially, the data shows that the MGM Casino hexagon ranks fifth in crime rate per capita at 1,441 crimes per 1,000 persons residing in the area - technically in the middle of the top ten hotspots. R-38 hexagon, the CBD most likely utilized by patrons of the casino for dining and other entertainment, is ranked number one with a crime rate of 4,821 per 1,000 persons.   It should be noted that this crime rate is extrapolated upward due to the small number of residents who live in the hexagon (N=655) given its CBD status. The area with the music venues and the convention-event center ranks second with a crime rate of 3,254 incidents per 1,000 people.

If you were to take into account the daytime or casino population[27], estimated by the number of daily casino visitors or patrons and the number of employees who work there throughout the day, a conservative estimate would increase the potential population by 7,500 (estimated patrons) and 409 (potential employees per shift). By recalculating the crime rates for the two

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[27] This practice of using daytime population is a common practice among jurisdictions that host universities, large manufacturing facilities and other popular attractions like major league baseball, football or basketball venues that significantly increase the number patrons in the vicinity and the overall population during peak times. For communities that experience these daily fluctuations, residential population does not reflect a standard rate solely relying on US Census residents. This is an accepted practice to take this into account.

casino hexagon hotspots based on this adjusted population, their crime rates decrease to 405 and 369 per 1,000 persons, respectively. Consequently, these two hexagon hotspots move to the 9th and 10th positions among the top ten areas with the highest crime rates.

This significant finding suggests that when accounting for the presence of the casino and the population it attracts, the crime rates in the vicinity are not as pronounced as in eight other hotspots found in Springfield. This provides evidence that the casino may not be the primary or sole contributing factor to the observed crime rates. This critical finding sheds light on the limited impact of the casino on crime rates and emphasizes the potential role of increased activity, surveillance, and social organization in the vicinity of the casino in driving down crime.

The remainder of this section will explore specific crime types using ArcGIS Pro *Aggregate Clustering* tool to dynamically visualize hotspots. This function allows researchers to zoom in and zoom out to dynamically visualize hotspots within hotspots and to determine the precise locations that make up a hexagon hotspot.

Figure 11: Burglary Distribution over Area
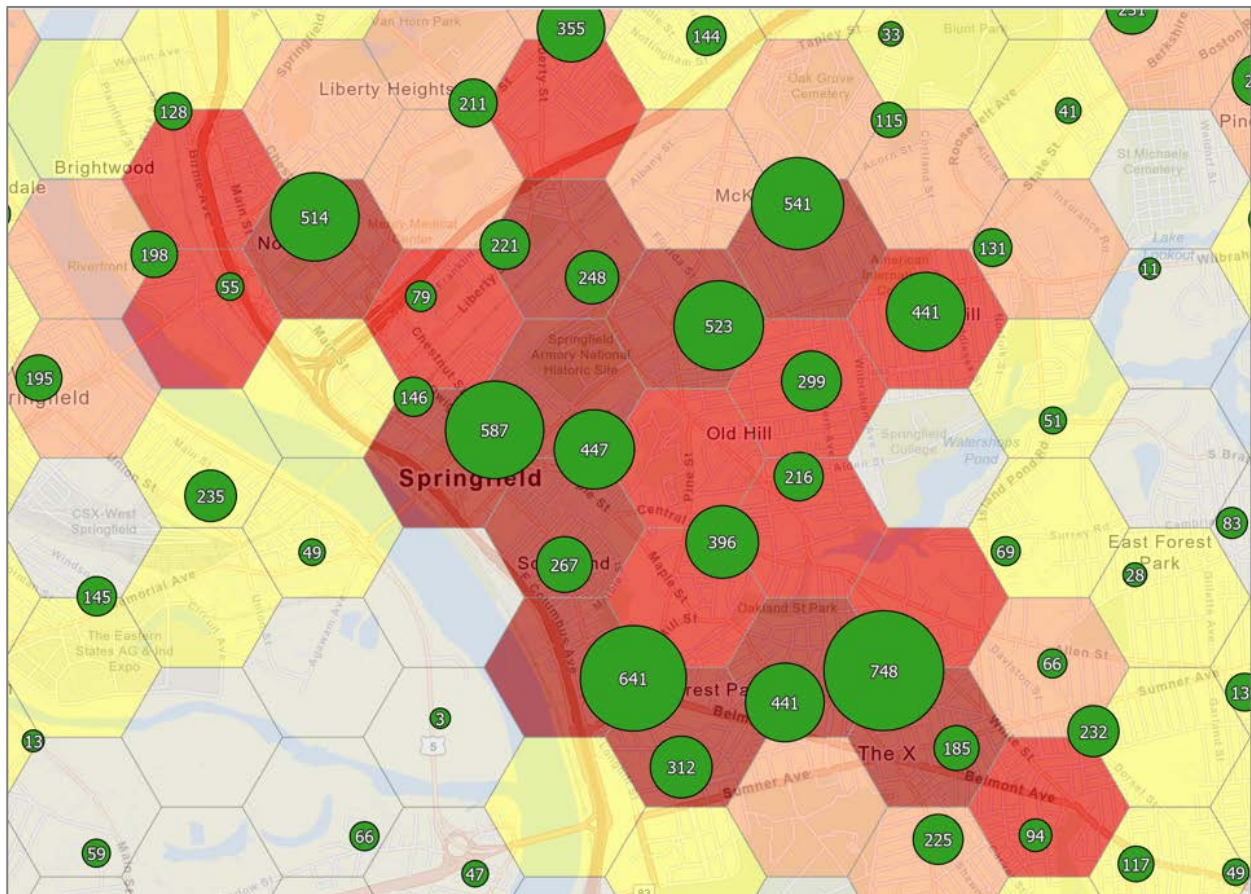
At the extended view of the C-shaped pattern discussed earlier, the graduated symbols for the different crime types illustrate the distance decay effect and where, within each hexagon, each crime type is prolific. Figure 11, displaying burglaries, shows that the highest occurrences of break-ins happened in southern and southeastern region of Springfield at the border of

hexagons U-38 & T-38 (748) and the border of hexagons S-38 & R-38 (641). Apart from the 587 burglaries (some of which could be commercial burglary) at the border of hexagons Q-36 & R-36; most burglaries occurred further away from the casino in the second SDT zone called the working-class zone. Once we get beyond the Central City and the working-class zone, burglary counts diminish substantially. Clearly, as burglary mirrors the C-shaped pattern we recognized, crime followed the transportation network as well.

Figure 12: Fraud-Forgery Distribution over Area
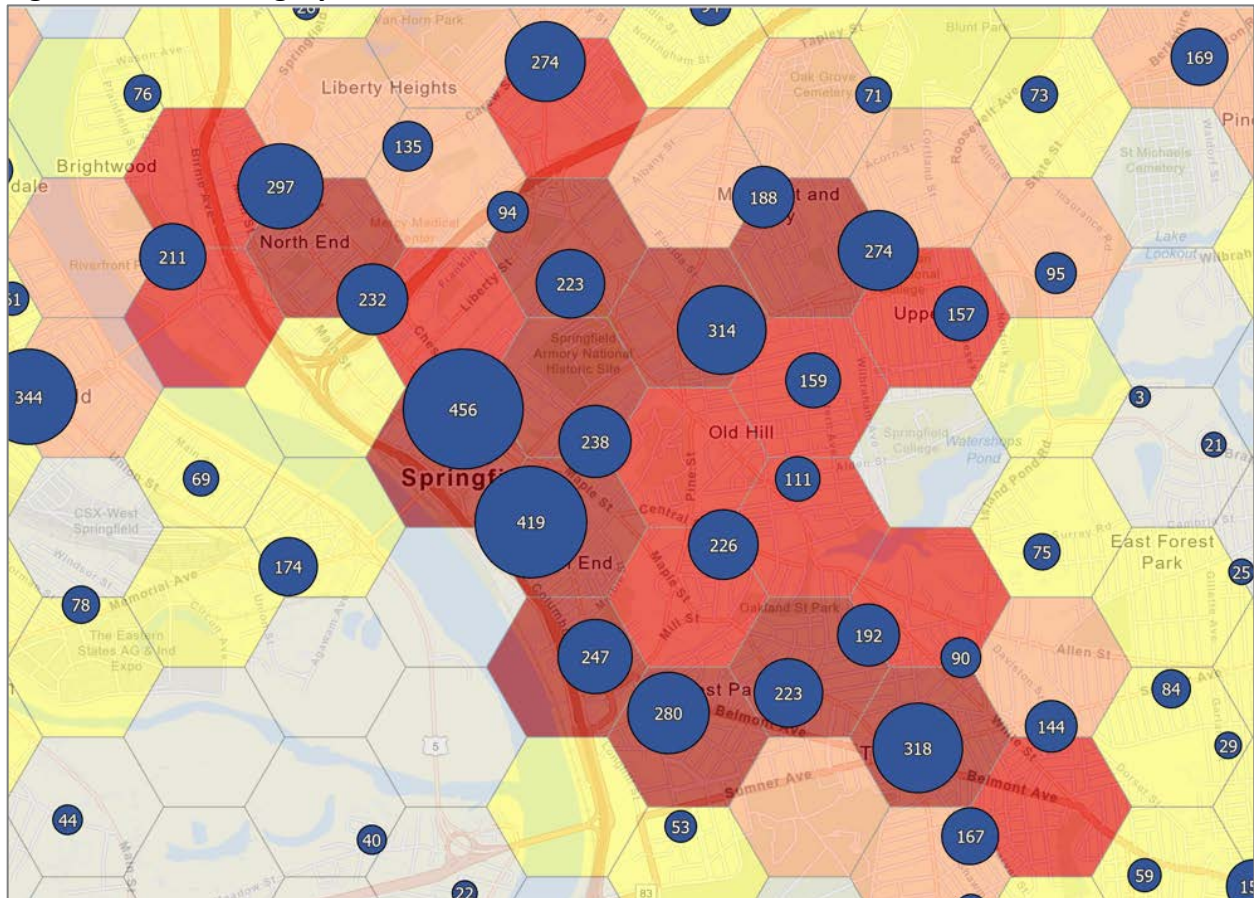
Fraud-Forgery patterns appear to be more concentrated in the CBD and in and around the casino. Figure 12 displays that most frauds-forgeries occurred at the apex of the casino, and this phenomenon needs further analysis for which the limited timeframe was not able to accommodate. Once again, fraud-forgery followed the C-pattern and overlays with State, Main and Belmont streets. There appears to be a pocket for fraudulent activity in West Springfield that the local authorities should explore. This does not imply that the casino is the primary source of fraud, only that the data demonstrated spatial correlation.

Figure 13: Vehicle Crime Distribution over Area

Figure 13 shows that vehicle crime is clearly concentrated in the CBD along State & Chestnut streets and most likely reflects the volume of street parking and surface parking lots near the casino and hotels in the area. Vehicle crime includes Stolen Autos, Theft From Vehicles, and Theft of Auto Part that regularly proliferate at hotels, on streets and in surface parking lots. Once again, vehicle crime illustrates social disorganization theory and significantly diminished as one gets farther way from CBD and the working-class zone. Another micro hotspot is near the Hampton Inn on Columbus and where Main converges with Locust.

Figure 14: Vice Crime Distribution over Area
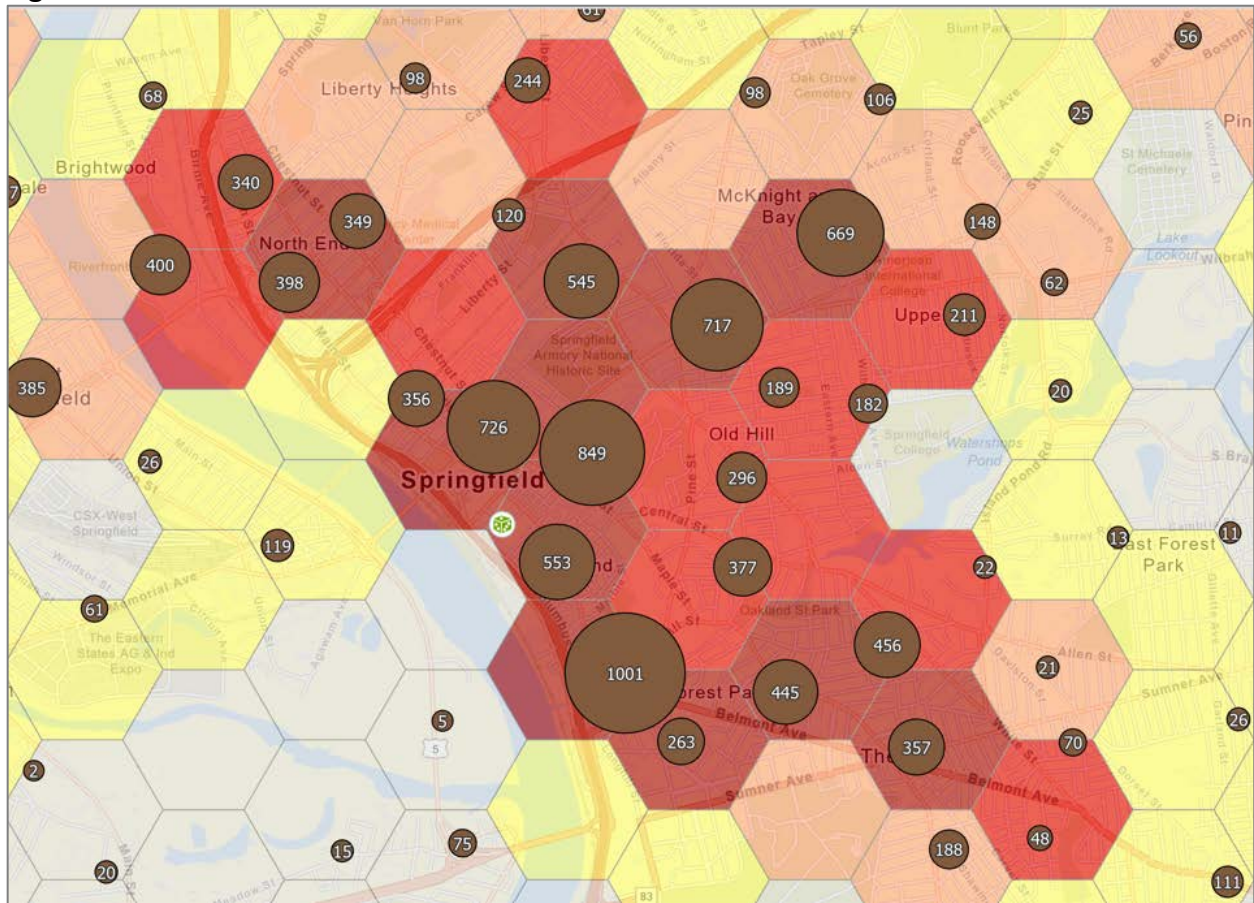
Figure 14 - Vice crime, which includes offenses like drugs, alcohol, drunkenness, drunk driving and prostitution - pornography, follows the general pattern within the CBD and along the major streets. It appears to be most prevalent south of downtown where Main Street converges into Locust, and in Central City near High St and School St and in the Chestnut and Pearl vicinity. Vice continued along State Street as it traveled away from the river or CBD. It is clear that Vice concentrated along the C-pattern and experienced distance decay from the casino. These spatial depictions of crime continued to illustrate that there is a great deal of correlation with proximity to the casino that diminishes as you get farther from the CBD. This does not determine causation and can be explained by contributing factors related to social disorganization theory.

Figure 15: Violent Crime Distribution over Area
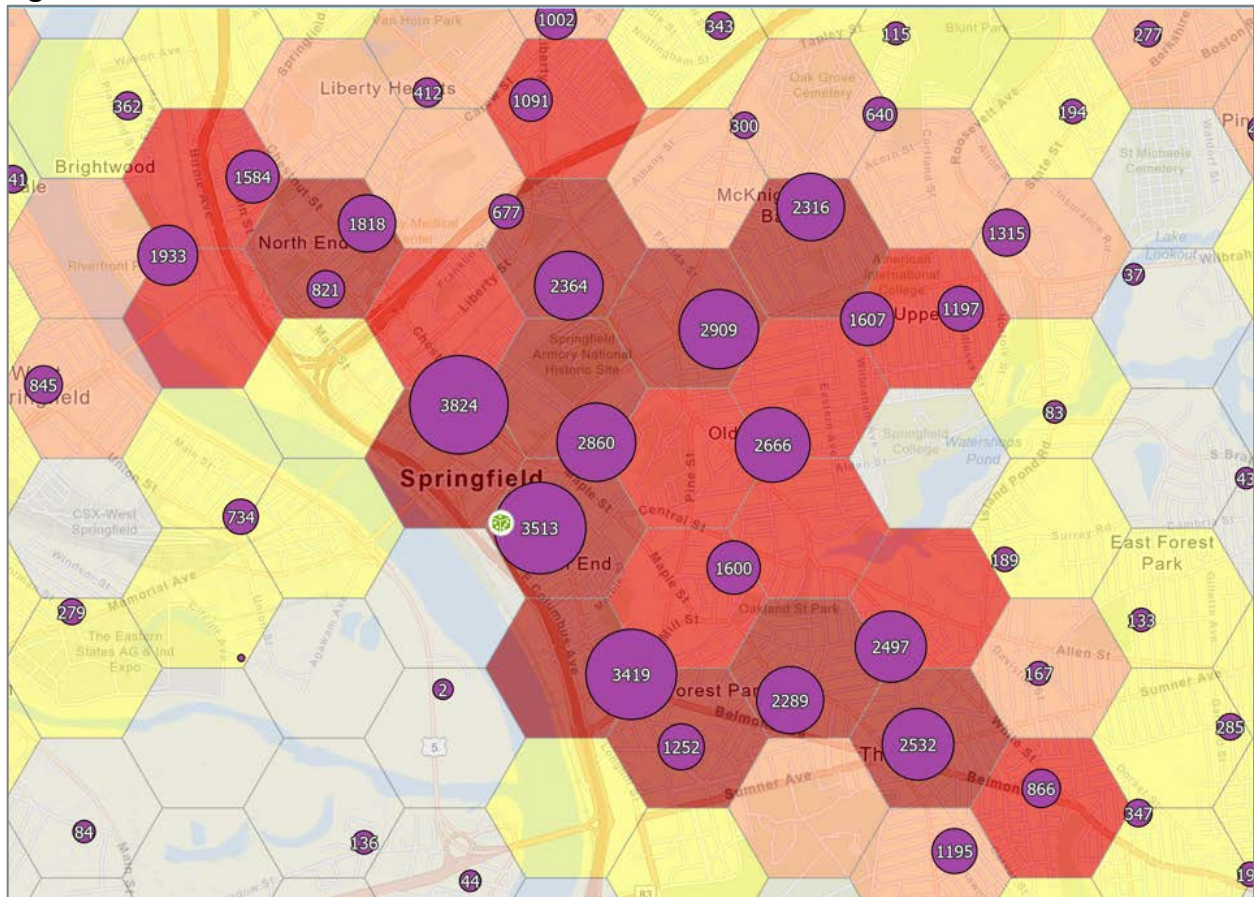
Figure 15 shows that violent crime is more evenly distributed across Springfield and mirrors the consistent pattern of crime along the primary streets. It also behaves in a similar manner as other crime consistent with SDT. Once you get outside the Central Business District violent crime dropped off dramatically. It is profound that each of these crime categories adhered to the same spatial pattern generally speaking. While there are unique hotspots across the crime categories, they continue to maintain support for the social disorganization theory, higher in poverty-stricken areas, along major transportation routes, and demonstrate distance decay from Central City.

The research now turns to a more detailed look at robbery, a crime most people are concerned about, especially patrons who might be visiting a casino community. Again, we see a similar geo-spatial pattern of crime with robbery. Robbery appears to be prevalent in the Sterns Square Park area and less so in and around the MGM Casino.

Robbery over the past decade shown in Figure 16 occurred on busy thoroughfares along State Street, south Main Street and along Belmont to the east.

Figure 16: Robbery Distribution over Area (2013-2022)
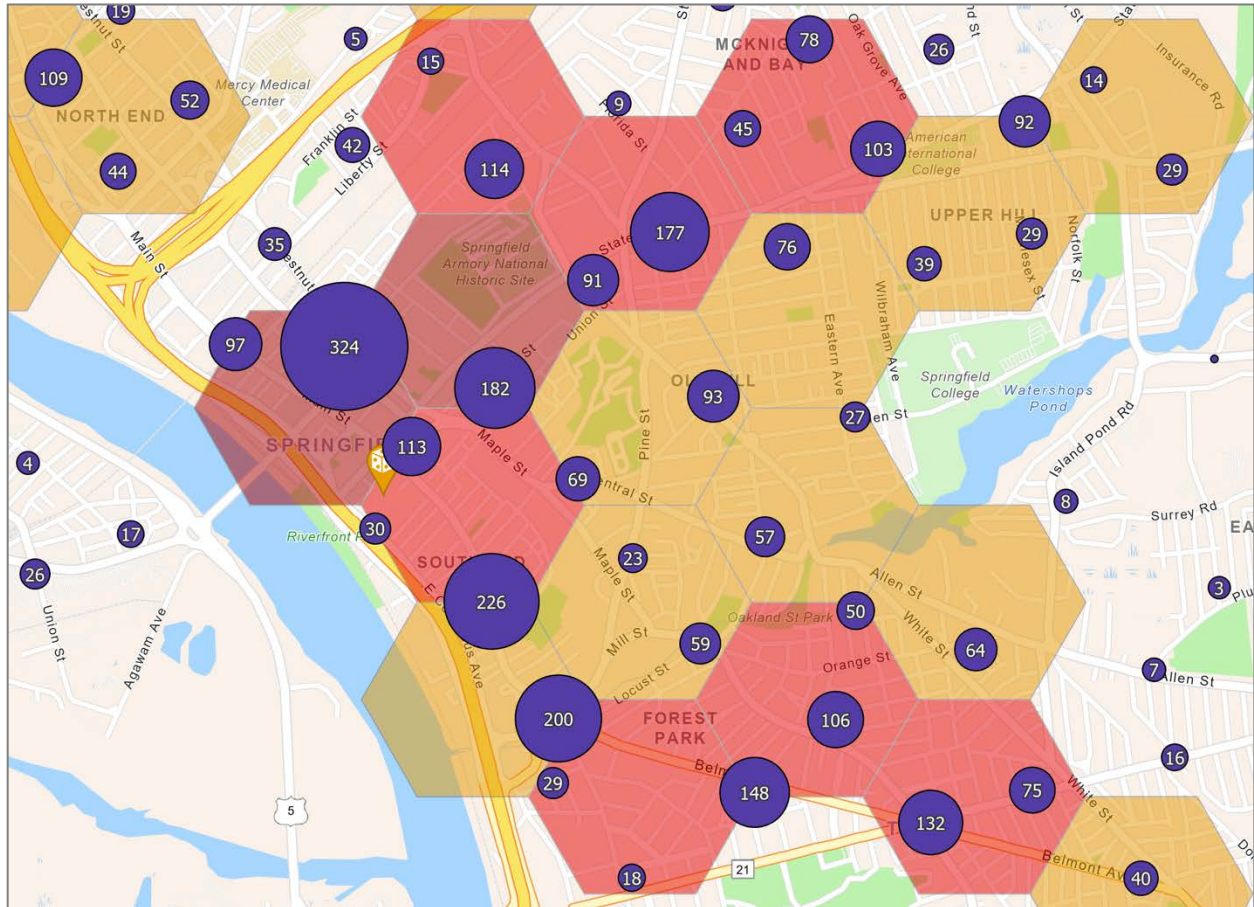
If we focus on 2022, it appears that police efforts[28] in the Stearns Square area near Union Station have paid off with fewer robberies having occurred as illustrated in Figure 17. The one distinct smaller hotspot remained in the High and School Street area with 18 robberies in 2022. Figure 17 shows that 107 robberies occurred in the CBD but on a much smaller scale. Thirty robberies occurred at the end of C-pattern along State Street and 50 persons experienced robbery in "The X" community[29] towards the end of the C-shape on Belmont Avenue.

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[28] Springfield police staff offered this explanation when we met with them during our qualitative review and on-site assessment.

[29] The X community is a local designation for this neighborhood.

Figure 17: Robbery Distribution over Region and within Central City (2022)
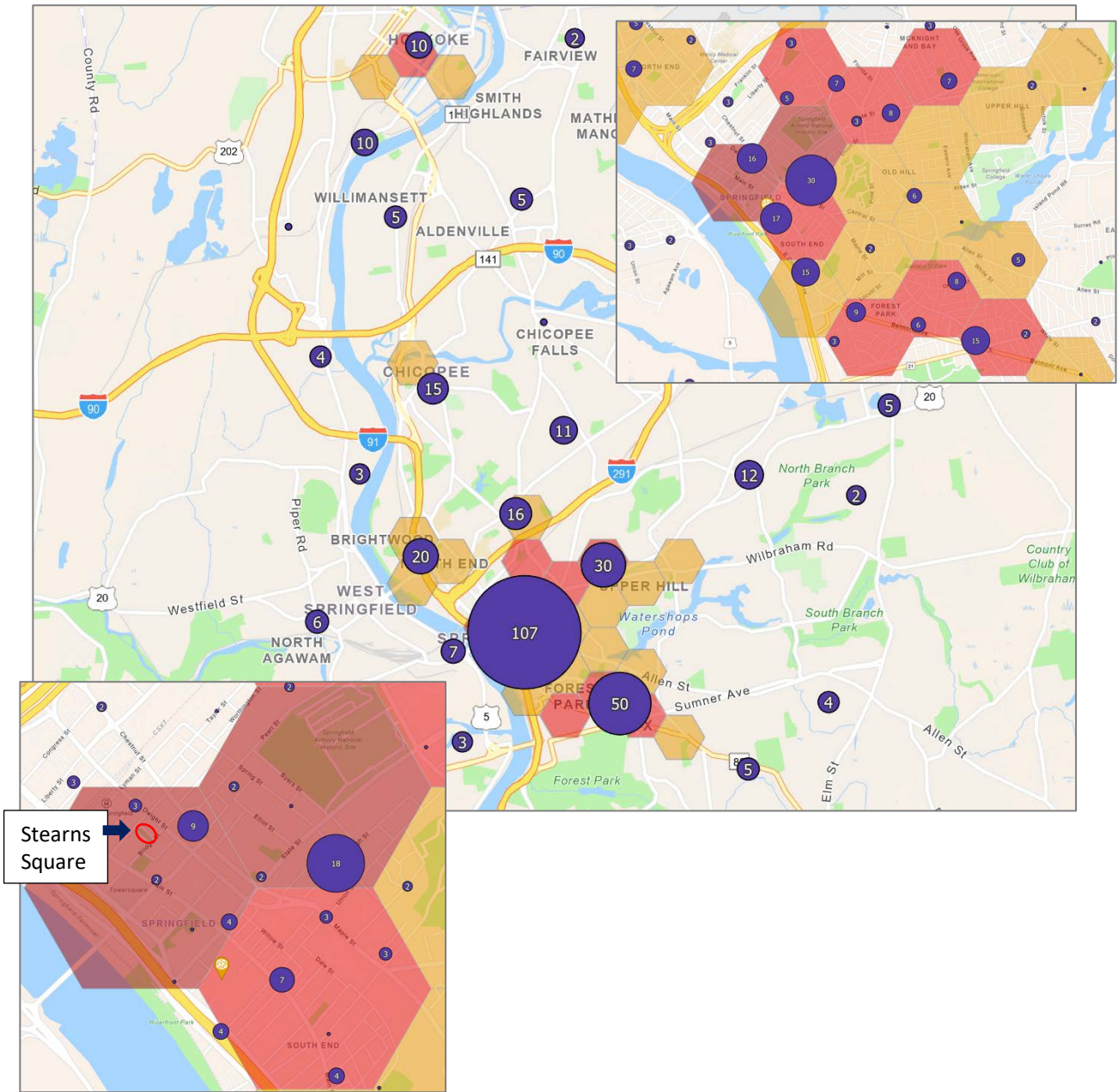
The hotspot at High Street and School Street is made up of apartment complexes and one unique landmark appears to be at the center of this neighborhood and acted as a magnet for activity. The City of Springfield has invested urban development funds into this area as the pictures below display, but the presence of a convenient store draws enough patrons which provided opportunities for robbery apparently. The store is open from 9am to 9pm presently and several environmental design changes have been made that further hardened this target.

Figure 18 shows 18 robberies at this specific location in 2022. The embedded pictures illustrate the commitment to crime prevention and public safety that is needed to reduce crime. Closed circuit TV or the Ring Doorbell may provide additional surveillance to deter future crime.

Figure 18: High Street Convenience Store - School and High Street area.
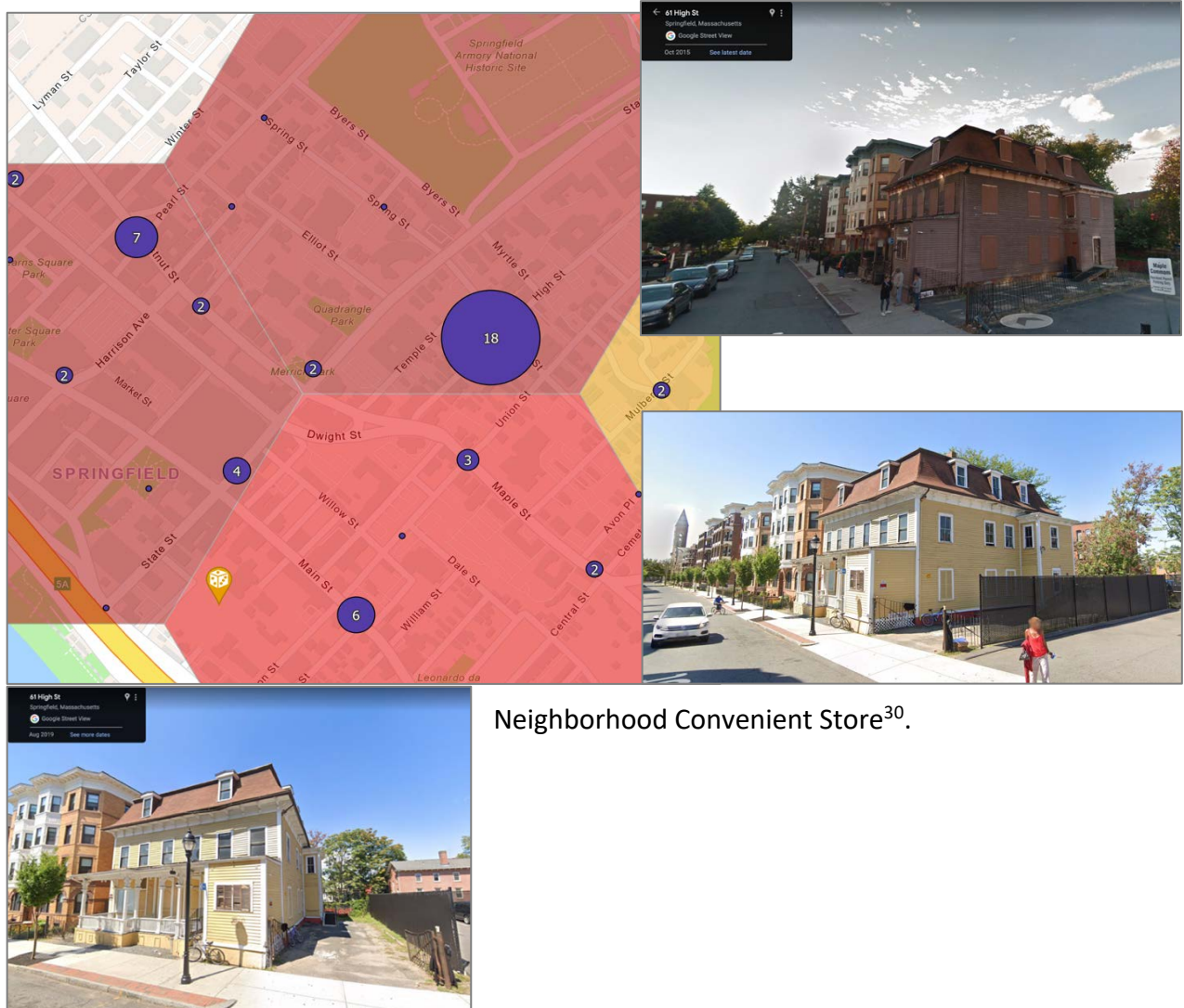
Neighborhood Convenient Store[30].

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[30] In many neighborhoods across the country, local markets serve as food services for under-privileged populations and become a corner hangout, but this social phenomenon also attracts vice and disorder at times. This location in Springfield has the characteristics of a street corner culture. This location had as many robberies in 2022 as the area immediately around the casino.

Springfield has made investments into infrastructure with streetlights and the planting of trees. It remains a robbery hotspot, illustrating the difficulty that exists in changing neighborhood culture. Another hotspot location for Robbery in Springfield includes the crossroads called "The X" where 15 robberies occurred in 2022 (see Figure 19).

Figure 19 - "The X" Neighborhood
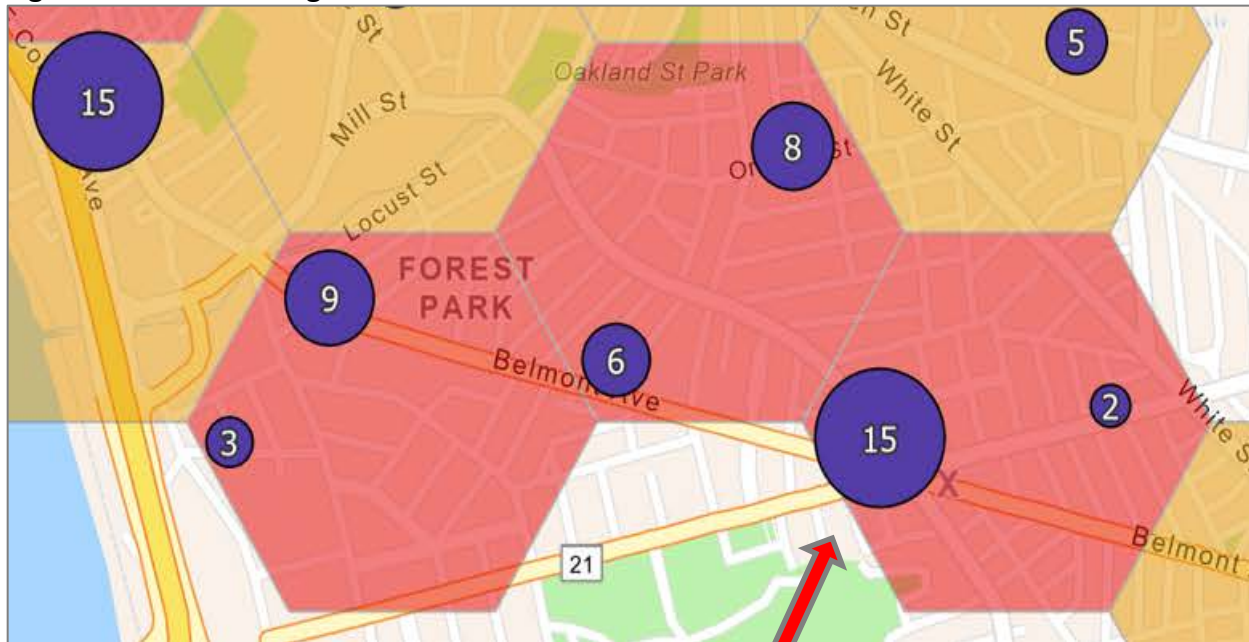
The X (the local designation for this area) - at the intersection of Belmont and Sumner hosts three coffee shops, two drug stores, 8 fast food establishments and a social center. As a business apex it attracts large number of patrons who appear to be prey as vulnerable victims. This is another illustration of how crime hotspots develop and perpetuate. Motivated offenders target these nodes and rationally leverage the easy targets, most likely the factor behind it being a hotspot.

Figure 20: Robbery in Holyoke Hotspot
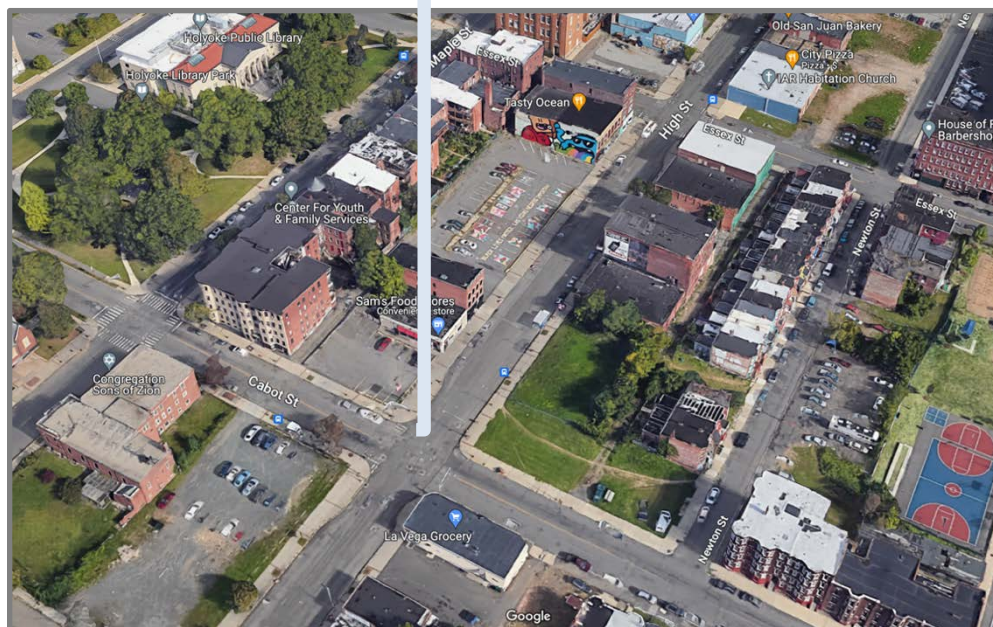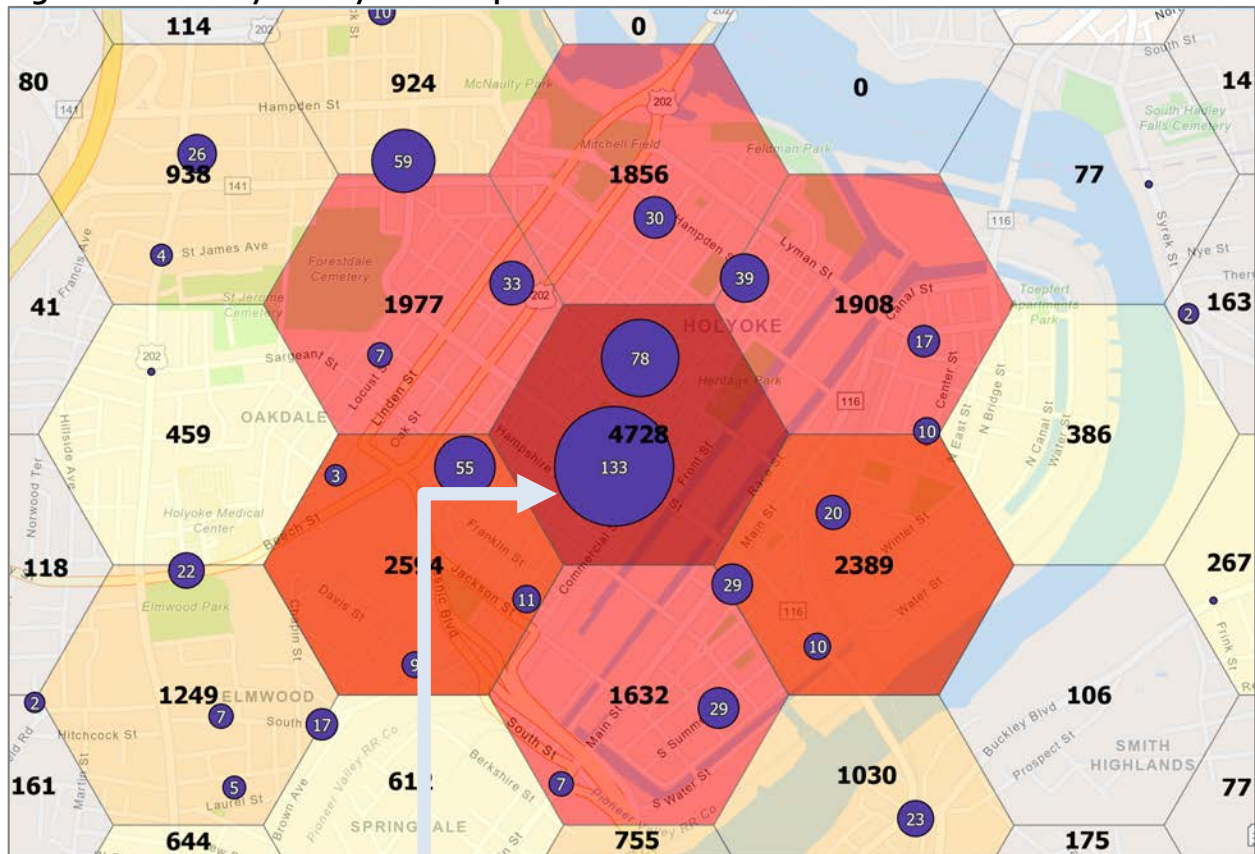
Cabot & High Street (O-23) - Figure 20 illustrates a location with a Juvenile Center, an outdoor basketball court, two neighborhood grocery stores and surface parking - and a social center. Holyoke only had 10 robberies in 2022 at this location, which represented a reduction of 3 on average from the 14 it experienced over the past decade. This hotspot hexagon (O-23) ranked third in crime counts (N=4,728) within the Region and as such deserves public safety attention.

The final hotspot of our onsite assessment was at Thornes Market Place in Northampton (Figure 21). While it was the least active hotspot for crime amongst the others in the Region, it falls into the 13th spot for top locations with 2,891 crimes over the past decade. In the final analysis, this community and the CBD within Northampton looks typical of downtown USA with nice shops and restaurants, and a few bars.

It simply attracts patrons and shoppers who are vulnerable targets for motivated offenders. Once again, we see a Central Business District that had high correlation to crime counts, as would be expected. Public safety continues to look for and find ways to prevent crime, apprehend offenders, and safeguard visitors eager to shop here and entertain themselves. It looks extremely safe.

Figure 21: CBD in Northampton Hotspot (M-8) - N=2,891

The common theme that this drilldown analysis shows is that there is a common theme for robbery, it occurs in highly dense areas with high activity related to bars, restaurants, convenience stores and apartment complexes. This common spatial reality in a Central Business District appears to be more a contributing factor than the presence or absence of a casino.

Micro-analysis of Changes in Crime Statistics

Since the Massachusetts Gaming Commission began evaluating the impacts of the casinos on public safety issues, a key goal has been to identify specific trends in crimes, calls for service, and traffic collisions that might be attributed to the casinos. These trends may include both increases and decreases. Table 4 below summarizes some of the reasons that public safety issues might increase or decrease because of a facility *like* MGM Springfield.

Table 4: Reasons For Increase or Decreases in Certain Issues

Reasons for potential increases	Reasons for potential decreases
Millions of extra people in the area during the year creates many new opportunities for victimization, particularly during extended nighttime hours.	Millions of extra people in the area during the year creates extra mutual guardianship and reduces victim isolation, particularly in nighttime hours.
Other businesses taking advantage of these extra visitors may offer new opportunities for victimization.	Other businesses taking advantage of these visitors increase legitimate activity in the area, again particularly at nighttime, thus providing extra lighting, security, and mutual guardianship.
Risk-motivated individuals[31] in particular may serve as desirable population of victims for fraudsters.	Extra law enforcement presence in the casino area, and in the area in general.
The cash-heavy nature of casinos creates more opportunities for cash-related crimes.	Physical improvements to the area help negate "broken windows"[32] effects and otherwise may make the area less attractive to potential offenders.
"Hedonistic mindset" of some casino visitors ties gambling experiences to drinking, drug use, prostitution.	Extra monitoring and access control in casino area may increase perception of risk for offenders.
Alcohol service at casino creates intoxicated patrons. Intoxicated people are at higher risk of both offending and victimization.	Economic benefits offered by casino may reduce general economic strain in the area, thus reducing several manifestations of crime. This includes the direct hiring of 1,500 plus employees at the casino. Other service industry jobs are created in food and entertainment services as Springfield becomes a tourist destination.
Individuals seeking money for gambling may turn to crime as a source of funds, or those who spend their money gambling may turn to crime as a source of replacement funds.	
Addicted gamblers may suffer financial and psychological strain that manifests in violence and other crimes.	Extra social services funded by casino proceeds or otherwise prioritized for the area because of the casino may alleviate a number of economic, social, and psychological crime causes.
The specific nature of casino operations offers unique opportunities for crimes not present at other locations, including TITO thefts and money laundering.	

[31] Someone who is willing to gamble might be willing to take similar risks on financial deals that turn out to be con games or swindles and this serves as a potential risk.

[32] *Broken windows* is a criminological concept that suggests an area becomes prone to crime as visual signs of deterioration sends signals that no one cares or has any capable guardians monitoring it.

To assess whether the Springfield area experienced any of these causes and effects, we compare post-casino activity in the surrounding area with an expected number of crimes, calls for service, and collisions if the casino had not been built. Notable changes from this expected value do not prove a casino-related cause, but they do provide suggestions for further investigation.

To strengthen conclusions about changes unique to the MGM Springfield area, we compare changes in Springfield to those throughout the rest of Massachusetts during the same period. Changes in activity in the MGM area are not likely to have a casino correlation if they simply mirror changes seen in the rest of the state.

To analyze "statewide" statistics, we obtained data from the Massachusetts Executive Office of Public Safety and Security (EOPSS) as reported under the National Incident-Based Reporting System (NIBRS) program, which standardizes the collection of crime data across the United States. Not every Massachusetts agency reported data to NIBRS during the study period, so our analysis only uses, as comparisons, agencies that consistently reported NIBRS data between 2010 and 2022. Comparative analysis does not include any of the agencies in designated casino areas, including MGM Springfield, Encore Boston Harbor, and Plainridge Park. The comparative dataset is still quite large, representing 268 Massachusetts agencies with a combined population of about five million.

COVID is, of course, a complicating factor in this analysis. For nearly two years, it significantly changed how people interact. For a three-month period between May 2020 and July 2020, businesses at which people could gather and interact—including schools, restaurants, bars, and casinos—were completely closed. For almost a year after that, many facilities remained closed, while others (including the casino) operated under capacity restrictions. These changes in societal patterns resulted in many changes in crime patterns.

Analyzing Changes in Crime in the MGM Area

The basis of our conclusions begins with simple linear trend analysis. For instance, Figure 22 below shows robberies in the MGM Springfield area between 2012 and 2022.

Figure 22: Robbery Trendline

Robberies in MGM Springfield Area Communities

Legend:
- **Actual Values**
- ----- Linear Trend
- —— -1 Standard Error
- —— +1 Standard Error
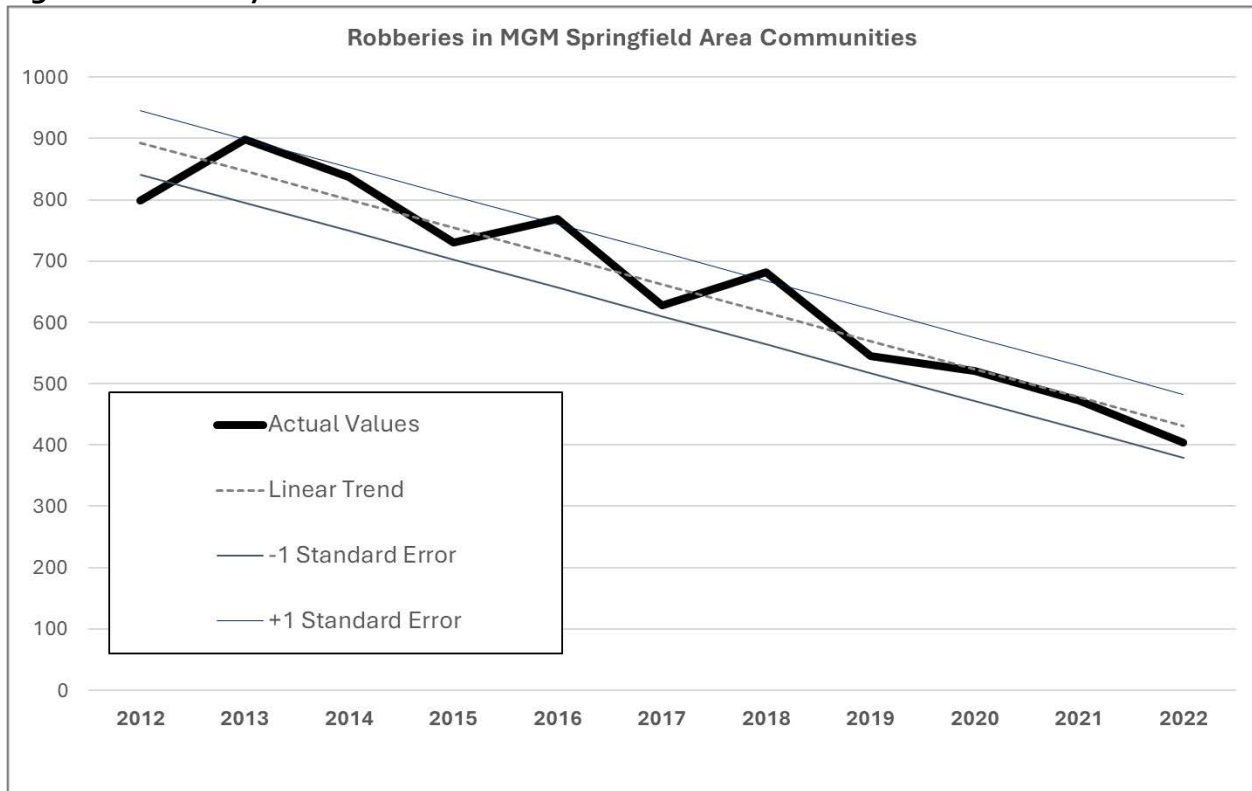
The overall trend in the area has been a downward one, with the average change per year at -40 robberies. The overall decrease between 2012 and 2022 (the extreme ends of the timeline) is -49%. The decrease between 2013 and 2022 (the highest and lowest years) is -55%. Neither the opening of MGM in 2018 or COVID in 2020 and 2021 had much effect on the overall trend; it kept going down. In only a few years did the crime show values outside a window of one standard error, and in those cases, the actual value was barely outside the window.

As a comparison, we look at fraud and forgery (including confidence games, impersonation, identity theft, credit card fraud, and counterfeiting) during the same period in Figure 23:

Figure 23: Fraud and Forgery Trendline

Fraud and Forgery in MGM Springfield Area Communities
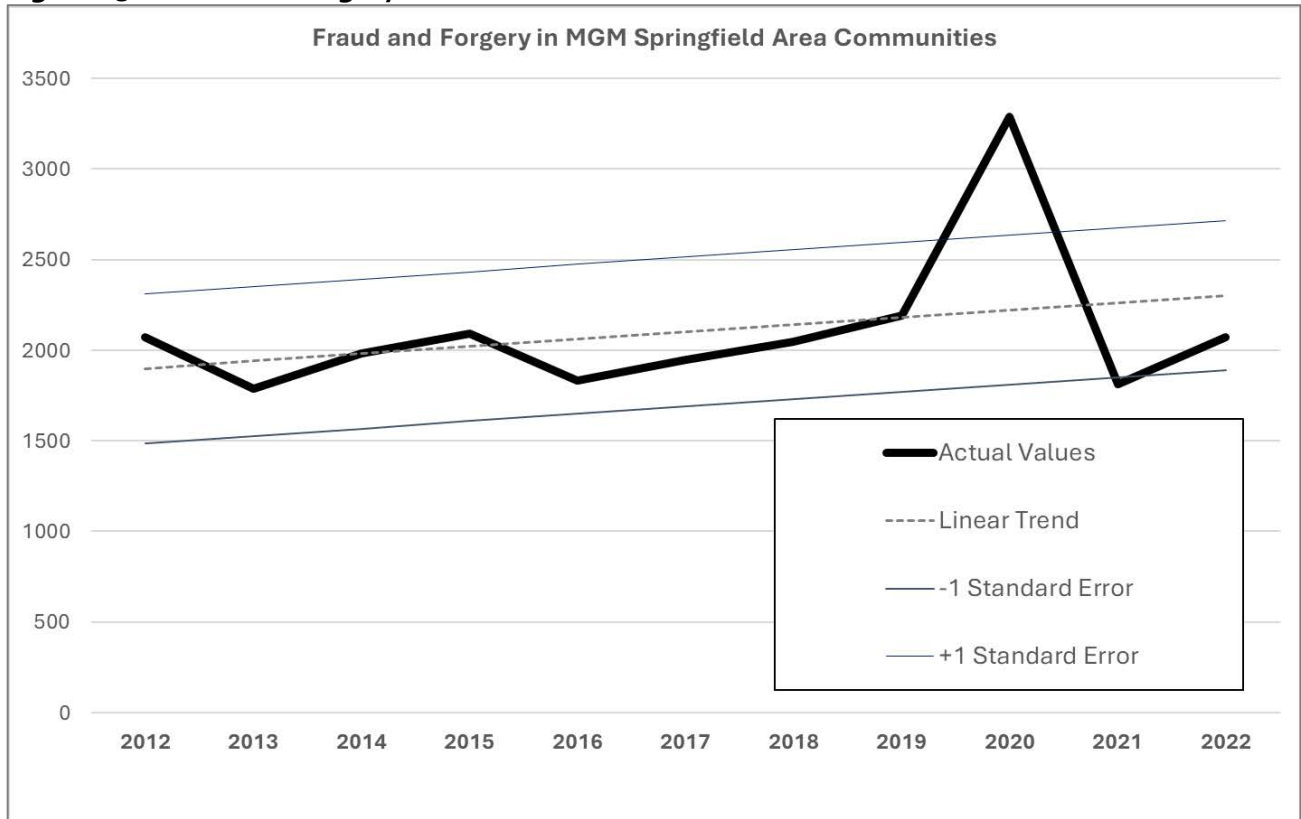
Here we see an increasing trend over the period, but the increase was accelerated by an unprecedented spike in 2020, followed by an equally surprising drop in 2021. Far from being within one standard error of the trendline, the 2020 value of 3,287 incidents is 2.58 standard errors away. The number of standard errors from the trendline is the first basis we use to determine whether a crime is unusually high or unusually low in a particular period. This figure is called the **standardized residual** (abbreviated **SR**).

What was the statewide pattern? Figure 24 illustrates the same pattern from all the state agencies reporting to NIBRS during the same period:

Figure 24: Robbery Trendline For Massachusetts Agencies

Fraud Among Massachusetts Agencies Reporting to NIBRS, not in Designated Casino Areas
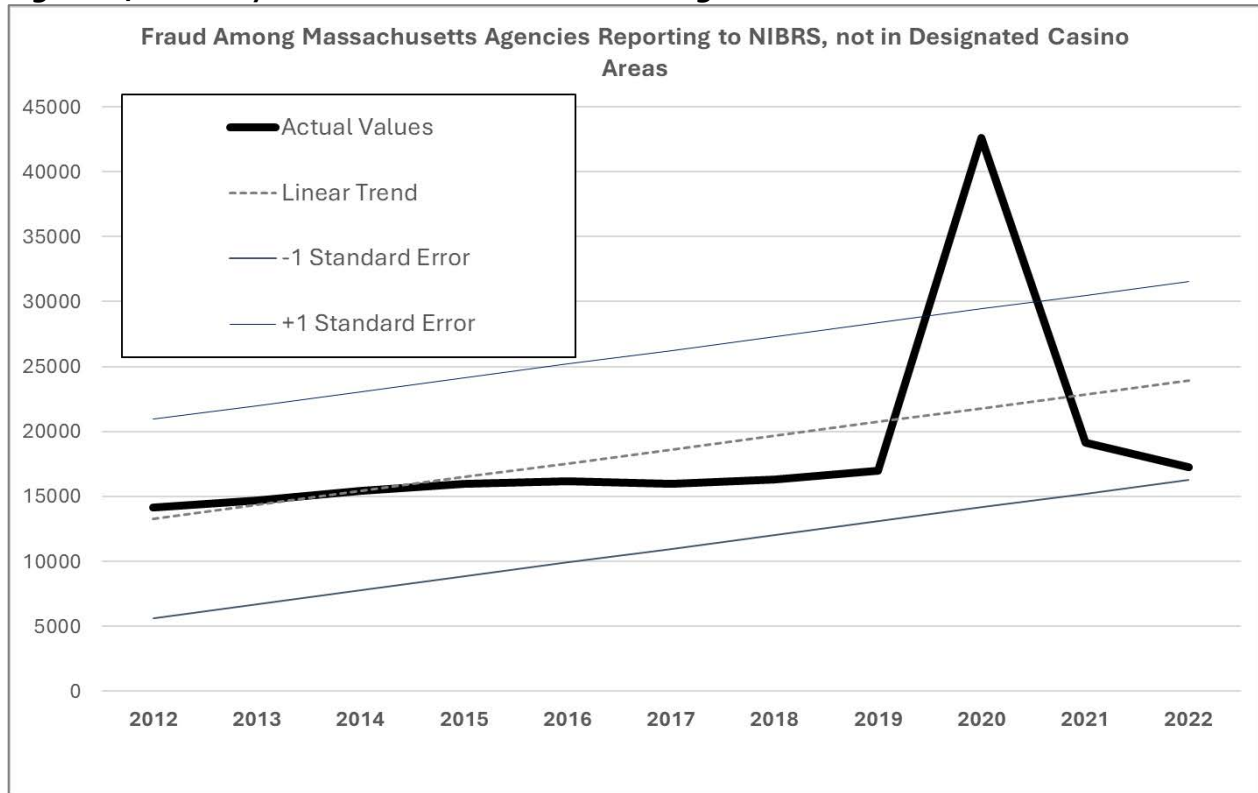
The 2020 spike in the case of the rest of Massachusetts is 2.72 standard errors from the trendline (i.e., a standardized residual of 2.72). Thus, while the MGM-area increase in fraud and forgery is concerning, it mostly mirrors the same increase across Massachusetts and is thus unlikely to be related to the casino specifically.

There are times, however, in which the overall change in the MGM Springfield area diverged from state trends. Here, for instance, we see reports of shoplifting in the MGM Springfield area in relationship to the comparison agencies across the rest of the state in Figure 25. Shoplifting across the state is a good example of how a given crime might fluctuate. In contrast to other crimes, shoplifting in Chicopee was historically much lower the expected state trend and vacillated up in 2019, dropped during COVID-19 only to rise relatively high compared to state projections. Chicopee PD could take a closer look at shoplifting as a primary offense and develop enforcement efforts and crime prevention strategies as a result of these findings.

Figure 25: Shoplifting Trendline
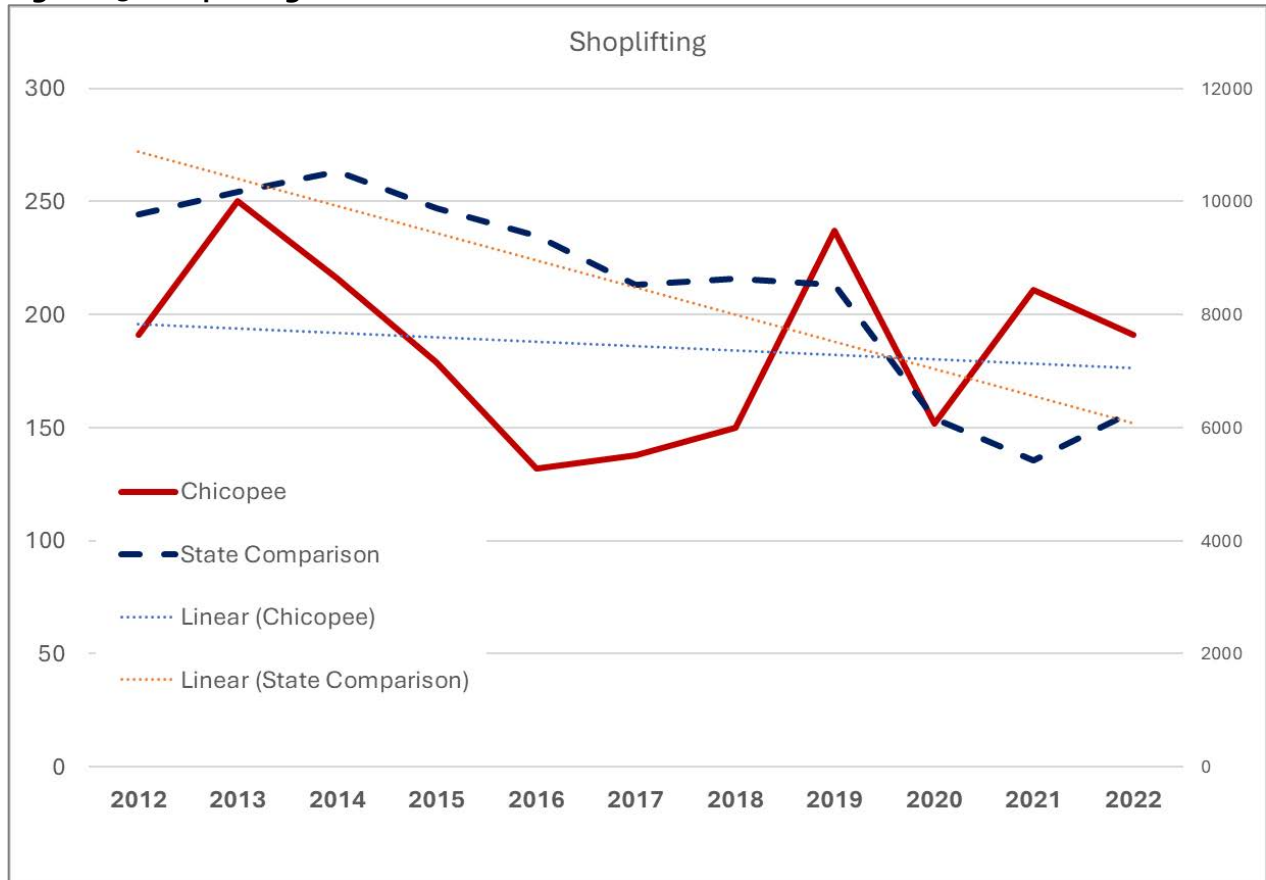
The overall trend is a decrease in both cases, but in the year 2021, comparison had a score of -1.45. In other words, the comparison agencies had far fewer shopliftings than the trendline would have anticipated. Chicopee, on the other hand, had an SR of 0.79. In raw terms, that isn't very much—it's within what we would call a "normal window" for that crime. But in comparison to other Massachusetts agencies, it is relatively high.

Next we turn our attention to a comparison of expected values given the downward trend and use an index we define as the **comparative change index (CCI)**[33] as the absolute difference between the standardized residuals (SRs) for the MGM area and the SRs in the comparison area—in the case of shoplifting in 2021, the CCI is +2.23 (0.79 − 1.45) for Chicopee, indicating a trend worthy of further analysis.

The CCI measures not just how much the category changed from the past but how much it changed from the past *in comparison to the rest of the state*. A CCI of 0 indicates that the MGM area and the state are in perfect alignment, whether up or down. A CCI of greater than 0

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[33] The CCI cut points were selected by the researchers because we have found no other methods for measuring differences between expected trend values and actual values to exist. In an attempt to measure whether a given value of crime counts fluctuates from the expected trend line, the CCI offers a metric for this assessment. If other researchers are interested in replicating this technique or formula, please do not hesitate to contact the authors.

indicates that MGM had more crime than expected based on state trends; a CCI of less than 0 indicates that MGM had less crime than expected based on state trends. A decrease could still produce a positive CCI, if the MGM area only decreased a small amount while the rest of the state decreased a lot. Similarly, an increase could produce a negative CCI, if the rest of the state increased a lot but the MGM area only increased a little.

We have calculated SRs and CCIs for every combination of offense, offense category, and geographic area within the MGM region. Geographic areas include both entire jurisdictions (e.g., the city of Springfield) and individual quarter-mile hexes. Given that previous reports have already analyzed notable deviance from expected values in 2019, and given that COVID caused crime trends in 2020 and 2021 that overwhelmed other societal factors , we have focused the bulk of our analysis on 2022.

Overall trends

Table 5 below can be interpreted as follows:

- **Yearly average** is the annual mean between 2012 and 2022.
- **Slope** is the average yearly change on a linear trendline.
- **2020 and 2021** are the annual figures for those years, offered simply for comparative purposes.
- **Expected 2022** is where the predicted 2022 figure is calculated and where it would fall on the linear trendline based on 2012 through 2021 data. 2020 and 2021 were aberrant years, and we considered excluding them from the trendline calculations. However, when we analyzed statewide data, we found that including those years better predicted crime in non-casino areas in 2022 (average SR of 1.57) than basing the trendline solely on 2012 through 2019 (average SR of 2.13).
- **Actual 2022** is the figure reported in that calendar year.
- **2022 SR** is the standardized residual for 2022—the difference between the actual figure and the expected figure as represented by the number of standard errors from the trendline.
- **2022 CCI** is the difference between the SR for the MGM area and the SR for the rest of the state.

The 2022 SR tells us how unusually high or low the crime was in 2022 compared to the past trendline. The 2022 CCI tells us how unusual the SR is compared to the rest of the state.

2022 was a volatile year, both statewide and in the MGM area. Many crimes that had been trending resolutely in a particular direction reversed that direction in 2022, for better and for worse. In a typical linear regression model, around 70% of the values should have an SR of between -1 and 1, and 95% should have an SR of between -2 and 2. In 2022, in contrast, only 37% of crimes in the state comparison dataset had an SR between -1 and 1, and only 71% were between -2 and 2. There were a lot of extreme values, mostly high, including miscellaneous larceny (+6.99), weapon law violations (+4.86), thefts of vehicle parts and

Table 5: 2022 offenses, actual to expected values, all MGM-area communities

Offense	Yearly Avg.	Slope	2020	2021	Expected 2022	Actual 2022	2022 SR	2022 CCI
Murder	23.9	1	29	24	28	27	-0.16	-0.41
Kidnapping	95.4	0	80	100	95	92	-0.22	-0.10
Sexual Assault	370.5	-8	297	315	325	382	1.60	1.48
Robbery	662.1	-44	521	472	444	404	-0.74	-2.53
Aggravated Assault	1688.3	-4	1638	1752	1667	1681	0.22	-3.06
Simple Assault	5094.8	-164	4230	4341	4254	4470	0.80	-1.05
Threats	2701.7	-99	2210	2395	2194	2336	1.20	-1.85
Arson	66.5	-5	64	47	38	63	1.83	0.40
Extortion	24.5	3	36	33	43	32	-1.01	-4.22
Burglary	2428.4	-348	1343	1183	638	1189	2.76	-0.31
Theft from Persons	59.3	-2	49	22	50	32	-0.91	-1.87
Purse-Snatching	44.3	1	43	62	47	81	2.37	1.34
Shoplifting	1488.1	-20	1294	1318	1376	1522	1.24	0.85
Theft from Building	1224.2	-116	735	757	616	902	1.35	-1.72
Theft from Machine	5.3	0	2	0	8	0	-1.03	-1.81
Theft from Vehicle	1358.1	-85	1182	875	915	1093	1.18	-0.59
Theft of MV Parts	413.2	38	500	651	605	567	-0.36	-4.83
Other Theft	4182.9	-576	2635	2534	1164	2670	2.23	-4.76
Auto Theft	998.4	-40	891	939	782	945	2.24	1.10
Forgery	299.2	-13	192	215	229	272	0.91	-3.27
Fraud	628.5	-6	610	501	596	634	0.59	3.15
Credit Card Fraud	304.9	25	450	319	435	380	-1.00	-0.49
Impersonation	719.3	27	1796	510	882	567	-0.78	0.40
Welfare Fraud	7.3	3	24	46	26	7	-1.59	-0.34
Wire Fraud	36.9	11	76	83	88	109	1.50	1.87
Identity Theft	120.3	-26	123	115	83	76	-0.48	0.78
Hacking	5.0	-1	6	4	4	5	0.82	2.57
Employee Theft	48.8	-4	17	20	28	31	0.16	-2.26
Stolen Property	273.7	-10	232	218	221	222	0.03	-3.10
Vandalism	4090.5	-201	3500	3497	3031	3637	2.98	0.59
Drugs	1400.0	-85	881	1057	990	847	-1.04	0.30
Drug Equipment	2.7	0	2	2	1	6	2.12	0.37
Incest	7.5	1	7	12	10	13	1.64	0.31
Statutory Rape	57.2	4	65	70	77	69	-0.87	-1.27
Pornography	62.4	7	71	94	101	80	-2.62	-2.87
Gambling	7.0	2	11	20	14	23	1.56	1.99
Prostitution	42.1	-8	2	23	1	10	0.54	-0.39
Bribery	2.0	0	2	2	2	9	8.93	8.27
Weapons	647.5	49	864	892	889	944	0.95	-3.91
Animal Cruelty	18.5	4	14	21	23	25	0.58	3.33

accessories (+4.48), counterfeiting and forgery (+4.18), and aggravated assault (+3.28). All these crimes had been trending down rapidly between 2012 and 2021 and reversed direction in 2022, some of them showing the highest totals in the 10-year dataset.

The MGM area showed similar instability in 2022, though it was slightly more stable than the rest of the state: 46% of crime categories had an SR of between -1 and 1, and 79% were between -2 and 2. In Table 5, we can see some crimes, like vandalism, occurred at a higher-than-expected rate than elsewhere in the state, resulting in a somewhat modest CCI. We see other crimes, like aggravated assaults, which seemed almost perfectly in line with the historic trend (SR = 0.22) but were quite low in the MGM area compared to the increase experienced by the rest of the state (CCI = -3.06).

Based on this analysis, the crimes that showed the most unexpectedly high values in the MGM area were bribery, vandalism, burglary, purse snatching, auto theft, miscellaneous theft, drug equipment violations, and arson. All had SRs of greater than 1.75, a value that serves as a good demarcation for "statistical significance." But all of them except bribery were also high statewide, resulting in low CCIs.

The crimes that increased the most in comparison to the rest of the state were bribery, animal cruelty, fraud (specifically, the "con game" style of fraud), hacking, gambling offenses, and wire fraud. All have a CCI greater than 1.5, which serves as a good demarcation of statistical significance for that metric.

Only one crime—pornography—showed a significant decrease in raw terms. Several crimes had notably low CCIs, including theft of vehicle parts, miscellaneous theft, extortion and blackmail, weapon violations, counterfeiting and forgery, stolen property offenses, aggravated assault, pornography, robbery, thefts from persons, threats, and thefts from coin-operated machines.

Overall, there were an equal number of positive and negative CCIs; the average for all crime categories was -0.26.

"Most Changed" Crimes in the MGM Area in 2022

We repeated the analysis above for 9,580 combinations of crimes (including both broad categories and individual offenses) and geographic areas (including entire towns and small hexes). Rather than present all of these statistics here, which would take more than 200 pages, we have instead chosen to highlight values with a CCI greater than +/- 1.5 and an SR greater than +/- 1.75 in Table 6 and 7; in other words, crimes that are notably off their trendline *and* in a way that defies the rest of the state.

These cutoff points were chosen because they represent the most extreme outliers in the dataset. By the nature of its calculation, SRs of greater than 1.75 or less than -1.75 will only appear randomly about 8% of the time in a given dataset; 92% of the time, the value will *not* be random, but a sign of some new factor influencing that particular outlier.

The CCI helps determine whether the influencing factor is unique to the MGM area or whether it has also been experienced by the rest of the state. An MGM-region SR of 1.75 is notable by itself, but not very notable against a state SR of 1.5 (CCR of 0.25). To our knowledge, the CCI cannot be standardized to a specific level of statistical significance. However, a SR of +/- 1.75 accompanied by a CCI of +/- 1.5 occurs in only 1% of the combinations in the dataset (94 out or 9,580), thus representing the most extreme outliers. The goal in this analysis is not to prove to a particular level of significance that the casino caused an increase or decrease in a particular crime but rather to select for further analysis a manageable list of those crimes *most likely* to have been influenced by the casino.

Table 6: "Most increased" offenses in MGM area, by agency, standardized residual and CCI

Offense	Agency	Yearly Avg.	Slope	Expected 2022	Actual 2022	2022 SR	2022 CCI
Bribery	Chicopee	1.0	0	1	9	23.50	22.84
Extortion	Northampton	0.6	0	1	4	7.33	4.12
Vandalism	West Springfield	293.5	-17	196	331	5.92	3.53
Drug Offenses	Longmeadow	6.6	-1	3	9	3.05	4.39
Shoplifting	East Longmeadow	53.3	-2	37	78	3.61	3.22
Purse Snatching	Springfield	19.3	1	19	59	3.65	2.63
Kidnapping	Holyoke	7.8	0	5	15	2.76	2.88
Sexual Assault	Northampton	36.5	-1	29	46	2.84	2.72
Drug Offenses	East Longmeadow	27.3	-6	0	12	1.85	3.19
Drug Offenses	Northampton	81.4	-12	18	42	1.84	3.18
Vice Offenses	Chicopee	341.5	7	372	436	1.90	2.86
Vice Offenses	East Longmeadow	72.5	-11	14	34	1.88	2.84
Credit Card Fraud	Chicopee	16.7	-3	1	10	1.98	2.49

Notes on these increases:

Bribery is rarely recorded by any municipal agency, so for one to have 9 incidents in a year is almost unprecedented. A review of the incidents in Chicopee shows that this NIBRS code is attached to incidents throughout the year in which the textual offenses is "POLICE OFFICER – MISLEADING A." As that offense text does not describe anything that sounds like bribery, our suspicion is that the agency's records system is translating that offense to the wrong NIBRS code, and that these are not bribery incidents at all. Chicopee Police should verify these reports to be certain. In any event, among the incidents, there is no consistency in time, date, location, or participants. The city suffered a couple of municipal scandals in 2022, but we are not aware that any of them relate to bribery.

Extortion is another somewhat rare crime, making Northampton's four incidents unusual despite the low volume. The four incidents show no consistency in terms of dates, locations, and participants, and three of the four have the offense text as "EXTORTION BY THREAT OF INJURY," which frankly sounds more like a robbery than an extortion. This again may be an RMS translation issue.

Vandalism in West Springfield, in contrast to the two issues above, cannot be explained as an error of coding. The agency's 2022 total was higher than any year in the previous decade, and nearly 100 incidents higher than the 232 it reported in 2021. The increase does not seem to be the product of a single massive spree as often happens with this category. An analysis of location types and offense codes suggests that much of the increase is made up of damage to vehicles.

A geographic analysis shows that Riverdale Street (State Route 5) accounts for about half of the incidents. The map in Figure 26 shows a long cluster of increased hexes running down Riverdale Street from the Holyoke border to Elm Street. There is no street parking on this busy route; the incidents are occurring in business parking lots. There is no particular temporal pattern to speak of.

Figure 26: Vandalism Hexagons
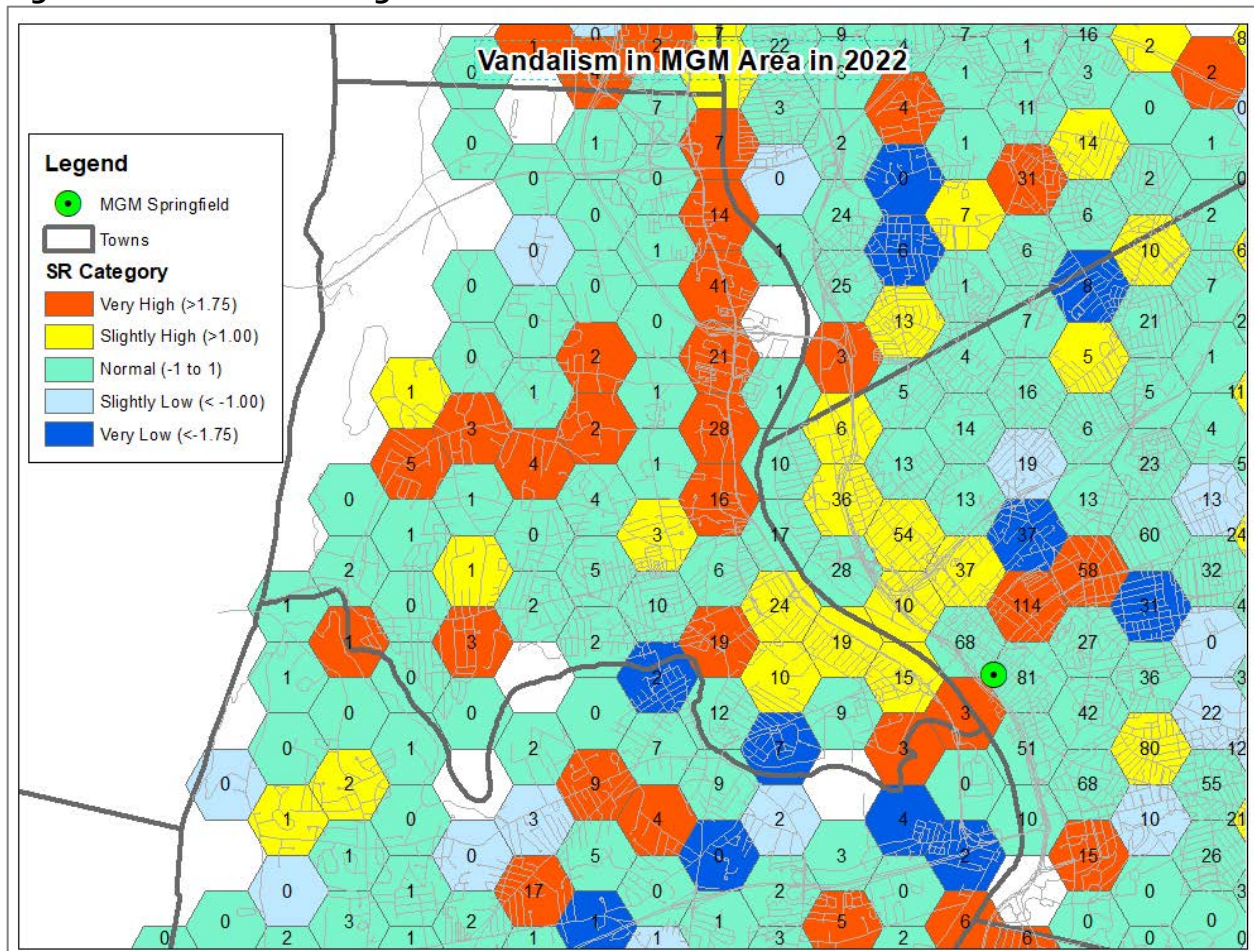
There are other hexes with increased SRs in the city, but most have very low values (3 incidents or less). We would note that a couple of hexes near MGM in Springfield, centered on State Street, also showed notable increases. The crime type isn't one that has a logical connection to a casino, however, and we cannot make a direct or indirect argument that ties the increases to MGM.

Drug Offenses increased in Longmeadow, East Longmeadow, Northampton, and Chicopee (reflected in the city's high "vice" total). The raw numbers are somewhat low for the first two agencies, and in all three cases, the 2022 totals are slight increases after a decade's worth of decreases. In this case, we believe the predictive model to be unrealistic. The decreasing trend was a result of the legalization of marijuana in 2017 and could not realistically have been expected to continue.

Shoplifting in East Longmeadow hit its highest total in a decade, a sharp and sudden reversal of a trend that had produced the decade's lowest total (29) in 2021. The increase is localized almost entirely at the Stop & Shop on North Main Street. A lack of corroborative increases at other stores in East Longmeadow and elsewhere suggests to us that the effectiveness of store security or a change in store reporting policy is at work.

Purse Snatching in Springfield hit a record high in 2022, rising to 59. The previous year was also high at 38; the decade average before that was only 13. This is the type of crime that could increase with a facility like a casino. Figure 27 (below) illustrates a slight spatial relationship, with about half the incidents occurring within a half mile of the casino, particularly in the 16:00-20:00 time block. The puzzling thing, though, is that half of the incidents, accounting for nearly all of the increase, have a location type of "residence," which is unusual if not impossible for this crime. We would suggest that the Springfield Police verify the accuracy of this code before basing any conclusions on these figures.

Figure 27: Purse Snatching in Springfield
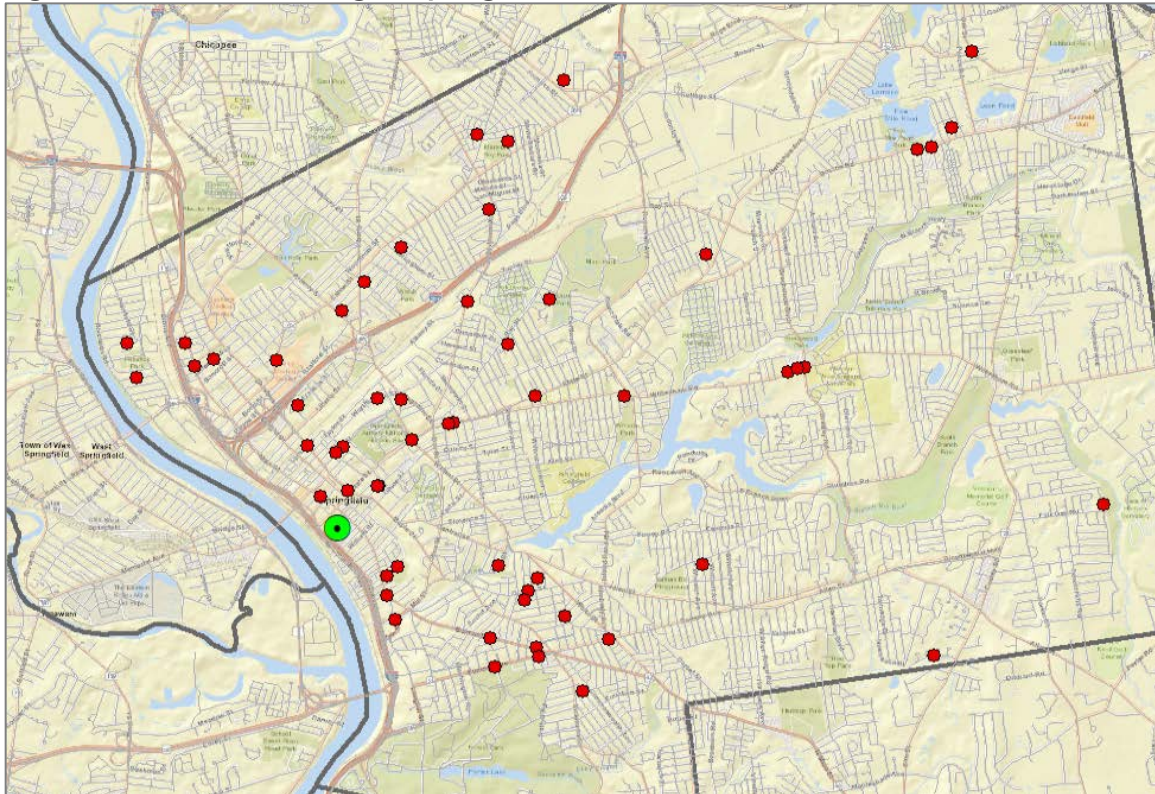
The increases in **kidnapping** in Holyoke and **sexual assault** in Northampton are difficult to analyze given the limited data we were able to collect on domestic crimes and sexual assaults. Northampton did attach multiple reports to a physical therapist accused of abusing patients for at least 10 years, partly explaining the higher total. Chicopee showed a high **credit card fraud** total, but the data suggests these are almost all online purchases using credit cards of Chicopee residents, not incidents happening specifically in Chicopee.

Table 7 shows some notable decreases in the region. While these are the ones selected by our statistical model, there were a lot of lesser decreases. In particular, **robbery** was below its projected total in every community except Longmeadow (which only had 3). Both **violent crime** and **vehicle crime** remained normal in the area despite an uptick in the rest of the state.

Table 7: "Most decreased" offenses in MGM area, by agency, standardized residual and CCI

Offense	Agency	Yearly Avg.	Slope	Expected 2022	Actual 2022	2022 SR	2022 CCI
Shoplifting	Northampton	134.1	-6	117	96	-2.22	-2.60
Robbery	Agawam	8.0	1	12	5	-1.82	-3.61
Pornography	Holyoke	5.3	1	10	3	-2.88	-3.14
Simple Assault	Chicopee	658.0	-13	608	429	-2.54	-4.40
Extortion	Springfield	15.8	3	31	15	-1.87	-5.08
Violent Crime	Chicopee	1274.3	-8	1256	1036	-1.88	-5.80
Weapon Offenses	Agawam	9.5	1	17	9	-2.99	-7.85

Changes in the Immediate MGM Area

We applied the calculations above to the downtown metro area (see Figure 28) immediately surrounding MGM. It is important to keep in mind that these figures only include crimes reported to the Springfield Police Department, which generally do not include incidents inside the casino. These are reported to the Massachusetts State Police Gaming Enforcement Unit and are not part of our data collection. These figures thus represent the surrounding streets, businesses, and local community.

Figure 28: Springfield Hexagon IDs
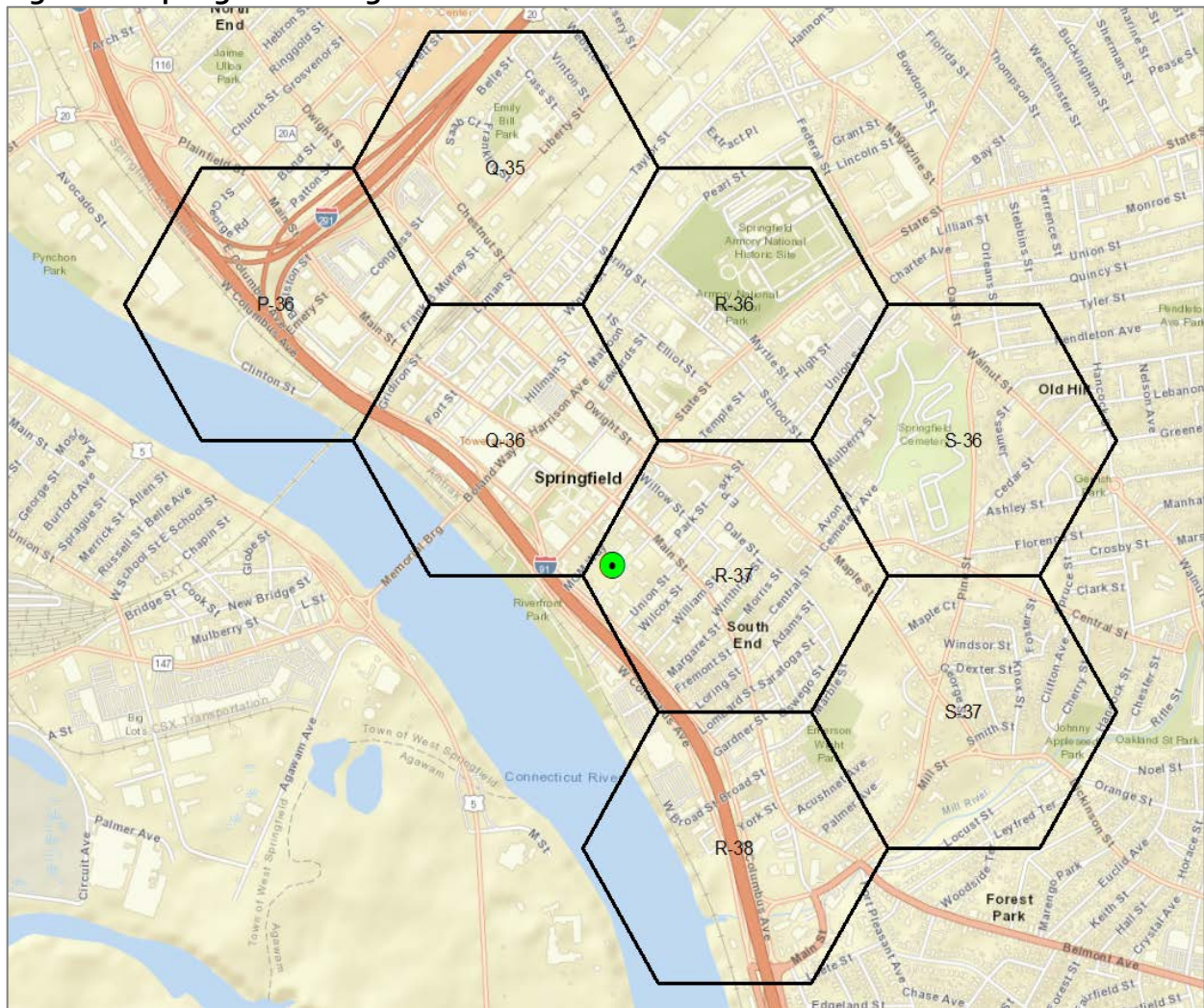
Table 8: 2022 offenses, actual to expected values, area adjacent to MGM Springfield

Offense	Yearly Avg.	Slope	2020	2021	Expected 2022	Actual 2022	2022 SR	2022 CCI
Murder	3.5	0	6	3	4	6	0.96	0.71
Kidnapping	10.8	0	6	15	12	11	-0.31	-0.19
Sexual Assault	31.7	-2	21	15	24	9	-1.83	-1.94
Robbery	126.4	-7	821	01	93	91	-0.12	-1.91
Aggravated Assault	229.9	-1	242	251	225	213	-0.72	-3.99
Simple Assault	650.3	-11	587	600	596	589	-0.19	-2.05
Threats	337.1	-8	293	340	298	281	-0.67	-3.72
Arson	6.5	0	5	8	5	6	0.40	-1.03
Extortion	1.9	0	4	3	5	1	-2.38	-5.60
Burglary	215.7	-28	125	115	67	141	2.54	-0.54
Theft from Persons	11.2	0	12	3	10	3	-1.04	-2.00
Purse-Snatching	5.8	1	6	18	9	12	0.68	-0.34
Shoplifting	37.5	5	58	48	66	46	-2.15	-2.53
Theft from Building	141.7	-4	113	113	117	154	0.91	-2.15
Theft from Machine	3.3	0	0	0	5	0	-0.88	-1.66
Theft from Vehicle	219.0	-9	218	173	168	235	1.88	0.11
Theft of MV Parts	58.5	13	77	152	124	106	-0.71	-5.19
Auto Theft	121.6	-3	108	133	105	109	0.21	-0.94
Forgery	27.7	-1	16	20	21	20	-0.14	-4.32
Fraud	46.5	0	43	43	47	67	3.14	5.70
Credit Card Fraud	27.6	5	50	32	52	35	-1.87	-1.36
Impersonation	49.4	-6	26	27	19	29	1.01	2.20
Identity Theft	3.9	1	7	7	11	6	-1.25	0.01
Employee Theft	5.6	0	3	3	5	4	-0.34	2.76
Stolen Property	33.1	1	40	34	40	39	-0.16	-3.29
Vandalism	419.3	-10	354	426	365	430	1.90	-0.49
Drugs	178.6	-5	138	105	162	92	-1.55	-0.22
Statutory Rape	1.9	0	3	0	1	2	0.77	0.37
Pornography	2.9	0	2	5	5	1	-2.00	-2.25
Gambling Offenses	2.9	1	3	10	8	9	0.43	0.86
Prostitution	27.5	-5	0	10	1	6	0.37	-0.56
Weapon Offenses	107.5	9	153	138	147	192	3.00	-1.86
All Violent Crime	**1389.7**	**-28**	**1237**	**1325**	**1253**	**1200**	**-0.87**	**-4.79**
All Vehicle Crime	**399.1**	**1**	**403**	**458**	**397**	**450**	**1.06**	**-1.27**
All Vice	**346.8**	**-1**	**316**	**289**	**342**	**330**	**-0.30**	**0.66**

Table 8 shows the calculated values for the areas adjacent to the casino. The majority of crime values are below expected values, suggesting that crime in the CBD is generally trending in the right direction - that is, decreasing. The only crimes in the area significantly higher than their expected values were burglary, thefts from vehicles, fraud, and weapons offenses, and of

these, only fraud remained high compared to what was happening in the rest of the state. We would note that violent crime, including robbery, has continued its downward trend in the area despite the theoretically increased chance of victimization provided by large influx of visitors. We analyze a few of the more notable increases below.

Fraud

Fraud—specifically the fraud code that includes "swindles" and "con games"—was the only crime in the immediate MGM area to show both an unexpectedly high value and a value out of alignment with what the rest of the state experienced during the same period. Unfortunately, it is a complex crime, often exhibiting labyrinthine plots, and thus difficult to analyze with the limited data that we collected. What we can tell from this data is that:

- Most of the increase is in hexagons R-36, R-37, and R-38. The hex containing MGM (R-37) had 27% of the incidents.

- Residences accounted for 30% of the incidents in 2022. A number of types of fraud can occur at residences, including utility imposter scams and door-to-door sales scams, but in our experience, when an incident of fraud is coded as happening at a residence, it is usually an online fraud for which that resident was a victim.

- There were 7 incidents reported at an auto rental service on East Columbus Avenue (Grid R-38). This business opened in 2018, possibly in anticipation of the extra visitors occasioned by MGM. The nature of these fraud incidents is unknown, but listed suspects are all area residents.

- Seven incidents in 2022 were reported at MGM itself. Unfortunately, the data cannot provide the nature of the offenses nor why they were reported to the Springfield Police and not the GEU. There were 14 frauds reported to Springfield Police at the casino in 2019. Other years have shown between 2 and 3.

Further information about this trend will have to come from the Springfield PD.

Burglary

The crime of burglary has shown dramatic decreases in both Springfield and Massachusetts at large over the last decade (Figure 29). The Massachusetts State Crime Reporting Unit shows that this crime fell an astonishing 68% in the state between 2012 (29,627) and 2021 (9,610). Last year was the first to reverse this trend, with a slight increase of 5% between 2021 and 2022 (10,110). These figures mirror our statewide comparison dataset, which shows a 71% drop between 2012 and 2021 and 5% increase between 2021 and 2022.

Springfield as a whole benefited from this state trend. From 2012 (2,497) through 2022 (575), the city has shown a decrease in the crime every single year. Citizens in 2022 had 77% fewer burglaries than a decade prior.

Figure 29: Burglary in Springfield
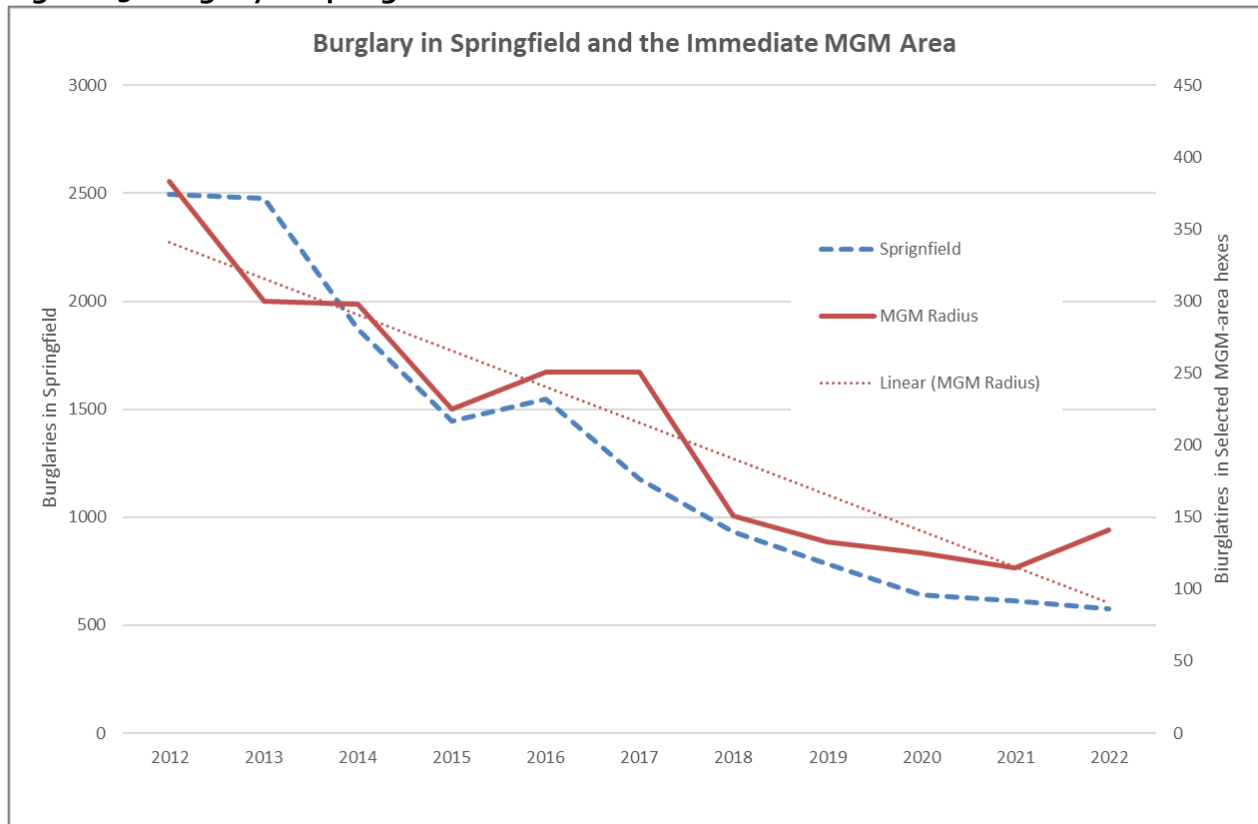
Figure 29 shows why the SR value is high for burglary in the immediate MGM area: the region had been showing a dramatic yearly decrease that predicted a very low 2022 value. Instead, the crime reversed direction slightly and ended with a value that was still low compared to historical averages. While this increase was not consistent with what happened in the city as a whole during the same year, it was consistent with what happened in the rest of Massachusetts (as reflected in the CCI). That the crime continued its decreasing trend in 2018, 2019, 2020, and 2021 suggests that the casino is not a contributing factor.

Thefts from Vehicles

Thefts from vehicles, sometimes called "auto burglaries," have also been trending down in the MGM area for the past decade, though not as sharply or consistently as burglaries. Figure 30 illustrates this downward trend.

Figure 30: Trend Line for Thefts from Vehicles in the MGM Area
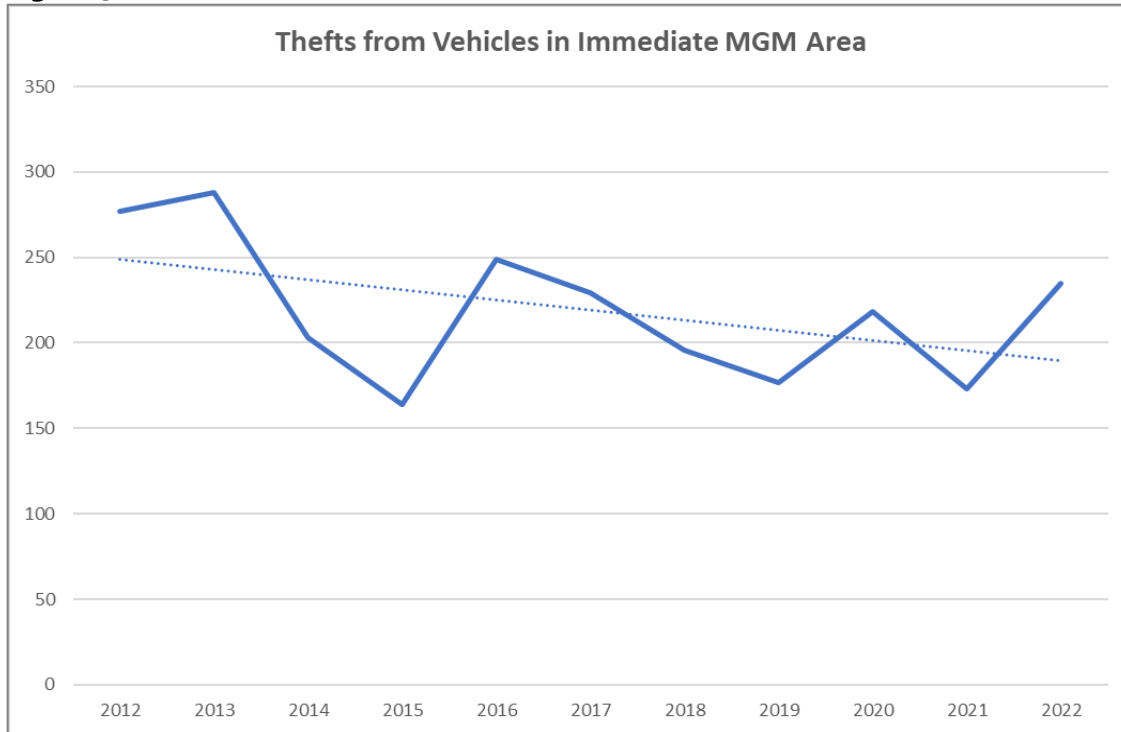
The increase in 2022 was well above the expected value, even accounting for the typical fluctuations this crime category experiences, but that increase was blunted by the fact that Massachusetts as a whole experienced a similar reversal of this trend. Nonetheless, it is worth analyzing and keeping an eye on this particular crime. It is the very sort of crime that most models predict would increase after the opening of a casino, if only because of extra vehicular traffic in the area.

Our analysis shows:

- Incidents occurring on the street (as opposed to parking lots or garages) account for 65% of the 2022 total (excluding "unknown" values) and most of the 2022 increase.
- The crime is heaviest on main commercial streets in the area, though (unexpectedly) not as much on Main Street. Top streets are Chestnut, Byers, State, Elliot, and Mulberry.
- The top single location, with 7 incidents in 2022, is the Hampton Inn at 851 East Columbus Avenue. This location has been open since 2014 but has likely seen an increase in activity since the opening of MGM.
- Most of the incidents in this area occurred during overnight hours.

Figure 31: Graduated Symbols for Thefts from Vehicle in MGM Area
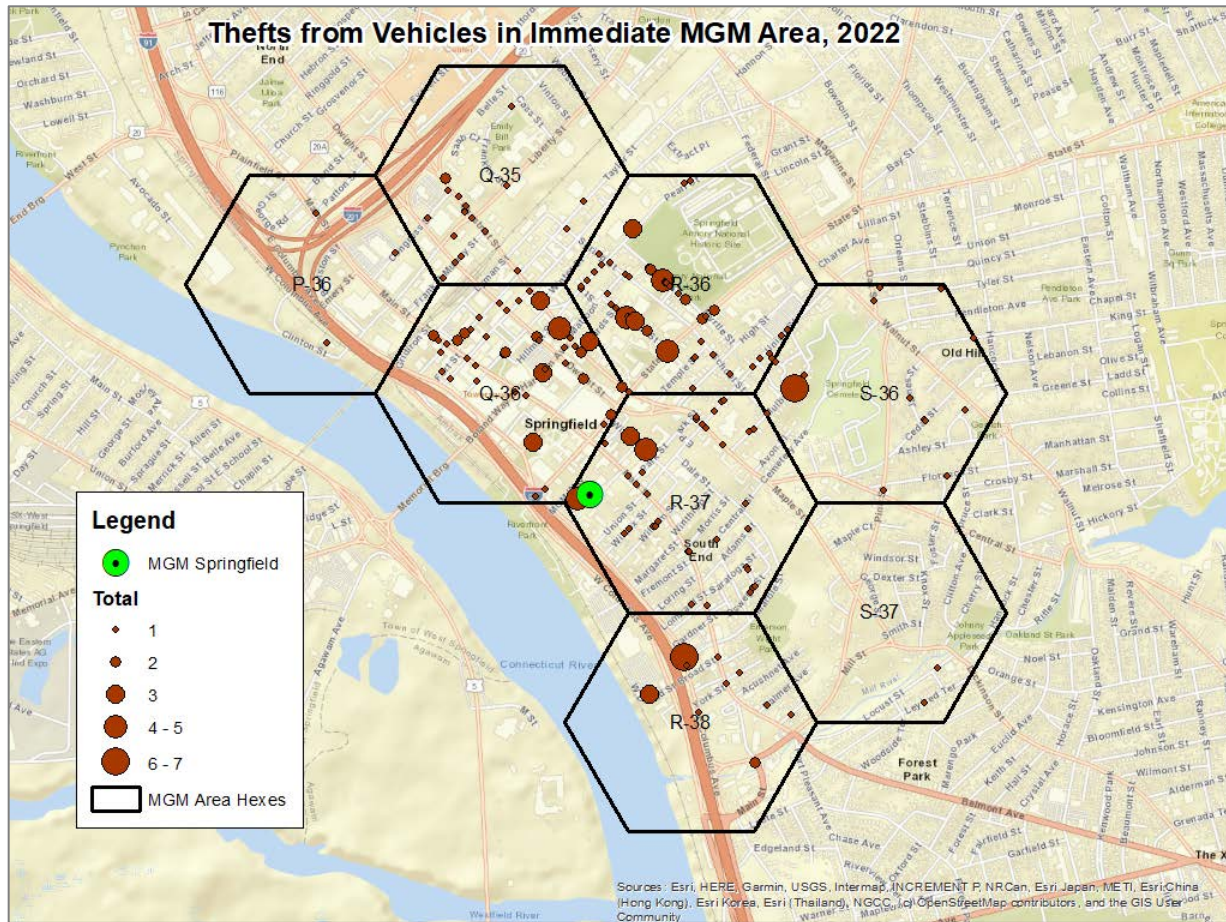
Figure 31 shows the specific locations where Thefts from Vehicle are predominant in relationship to the MGM casino. There are a number of individual addresses in the MGM radius that saw large increases in crime after MGM opened, in some cases because they did not exist before MGM.

Table 9: Total crime counts at specific businesses in MGM radius

Location	2012-2018 Avg.	2019-2022 Avg.	2022
MGM Springfield, 1 MGM Way[34]	17	137	148
Union Station, 55 Frank B. Murray St	16	71	55
CVS, 991 Main St	0	33	52
Convenience Plus, 67 Locust St	5	24	28
Pride Station, 1211 East Columbus Ave	10	26	32
Hampton Inn, 851 East Columbus Ave	5	17	19
Holiday Inn Express, 145 State St	1	13	10
Hilton Garden Inn, 765 East Columbus Ave	3	14	12

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[34] Springfield Police Department reports only

These locations appear to be impacted by the increase of MGM visitors to the area. Although we cannot tie specific crimes at these locations to known MGM visitors, it is logical that the extra traffic brought by MGM is directly linked to increases in the crimes at these locations.

Drunk driving analysis

MGM Springfield has several policies and practices in place to prevent patrons from becoming intoxicated and particularly from driving away while intoxicated. However, the size of the facility, the number of entrances and exits, and the difficulty in fully monitoring any individual's drinking activity is not "foolproof" and individuals inevitably leave the casino intoxicated. This section of the report analyzes drunk driving data to ascertain the impact of alcohol consumed at the casino.

There are several available indicators that we can study to determine whether MGM has led to an increase in drunk driving in the region, some better than others. Each available dataset is reviewed below.

<u>Drunk driving arrests by jurisdiction</u>

Drunk driving has decreased in the region since the year after the casino opened. Although the cumulative number of drunk driving arrests increased in the year immediately following MGM's opening (2019), the figure fell to below the pre-MGM average in 2020 and continued to fall in 2021 and 2022. Only Chicopee has sustained a post-MGM annual total consistently higher than the pre-MGM annual total, more than doubling its enforcement in the 00:00–04:00 time block.

Table 10: Arrests and summonses for drunk driving

Agency	2012–2018 Avg	2019	2020	2021	2022	2019–2022 Avg	Change
Springfield	57.0	54	49	48	66	54.3	-6%
Agawam	34.0	53	25	24	29	32.8	+5%
Chicopee	50.3	75	71	79	92	79.3	+70%
East Longmeadow	26.1	16	4	11	5	9.0	-67%
Holyoke	42.3	57	32	23	12	31	-23%
Longmeadow	20.1	12	16	16	18	15..5	-27%
Northampton	117.4	51	63	63	82	64.8	-49%
West Springfield	26.5	41	27	23	20	27.8	+14%
State Police*	313.1	406	356	268	207	309.3	+3%
Total	**686.9**	**765**	**643**	**555**	**531**	**623.5**	**-8%**

*MGM Springfield-area roadways only

<u>Crashes that involve an arrest or summons for drunk driving</u>

A better set of statistics involves merging the original call-for-service with the offense dataset to find offenses of drunk driving that originated as calls-for-service for traffic collisions. This should capture most of the relevant incidents, missing only cases where the determination of drunk driving happened well after the original call, or when the original call for some reason

was not coded as a collision. Table 11 shows the breakdown of calls for each of the jurisdictions.

Table 11: Calls for service for traffic collisions with a later offense for drunk driving

Agency	2012–2018 Avg	2019	2020	2021	2022	2019–2022 Avg	Change
Springfield	19.1	32	28	29	48	34.3	+79%
Agawam	2.1	1	1	0	0	0.5	-77%
Chicopee	27.6	35	32	41	41	37.3	+35%
East Longmeadow	9.0	5	0	5	2	3.0	-67%
Holyoke	22.3	28	11	9	7	1.38	-38%
Longmeadow	6.0	2	5	6	6	4.8	-21%
Northampton	22.0	9	15	18	20	15.5	-30%
West Springfield	13.3	19	14	13	11	14.25	+7%
State Police*	49.0	59	80	71	44	63.5	+30%
Total	**170.4**	**190**	**186**	**192**	**179**	**186.8**	**+10%**

*MGM Springfield-area roadways only

Traffic Collisions Resulting in a Drunk Driving Charge

Figure 32 on the next page shows traffic collisions in the region between 2019-2022. The results are inconsistent among agencies. Most still show a decrease in activity between the two periods, but the agencies with the highest volume of alcohol-involved crashes—Springfield, Chicopee, and the State Police—all showed large increases. The region as a whole increased by 10%, or about 17 drunk driving crashes per year. A map of such incidents shows a concentration on major travel routes to and from MGM, suggesting a potential casino influence, but these routes are admittedly indistinguishable from predominant travel patterns in the area irrespective of the casino.

Figure 32: Traffic Collisions in the Region

Traffic Collisions Resulting in a Drunk Driving Charge 2019-2022

Legend

- ⦿ MGM Springfield
- ⬟ State Police Incidents
- ⬢ Local Police Incidents
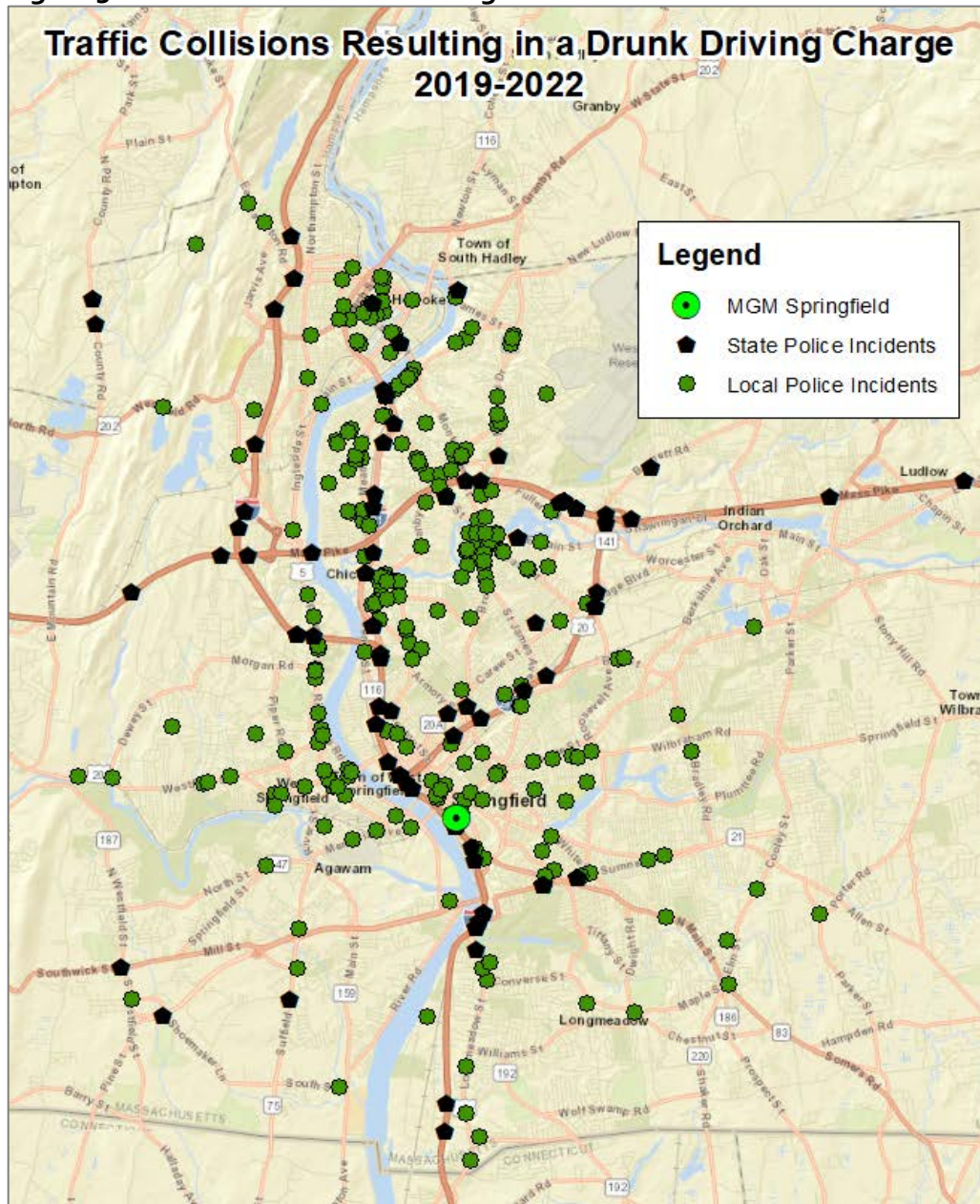
<u>"Last Drink" Locations from adjudication</u>

Massachusetts General Law Chapter 90, Section 24J requires courts to collect from individuals adjudicated guilty (whether by trial or plea) of OUI, "whether he was served alcohol prior to his violation of said section at an establishment licensed to serve alcohol on the premises and the name and location of said establishment." Court clerks send such "last drink" reports to the Alcohol Beverage Control Commission (ABCC). These reports have long been used to

prioritize certain bars for additional training and enforcement. They provide direct evidence of at least some influence of certain facilities on drunk driving.

Upon request, the ABCC provided spreadsheets for "last drink" adjudications from January 2016 to December 2022. The data includes 10,456 adjudication records, but only about 9,297 offer an identifiable location, and of those, 992 list private residences, leaving around 8,305 identifiable licensed locations.

As last drink data is collected only from those who plead guilty or are found guilty at trial, the records represent only about 17% of the roughly 50,000 people charged with OUI in Massachusetts during the coverage period. These, in turn, represent only a small percentage of the actual number of impaired drivers on the road during this period. Table 12 shows all three Massachusetts casinos appear within the "Last Drink" data.

Table 12: "Last Drink" reports from each casino by year of adjudication

Casino	2016	2017	2018	2019	2020	2021	2022
Plainridge Park	3	8	3	4	1	2	7
MGM Springfield			4	8	6	2	7
Encore Boston Harbor				1	7	8	10

Overall, MGM was reported as the place of last drink for 27 drunk drivers since its opening in 2018. The full year after opening (2019) is so far the highest, but it is nearly equaled by 2022.

Data from the Massachusetts Executive Office of Public Safety and Security indicates that 28,201 people were charged with drunk driving (OUI) between 2019 and 2022. There are 4,330 "last drink" adjudication records during this period, representing 15.35% of this total. If we assume that the number of adjudication records identifying MGM as the place of last drink is identical in proportion to the rest of the dataset, that suggests that about 150 drunk drivers were arrested between 2019 and 2022 after leaving MGM Springfield.

There is no easy way to translate this arrest data into an estimate for the number of drunk driving trips from the casino. The risk of arrest for drunk driving has not been studied in any published research for the last 10 years or in any Massachusetts-specific research during any time period that we can find. A 2011 study in New York state estimated the number of arrests per incident of drunk driving was 1 in 482 (0.21%).[35] If this estimate holds true in Massachusetts a decade later, it suggests around 72,300 drunk driving trips from MGM over the four-year period, but more specific Massachusetts research is needed to refine this estimate.

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[35] Dowling, A., MacDonald, R., & Carpenter, K. H. (2011). Frequency of alcohol-impaired driving in New York State. *Traffic Injury Prevention*, 12(2), 120–127.

Conclusions and Future Direction

The aim of this report was multifaceted. It provides researchers an opportunity to become familiar with the data and the geography. It provides a drill down on crime around MGM Springfield beginning with an analysis of the entire region that included eight (8) jurisdictions surrounding the City of Springfield. The analysis examined crime over five distinct periods: (1) pre casino opening, (2) initial casino opening, (3) during covid full closure, (4) during restrictive reopening post closure, and (5) fully reopening the casino. Because the findings during the COVID-19 closures were the same or similar to Encore, this research effort moved past COVID concerns and focused on crime within hotspots in the MGM area. The analysis drilled down into various areas, (1) region, (2) city-by-city and (3) looked at ten distinct hotspots within the Springfield downtown area; and compared it to two other distinct hexagons outside of Springfield. It also conducted a micro-analysis of specific crime trends for several crime types and offered insights into the data and those findings. The onsite assessment provided qualitative observations that shed light on environmental conditions that lead to crime.

- An important finding is that there was a significant increase in crime before the MGM Springfield Casino reopened after the mandated COVID-19 closure. Figure 7 (p.42) shows this chronological ordering, which suggests that the casino is not a primary cause of crime, but that other social, economic, or psychological factors are likely playing a role in changes in crime patterns. For example, it is possible the strain of COVID-19 created an environment where motivated offenders sought relief from stress and/or economic hardship that led them to criminality, but a closed casino cannot be a factor.
- Crime in the MGM-Springfield area consistently follows a summer seasonal pattern of increase in warmer months. This is most likely not a surprise to police departments in the region but should serve as a reoccurring pattern that could guide proactive strategies in the summertime to address this regular increase in crime.
- Overall crime in the region has been steadily declining over the past 10 years with a slight uptick in 2022. Figure 6 (p.41) shows a leveling off in crime along the expected downward trend.
- The region is impacted most by crime in the City of Springfield, ranging between 33% and 62% of specific crime categories in the area. Overall, Springfield accounts for 62% the crime in the region.
- Researchers conducted an onsite qualitative assessment of the hotspots which presented several explanations for why crime perpetuates within these respective areas.
- Social Disorganization Theory suggests that poverty, heterogeneity, and youthful offenders drive most crime in urban areas and proliferates in concentric zones. Springfield Central City and the Central Business District appear to adhere to this conceptualization, and when different crime types were investigated, these findings remained consistent.

- Certainly crime series manifest themselves over time and police departments should regularly monitor temporal and spatial patterns as they evolve. The micro-analysis illustrated how distinct crimes occur and illustrates how robust crime evolves in an area.

The research team accomplished the objectives of this study and is now in a better position to study crime in and around the casino and can use different spatial and temporal techniques to study crime and disorder in the future. While this research found that crime has categorically gone down overall, pockets of crime still occur and consistent hotspots present themselves. It does suggest to us that motivated offenders will find other means and targets when strain or opportunities present themselves. More research is needed that focuses on offending, victimology, and hotspots.

Benchmarks have been established for which to compare crime in the future using new and innovative research methods to study crime. They include learning and applying Poisson regression, Seasonal-Trend decomposition procedure based on Loess (STL), spatial point pattern test (SPPT), and other time series and trend analysis techniques in the future. Risk Terrain Modeling appears to be a promising technique to conduct micro-analysis of hexagon hotspots towards identifying crime drivers or contributors that will help agencies better understand risk and protective factors found within their communities. The new Environmental Systems Research Institute (ESRI) technique called *Aggregate Clustering* provided a useful robust tool to monitor and pinpoint hotspots within hotspots. Future research goals remain the same:

- An expansive analysis of trends by working with the agencies to look at the full reports, including narratives.
- An analysis of changes in the MGM Springfield area compared to control areas and the rest of the state. This approach was utilized in the report for the first time.
- A comparative analysis of traffic collisions in the Springfield area versus control areas. This probably will not be possible until a public statewide crash dataset is available.
- A comparison of MGM Springfield with other casinos, normalized by the number of annual visitors each facility receives. We remain committed to identifying casinos who will share their data so we can compare them on a national basis.

The Massachusetts Gaming Commission has received several questions from partners and stakeholders concerning the possible growth of human trafficking, particularly sex trafficking in the area. Police statistics are a poor measure of "hidden" crimes like human trafficking, and thus we must look to more creative ways to blend information and intelligence from a variety of sources. To this end, the MGC will be commissioning a meeting of experts to discuss the issue, and to hopefully create an analytical process that will allow us to report better on this potential phenomenon in future reports. One recommendation to agencies in the casino regions is to have officers begin asking victims of crime if they were visiting the casino during the timeframe of the event. Linking victims of crime who have a connection to the casino would enhance the nexus between crime and the casino, regardless if the victims are the result of human trafficking or other connections, such as patrons or employees.

This research report lends itself to critically thinking about crime in its temporal and spatial context, which in turn provides actionable intelligence for agencies interested in developing robust solutions to their crime problems. Crime Prevention By Environmental Design (CPTED), Opportunity Theory and Focused Deterrence are just a few examples of best practice coming out of the contemporary police literature and from police organizations like the Police Foundation and the International Association of Chiefs of Police. The International Association of Crime Analysts is dedicated to improving crime analysis techniques and best practice.

As offenders continue to look for opportunities whenever and wherever they can, know that motivated offenders are resourceful offenders, they study victims and targets, and possess ingenuity, no different than other entrepreneurs. Police officers act as guardians to prevent and mitigate crime in our communities. The Massachusetts Gaming Commission, by funding reports like this one and the applied research it offers, equips them with the information they need to do so.

The spatial analysis of crime in the MGM Springfield region appears to be best explained by Social Disorganization Theory, concentric zones, and distance decay. The crime patterns evaluated in the report demonstrated again and again that crime in this region diminishes outward from Central City (Springfield) and diminishes the further one gets from downtown.

Social disorganization, or the breakdown of social institutions and community cohesion, is central to SDT. Specifically, according to SDT, this breakdown manifests as a weakening of the traditional social bonds that connect individuals and families to key institutions within a neighborhood, such as schools, churches, and local government. As these social bonds deteriorate, the community's capacity to address common issues, including crime and delinquency, weakens as well. This weakening of "collective efficacy" means that residents have a reduced ability to enforce shared norms and values, as well as to exercise informal social control. Consequently, within socially disorganized areas, crime is more likely to thrive due to the absence of collective efforts to prevent and address it. Social Disorganization Theory thus emphasizes the role of community structure and the breakdown of social institutions in shaping crime patterns.

Improved economic conditions, employment opportunities that reduce poverty and unemployment in a region, can improve collective efficacy, and, as a result, lower crime. The City of Springfield has begun to implement an urban development plan that includes the casino in Central City, and crime has continued to decline over the past decade. The tax revenue has enabled Springfield to bolster police services (i.e., formal social control), and bring several community events and concerts into the central business district, strengthening social bonds and expanding other employment opportunities. By addressing poverty, strengthening social bonds, and improving collective efficacy, it appears that Social Disorganization Theory is positively on display in Springfield, at least as it pertains to crime rates.

Today we have a little better understanding about how crime behaves; in fact, how criminals behave and how, leaning on existing theories of crime, micro and macro in nature, crime can be predicted and public safety organization can develop enforcement and crime prevention strategies to address it. We have laid the groundwork for better understanding the third

element of the crime triangle, time/place, as we create a knowledge base around crime and place—casinos more specifically. Understanding crime in relationship to population density, poverty, and the risks that urban living presents is our future goal.

Final Observations

Our analysis is that the MGM region as a whole, the city of Springfield, and the area immediately around the casino have not witnessed any large-scale, sustained increases in reported crime that can be traced to the casino itself. Most crimes in the area were already on a downward trend when MGM opened, and they continued that downward trend through 2022. Exceptions to this statement in 2022 mostly reflect increases in crime that were happening elsewhere in Massachusetts during the same period. To the extent that any of the variables that we would expect to cause more crime are present, they seem to be balanced by those factors that lead to fewer crimes.

Our conclusion should not be read to mean that the casino has caused *no* crime in the area, just that its influences seem to be bounded by location, situation, and time frame. These "microtrends" may include increases in crime at specific businesses, brief patterns, and gambling-motivated offenders whose crimes are not voluminous enough to affect overall area trends.

Below is a brief discussion of the role of daytime and event population, as well as a promising new approach to better understand crime within its geographic context. Risk Terrain Modeling offers the police and researchers, alike, a mechanism to put crime under the social microscope.

Daytime population – Special Events Attendance

We also want to look at better methods of normalizing the data. Crime rates historically use residential population or census data, but urban areas and locations that have special events or larger employers (referred to as daytime population and special event populations) might be more robust or at least offer other proxies for understating crime and place. Other venues like bars, taverns, dance clubs, colleges, transportation hubs or subway or light rail stops, malls and shopping centers to name a few – draw people who are, and their cars that are, potential targets. Social disorganization theory suggests that underground economies for stolen goods, drugs, and prostitution proliferate in neighborhoods of poverty for economic reasons. Events like an NBA playoff or a Superbowl game draws larger crowds, many of them big spenders and gamblers, and it has been reported that these venues attract prostitution and human trafficking, all things that we should be on the lookout as we go forward. Future research will employ a relatively new research model called Risk Terrain Modeling (RTM). The authors and designers of RTM have been contacted to discuss a plan for using RTM to study crime and place in the future, particularly the threats and risks at and around casinos. If you are interested in learning more about this technique, see the articles or book listed below. Risk Terrain Modeling offers a robust method to compare and contrast crime hotspots in the future.

Risk Terrain Modeling

Kennedy, L. W., Caplan, J. M., Piza, E. L. & Buccine Schraeder, H. (2016). Vulnerability and Exposure to Crime: Applying Risk Terrain Modeling to the Study of Assault in Chicago. Applied Spatial Analysis and Policy. 9(4), 529-54.

Kennedy, L. W., Caplan, J. M. (2019). OPERATION SAFE SURROUNDINGS (OPSS): THE EVIDENCE-BASED VIOLENCE PREVENTION STRATEGY. *Issues in Spatial Analysis Series*, Vol. 2 Edited by J. M. Caplan, and L. W. Kennedy.

Kennedy, L. W., Caplan, J. M. (2016). Risk Terrain Modeling: Crime Prediction and Risk Reduction. United States: University of California Press.

> Risk Terrain Modeling is an approach to risk assessment in which separate map layers representing the influence and intensity of a crime risk factor at every place throughout a geography is created in a GIS. Then all map layers are combined to produce a composite "risk terrain" map with values that account for all risk factors at every place throughout the geography. RTM builds upon principles of hotspot mapping, environmental criminology, and problem-

oriented policing to produce maps that show where conditions are ideal or conducive for crimes to occur in the future given existing environmental contexts. It offers a new and statistically valid way to articulate and communicate crime-prone areas at the micro level according to the special influence of criminogenic features.

By comparing both the frequency of crime and calls-for-service within high volume areas to crime contributors or contributing factors, what RTM refers to as risk and protective factors, social and geographic elements can be investigated to measure the risk of crime and demonstrate viable correlations between the types of establishment or venues within high crime areas. RTM can be used to assess high and low hexagon clusters to determine what correlates are found for higher risk as well as protective elements. By using RTM, insights can be offered to local law enforcement agencies and communities when considering crime reduction strategies. In this way, a broader understanding of crime and place may offer a more robust picture. To date, no research or theory has attempted this approach to study casinos.

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Appendix

Appendix A - Acronyms and abbreviations

CAD	Computer-aided Dispatch (system)	A police database that holds information about police dispatches to calls for service, including incidents discovered by police officers. Some but not all the incidents reported in CAD are crimes and have longer records in the RMS.
CFS	Calls for Service	Typically, 911 calls for help and other non-emergency calls to the police for assistance.
IBR	Incident-based reporting	See NIBRS.
MGC	Massachusetts Gaming Commission	The commonwealth agency charged with overseeing and regulating gaming in Massachusetts
FBI	Federal Bureau of Investigation	National investigative agency, part of the U.S. Department of Justice, in charge of collecting national crime statistics.
IACA	International Association of Crime Analysts	A global nonprofit professional association that provides training, literature, and networking to individuals who analyze crime data.
MACA	Massachusetts Association of Crime Analysts	A nonprofit professional association that provides training, literature, and networking to individuals who analyze crime data in New England.
NIBRS	National Incident-based Reporting System	FBI program for data collection that supersedes UCR. Collects more specific data about a wider variety of crimes. With only a few exceptions, all Massachusetts agencies report to NIBRS and all Massachusetts RMS vendors have implemented NIBRS coding standards.
ODBC	Open Database Connectivity	A technology developed by Microsoft that allows any application that uses a database to connect to any database source. The primary mechanism by which we can extract data from police CAD and RMS databases.
RMS	Records Management System	A police data system that stores information about crimes and offenders. See also CAD.
SEIGMA	Social and Economic Impacts of Gaming in Massachusetts	A multi-year research project hosted by the University of Massachusetts Amherst School of Public and Health Sciences. The SEIGMA project has a broader mandate for its study than just crime.
UCR	Uniform Crime Reporting (program)	National program for the reporting of crime statistics to the FBI. Captures only summary data about a limited number of crime types. Contrast with NIBRS.

Appendix B - Call for service definitions

Calls for service include both criminal and noncriminal police incidents and activities. In the case of criminal activities, such incidents receive a longer, more detailed report in the police records management system, and it so it makes more sense to analyze them using the crime categories above than in their original call-for-service form. Thus, the only incident types we have selected for analysis in this report are noncriminal. Definitions of those types appear below. Because the police officer does not usually write a full report for calls for service, the dataset available for analysis is more limited.

Administrative: A wide variety of call types that have to do with the administration of a police department, such as delivery of documents to businesses or other government facilities, attendance at meetings, vehicle maintenance, or even meal breaks. Agencies use their call-for-service systems to document such activities so that they can determine what a particular officer or unit was doing at a particular time, although the incidents are not truly "calls for service." Practices differ significantly between police agencies as to what is reported under this category, and it is generally not useful for analysis.

Alarm: A burglar, panic, or medical alarm that required a response but (probably) turned out to be false or would have a different final code.

Animal complaint: Calls involving sick, dangerous, or wild animals, animals in danger (e.g., left in a hot or cold car), or loose or noisy pets.
Assist other agency: A call type that involves rendering aid to a neighboring police or other government agency for any number of purposes, including serious crimes, fire and medical issues, and traffic issues.

Crime enforcement: Any number of pro-active police activities meant to deter crime, generally taking the form of a "directed patrol" to a particular location during a peak time for criminal activity (based either on citizen complaints or internal analysis). Though not a technical "call for service," such incidents are recorded in the CAD database to document the officer's activity.

Disabled vehicle: A call for service for a vehicle suffering physical or mechanical trouble, usually broken down in an active roadway.

Disturbance: Any of a variety of types of disorderly conduct, disputes, fights, and excessive noise.

Domestic dispute: A dispute between family members, spouses, or intimate partners that has not risen to the level of physical violence.

General service: Minor calls for service that involve rendering aid to residents and visitors for a variety of issues such as giving directions, installing car seats, dealing with lockouts, and providing physical aid.

Gunshots: Reports of gunshots fired, whether phoned in by a resident or received from automatic detection services.

Hunting: Reports of hunters hunting off-season, in protected areas, with illegal gear, or in an unsafe manner.

Lost property: Calls for service involving lost personal property such as wallets and mobile phones. If there is any indication of theft, these incidents are typically reported under the appropriate crime category.

Medical aid: All calls for medical aids except unattended deaths and overdoses. Police responses only are included in the figures in this report.

Missing person: a runaway or other missing person.
Prisoner transport: documentation of a police agency transporting an arrested person from one facility to another.

Psychological issue: Calls for service involving individuals with mental health issues.

Suspicious activity: Any suspicious person, vehicle, or other activity, whether identified by an officer or citizen.

Traffic collision: A collision involving at least one motor vehicle.

Traffic complaint: Complaint about reckless driving, illegal or unsafe parking, or other traffic issues.

Trespassing: Trespassing on private or public property.

Vehicle stop: An officer pulls over a vehicle for a moving or equipment violation.

Warrant service: a call type that documents the service, or attempted service, of an arrest warrant or search warrant. The category is entirely police-directed.

Youth disorder: Disorderly incidents involving youths congregating, skateboarding, making noise, and so forth.

Appendix C - Offense types by associated crime category

Offense	Category	Offense	Category
Aggravated Assault	Violent Crime	Liquor Law Violations	Drug/Alcohol Crime
All Other	Other Crime	Murder	Violent Crime
Arson	Property Crime	Other Thefts	Property Crime
Auto Theft	Property Crime	Peeping Tom	Other Crime
Bad Checks	Property Crime	Pornography	Societal Crime
Burglary	Property Crime	Prostitution	Societal Crime
Credit Card Fraud	Property Crime	Robbery	Violent Crime
Disorderly	Societal Crime	Runaway	Other Crime
Drug Equipment Offense	Drug/Alcohol Crime	Sexual Assault	Violent Crime
Drug Offense	Drug/Alcohol Crime	Shoplifting	Property Crime
Drunk Driving	Drug/Alcohol Crime	Simple Assault	Violent Crime
Drunkenness	Drug/Alcohol Crime	Statutory Rape	Other Crime
Employee Theft	Property Crime	Stolen Property Offense	Property Crime
Extortion	Property Crime	Thefts from Buildings	Property Crime
Family Offenses	Other Crime	Thefts from Vehicles	Property Crime
Forgery	Property Crime	Thefts of Vehicle Parts	Property Crime
Fraud/Con Games	Property Crime	Threats	Violent Crime
Gambling	Societal Crime	Trespassing	Other Crime
Identity Theft	Property Crime	Vandalism	Property Crime
Kidnapping	Violent Crime	Weapon Offenses	Societal Crime

Appendix D - Example of ACS Population Summary for Hexagons

ACS Population Summary

R-37
Area: 0.25 square miles

Prepared by Esri

	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
TOTALS				
Total Population	3,158		561	▮▮▮
Total Households	1,392		181	▮▮▮
Total Housing Units	1,521		189	▮▮▮
POPULATION AGE 3+ YEARS BY SCHOOL ENROLLMENT				
Total	3,061	100.0%	548	▮▮▮
Enrolled in school	787	25.7%	213	▮▮
Enrolled in nursery school, preschool	96	3.1%	147	▮
Public school	96	3.1%	147	▮
Private school	0	0.0%	0	
Enrolled in kindergarten	55	1.8%	49	▮
Public school	55	1.8%	49	▮
Private school	0	0.0%	0	
Enrolled in grade 1 to grade 4	261	8.5%	118	▮▮
Public school	260	8.5%	118	▮▮
Private school	1	0.0%	7	▮
Enrolled in grade 5 to grade 8	140	4.6%	72	▮▮
Public school	139	4.5%	72	▮▮
Private school	0	0.0%	2	
Enrolled in grade 9 to grade 12	80	2.6%	54	▮
Public school	80	2.6%	54	▮
Private school	1	0.0%	3	▮
Enrolled in college undergraduate years	91	3.0%	61	▮
Public school	64	2.1%	81	▮
Private school	27	0.9%	32	▮
Enrolled in graduate or professional school	65	2.1%	40	▮▮
Public school	0	0.0%	0	
Private school	65	2.1%	40	▮▮
Not enrolled in school	2,274	74.3%	280	▮▮▮
POPULATION AGE 65+ BY RELATIONSHIP AND HOUSEHOLD TYPE				
Total	394	100.0%	130	▮▮
Living in Households	391	99.2%	130	▮▮
Living in Family Households	218	55.3%	118	▮▮
Householder	95	24.1%	55	▮▮
Spouse	112	28.4%	77	▮
Parent	11	2.8%	18	▮
Parent-in-law	0	0.0%	0	
Other Relative	1	0.3%	6	▮
Nonrelative	0	0.0%	0	
Living in Nonfamily Households	173	43.9%	59	▮▮
Householder	173	43.9%	59	▮▮
Nonrelative	0	0.0%	0	
Living in Group Quarters	3	0.8%	41	▮

Source: U.S. Census Bureau, 2017-2021 American Community Survey

Reliability: ▮▮▮ high ▮▮ medium ▮ low

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	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
HOUSEHOLDS BY TYPE AND SIZE				
Family Households	754	54.2%	163	🟧
2-Person	308	22.1%	106	🟧
3-Person	166	11.9%	71	🟧
4-Person	225	16.2%	136	🟧
5-Person	36	2.6%	62	🟥
6-Person	0	0.0%	0	
7+ Person	19	1.4%	41	🟥
Nonfamily Households	637	45.8%	120	🟩
1-Person	546	39.2%	115	🟧
2-Person	67	4.8%	39	🟧
3-Person	15	1.1%	23	🟥
4-Person	0	0.0%	0	
5-Person	0	0.0%	0	
6-Person	0	0.0%	0	
7+ Person	9	0.6%	61	🟥
HOUSEHOLDS BY PRESENCE OF PEOPLE UNDER 18 YEARS BY HOUSEHOLD TYPE				
Households with one or more people under 18 years	468	33.6%	155	🟧
Family households	459	33.0%	154	🟧
Married-couple family	172	12.4%	135	🟥
Male householder, no wife present	33	2.4%	82	🟥
Female householder, no husband present	253	18.2%	86	🟧
Nonfamily households	9	0.6%	61	🟥
Households with no people under 18 years	924	66.4%	143	🟩
Married-couple family	160	11.5%	71	🟧
Other family	136	9.8%	68	🟧
Nonfamily households	628	45.1%	120	🟩
HOUSEHOLDS BY PRESENCE OF PEOPLE 65 YEARS AND OVER, HOUSEHOLD SIZE AND HOUSEHOLD TYPE				
Households with Pop 65+	323	23.2%	88	🟧
1-Person	175	12.6%	59	🟧
2+ Person Family	147	10.6%	70	🟧
2+ Person Nonfamily	0	0.0%	0	
Households with No Pop 65+	1,069	76.8%	175	🟩
1-Person	371	26.7%	107	🟧
2+ Person Family	607	43.6%	161	🟧
2+ Person Nonfamily	91	6.5%	49	🟧
HOUSEHOLD TYPE BY RELATIVES AND NONRELATIVES FOR POPULATION IN HOUSEHOLDS				
Total	3,111	100.0%	560	🟩
In Family Households	2,339	75.2%	565	🟧
In Married-Couple Family	993	31.9%	529	🟧
Relatives	976	31.4%	529	🟧
Nonrelatives	16	0.5%	134	🟥
In Male Householder-No Spouse Present-Family	239	7.7%	241	🟥
Relatives	206	6.6%	150	🟥
Nonrelatives	33	1.1%	208	🟥
In Female Householder-No Spouse Present-Family	1,108	35.6%	314	🟧
Relatives	1,057	34.0%	298	🟧
Nonrelatives	51	1.6%	43	🟥
In Nonfamily Households	771	24.8%	169	🟧

Source: U.S. Census Bureau, 2017-2021 American Community Survey

Reliability: 🟩 high 🟧 medium 🟥 low

May 31, 2023

	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
POPULATION AGE 5+ YEARS BY LANGUAGE SPOKEN AT HOME AND ABILITY TO SPEAK ENGLISH				
Total	2,870	100.0%	424	▥
5 to 17 years				
Speak only English	258	9.0%	108	▤
Speak Spanish	230	8.0%	121	▤
Speak English "very well" or "well"	216	7.5%	116	▤
Speak English "not well"	14	0.5%	125	▮
Speak English "not at all"	0	0.0%	0	
Speak other Indo-European languages	0	0.0%	0	
Speak English "very well" or "well"	0	0.0%	0	
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
Speak Asian and Pacific Island languages	0	0.0%	0	
Speak English "very well" or "well"	0	0.0%	0	
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
Speak other languages	0	0.0%	0	
Speak English "very well" or "well"	0	0.0%	0	
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
18 to 64 years				
Speak only English	557	19.4%	147	▤
Speak Spanish	1,272	44.3%	306	▤
Speak English "very well" or "well"	724	25.2%	168	▤
Speak English "not well"	333	11.6%	133	▤
Speak English "not at all"	215	7.5%	131	▤
Speak other Indo-European languages	62	2.2%	43	▮
Speak English "very well" or "well"	62	2.2%	46	▮
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
Speak Asian and Pacific Island languages	11	0.4%	16	▮
Speak English "very well" or "well"	11	0.4%	16	▮
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
Speak other languages	86	3.0%	98	▮
Speak English "very well" or "well"	86	3.0%	98	▮
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
65 years and over				
Speak only English	117	4.1%	54	▤
Speak Spanish	275	9.6%	115	▤
Speak English "very well" or "well"	81	2.8%	72	▮
Speak English "not well"	87	3.0%	54	▤
Speak English "not at all"	107	3.7%	69	▤
Speak other Indo-European languages	2	0.1%	6	▮
Speak English "very well" or "well"	0	0.0%	5	
Speak English "not well"	1	0.0%	6	▮
Speak English "not at all"	0	0.0%	0	
Speak Asian and Pacific Island languages	0	0.0%	0	
Speak English "very well" or "well"	0	0.0%	0	
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	
Speak other languages	0	0.0%	0	
Speak English "very well" or "well"	0	0.0%	0	
Speak English "not well"	0	0.0%	0	
Speak English "not at all"	0	0.0%	0	

Source: U.S. Census Bureau, 2017-2021 American Community Survey

Reliability: ▥ high ▤ medium ▮ low

May 31, 2023

	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
WORKERS AGE 16+ YEARS BY PLACE OF WORK				
Total	924	100.0%	203	🟧
Worked in state and in county of residence	755	81.7%	187	🟧
Worked in state and outside county of residence	81	8.8%	53	🟧
Worked outside state of residence	87	9.4%	62	🟥
SEX BY CLASS OF WORKER FOR THE CIVILIAN EMPLOYED POPULATION 16 YEARS AND OVER				
Total:	924	100.0%	203	🟧
Male:	500	54.1%	155	🟧
Employee of private company	416	45.0%	150	🟧
Self-employed in own incorporated business	1	0.1%	22	🟥
Private not-for-profit wage and salary workers	47	5.1%	28	🟧
Local government workers	26	2.8%	28	🟥
State government workers	5	0.5%	9	🟥
Federal government workers	3	0.3%	26	🟥
Self-employed in own not incorporated business workers	1	0.1%	7	🟥
Unpaid family workers	0	0.0%	0	
Female:	424	45.9%	117	🟧
Employee of private company	266	28.8%	72	🟧
Self-employed in own incorporated business	0	0.0%	0	
Private not-for-profit wage and salary workers	77	8.3%	44	🟧
Local government workers	20	2.2%	21	🟥
State government workers	59	6.4%	62	🟥
Federal government workers	0	0.0%	0	
Self-employed in own not incorporated business workers	2	0.2%	4	🟥
Unpaid family workers	0	0.0%	0	
POPULATION IN HOUSEHOLDS AND PRESENCE OF A COMPUTER				
Total	3,111	100.0%	560	🟩
Population <18 in Households	775	24.9%	292	🟧
Have a Computer	766	24.6%	293	🟧
Have NO Computer	9	0.3%	14	🟥
Population 18-64 in Households	1,945	62.5%	310	🟩
Have a Computer	1,833	58.9%	306	🟩
Have NO Computer	112	3.6%	67	🟧
Population 65+ in Households	391	12.6%	130	🟧
Have a Computer	241	7.7%	105	🟧
Have NO Computer	150	4.8%	84	🟧
HOUSEHOLDS AND INTERNET SUBSCRIPTIONS				
Total	1,392	100.0%	181	🟩
With an Internet Subscription	957	68.8%	168	🟩
Dial-Up Alone	0	0.0%	0	
Broadband	595	42.7%	102	🟩
Satellite Service	38	2.7%	39	🟥
Other Service	28	2.0%	56	🟥
Internet Access with no Subscription	206	14.8%	78	🟧
With No Internet Access	229	16.5%	77	🟧

Reliability: 🟩 high 🟧 medium 🟥 low

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	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
WORKERS AGE 16+ YEARS BY MEANS OF TRANSPORTATION TO WORK				
Total	924	100.0%	203	🟧
Drove alone	557	60.3%	155	🟧
Carpooled	72	7.8%	49	🟥
Public transportation (excluding taxicab)	98	10.6%	74	🟥
Bus or trolley bus	98	10.6%	74	🟥
Light rail, streetcar or trolley	0	0.0%	0	
Subway or elevated	0	0.0%	0	
Long-distance/Commuter Train	0	0.0%	0	
Ferryboat	0	0.0%	0	
Taxicab	0	0.0%	0	
Motorcycle	0	0.0%	0	
Bicycle	0	0.0%	0	
Walked	113	12.2%	102	🟥
Other means	32	3.5%	20	🟧
Worked at home	52	5.6%	59	🟥
WORKERS AGE 16+ YEARS (WHO DID NOT WORK FROM HOME) BY TRAVEL TIME TO WORK				
Total	872	100.0%	185	🟧
Less than 5 minutes	22	2.5%	26	🟥
5 to 9 minutes	175	20.1%	126	🟥
10 to 14 minutes	140	16.1%	58	🟧
15 to 19 minutes	180	20.6%	105	🟧
20 to 24 minutes	78	8.9%	30	🟧
25 to 29 minutes	51	5.8%	30	🟧
30 to 34 minutes	109	12.5%	70	🟧
35 to 39 minutes	15	1.7%	25	🟥
40 to 44 minutes	23	2.6%	39	🟥
45 to 59 minutes	24	2.8%	25	🟥
60 to 89 minutes	29	3.3%	87	🟥
90 or more minutes	26	3.0%	24	🟥
Average Travel Time to Work (in minutes)	N/A		N/A	🟥
FEMALES AGE 20-64 YEARS BY AGE OF OWN CHILDREN AND EMPLOYMENT STATUS				
Total	898	100.0%	182	🟧
Own children under 6 years only	73	8.1%	53	🟥
In labor force	53	5.9%	50	🟥
Not in labor force	20	2.2%	17	🟥
Own children under 6 years and 6 to 17 years	109	12.1%	110	🟥
In labor force	16	1.8%	23	🟥
Not in labor force	93	10.4%	107	🟥
Own children 6 to 17 years only	106	11.8%	49	🟧
In labor force	52	5.8%	31	🟧
Not in labor force	53	5.9%	42	🟥
No own children under 18 years	610	67.9%	147	🟧
In labor force	325	36.2%	119	🟧
Not in labor force	285	31.7%	96	🟧

Reliability: 🟩 high   🟧 medium   🟥 low

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CIVILIAN NONINSTITUTIONALIZED POPULATION BY AGE & TYPES OF HEALTH INSURANCE COVERAGE	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
Total	3,145	100.0%	561	high
Under 19 years:	816	25.9%	294	medium
One Type of Health Insurance:	760	24.2%	295	medium
Employer-Based Health Ins Only	5	0.2%	6	low
Direct-Purchase Health Ins Only	8	0.3%	60	low
Medicare Coverage Only	0	0.0%	0	
Medicaid Coverage Only	747	23.8%	295	medium
TRICARE/Military Hlth Cov Only	0	0.0%	0	
VA Health Care Only	0	0.0%	0	
2+ Types of Health Insurance	56	1.8%	53	low
No Health Insurance Coverage	0	0.0%	0	
19 to 34 years:	1,096	34.8%	287	medium
One Type of Health Insurance:	811	25.8%	185	medium
Employer-Based Health Ins Only	263	8.4%	114	medium
Direct-Purchase Health Ins Only	25	0.8%	23	low
Medicare Coverage Only	0	0.0%	0	
Medicaid Coverage Only	523	16.6%	161	medium
TRICARE/Military Hlth Cov Only	0	0.0%	0	
VA Health Care Only	0	0.0%	0	
2+ Types of Health Insurance	111	3.5%	53	medium
No Health Insurance Coverage	174	5.5%	208	low
35 to 64 years:	842	26.8%	142	high
One Type of Health Insurance:	709	22.5%	120	high
Employer-Based Health Ins Only	208	6.6%	86	medium
Direct-Purchase Health Ins Only	37	1.2%	32	low
Medicare Coverage Only	2	0.1%	14	low
Medicaid Coverage Only	461	14.7%	93	medium
TRICARE/Military Hlth Cov Only	0	0.0%	0	
VA Health Care Only	0	0.0%	0	
2+ Types of Health Insurance	101	3.2%	68	low
No Health Insurance Coverage	31	1.0%	36	low
65+ years:	391	12.4%	130	medium
One Type of Health Insurance:	46	1.5%	39	low
Employer-Based Health Ins Only	0	0.0%	0	
Direct-Purchase Health Ins Only	0	0.0%	0	
Medicare Coverage Only	46	1.5%	39	low
TRICARE/Military Hlth Cov Only	0	0.0%	0	
VA Health Care Only	0	0.0%	0	
2+ Types of Health Insurance:	345	11.0%	117	medium
Employer-Based & Direct-Purchase Health Insurance	0	0.0%	0	
Employer-Based Health & Medicare Insurance	30	1.0%	27	low
Direct-Purchase Health & Medicare Insurance	21	0.7%	17	low
Medicare & Medicaid Coverage	228	7.2%	93	medium
Other Private Health Insurance Combos	0	0.0%	0	
Other Public Health Insurance Combos	21	0.7%	31	low
Other Health Insurance Combinations	46	1.5%	34	low
No Health Insurance Coverage	0	0.0%	0	

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	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
POPULATION BY RATIO OF INCOME TO POVERTY LEVEL				
Total	3,146	100.0%	561	🟩
Under .50	371	11.8%	182	🟨
.50 to .99	836	26.6%	241	🟨
1.00 to 1.24	270	8.6%	192	🟥
1.25 to 1.49	131	4.2%	109	🟥
1.50 to 1.84	210	6.7%	106	🟨
1.85 to 1.99	65	2.1%	77	🟥
2.00 and over	1,262	40.1%	526	🟨
CIVILIAN POPULATION AGE 18 OR OLDER BY VETERAN STATUS				
Total	2,374	100.0%	316	🟩
Veteran	70	2.9%	49	🟥
Nonveteran	2,304	97.1%	317	🟩
Male	1,262	53.2%	198	🟩
Veteran	48	2.0%	42	🟥
Nonveteran	1,214	51.1%	196	🟩
Female	1,112	46.8%	183	🟩
Veteran	22	0.9%	25	🟥
Nonveteran	1,090	45.9%	183	🟩
CIVILIAN VETERANS AGE 18 OR OLDER BY PERIOD OF MILITARY SERVICE				
Total	70	100.0%	49	🟥
Gulf War (9/01 or later), no Gulf War (8/90 to 8/01), no Vietnam Era	22	31.4%	25	🟥
Gulf War (9/01 or later) and Gulf War (8/90 to 8/01), no Vietnam Era	0	0.0%	0	
Gulf War (9/01 or later), and Gulf War (8/90 to 8/01), and Vietnam Era	0	0.0%	0	
Gulf War (8/90 to 8/01), no Vietnam Era	1	1.4%	12	🟥
Gulf War (8/90 to 8/01) and Vietnam Era	2	2.9%	16	🟥
Vietnam Era, no Korean War, no World War II	38	54.3%	41	🟥
Vietnam Era and Korean War, no World War II	0	0.0%	0	
Vietnam Era and Korean War and World War II	0	0.0%	0	
Korean War, no Vietnam Era, no World War II	0	0.0%	0	
Korean War and World War II, no Vietnam Era	0	0.0%	0	
World War II, no Korean War, no Vietnam Era	0	0.0%	0	
Between Gulf War and Vietnam Era only	0	0.0%	0	
Between Vietnam Era and Korean War only	6	8.6%	9	🟥
Between Korean War and World War II only	0	0.0%	0	
Pre-World War II only	0	0.0%	0	
HOUSEHOLDS BY POVERTY STATUS				
Total	1,392	100.0%	181	🟩
Income in the past 12 months below poverty level	544	39.1%	111	🟨
Married-couple family	26	1.9%	41	🟥
Other family - male householder (no wife present)	8	0.6%	52	🟥
Other family - female householder (no husband present)	207	14.9%	79	🟨
Nonfamily household - male householder	160	11.5%	91	🟨
Nonfamily household - female householder	143	10.3%	54	🟨
Income in the past 12 months at or above poverty level	848	60.9%	172	🟨
Married-couple family	306	22.0%	151	🟨
Other family - male householder (no wife present)	60	4.3%	61	🟥
Other family - female householder (no husband present)	148	10.6%	61	🟨
Nonfamily household - male householder	191	13.7%	60	🟨
Nonfamily household - female householder	143	10.3%	46	🟨

Source: U.S. Census Bureau, 2017-2021 American Community Survey

Reliability: 🟩 high 🟨 medium 🟥 low

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	2017-2021 ACS Estimate	Percent	MOE(±)	Reliability
HOUSEHOLDS BY OTHER INCOME				
Social Security Income	449	32.3%	97	🟨
No Social Security Income	943	67.7%	179	🟩
Retirement Income	120	8.6%	65	🟨
No Retirement Income	1,271	91.3%	181	🟩
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME IN THE PAST 12 MONTHS				
<10% of Income	26	1.9%	65	🟥
10-14.9% of Income	164	12.2%	117	🟥
15-19.9% of Income	157	11.7%	70	🟨
20-24.9% of Income	87	6.5%	54	🟨
25-29.9% of Income	155	11.5%	67	🟨
30-34.9% of Income	120	8.9%	49	🟨
35-39.9% of Income	101	7.5%	49	🟨
40-49.9% of Income	140	10.4%	58	🟨
50+% of Income	348	25.9%	110	🟨
Gross Rent % Inc Not Computed	44	3.3%	62	🟥
HOUSEHOLDS BY PUBLIC ASSISTANCE INCOME IN THE PAST 12 MONTHS				
Total	1,392	100.0%	181	🟩
With public assistance income	174	12.5%	82	🟨
No public assistance income	1,217	87.5%	174	🟩
HOUSEHOLDS BY FOOD STAMPS/SNAP STATUS				
Total	1,392	100.0%	181	🟩
With Food Stamps/SNAP	797	57.3%	165	🟨
With No Food Stamps/SNAP	594	42.7%	109	🟩
HOUSEHOLDS BY DISABILITY STATUS				
Total	1,392	100.0%	181	🟩
With 1+ Persons w/Disability	608	43.7%	108	🟩
With No Person w/Disability	783	56.2%	176	🟨

Data Note: N/A means not available. Population by Ratio of Income to Poverty Level represents persons for whom poverty status is determined. Household income represents income in 2021, adjusted for inflation.

2017-2021 ACS Estimate: The American Community Survey (ACS) replaces census sample data. Esri is releasing the 2017-2021 ACS estimates, five-year period data collected monthly from January 1, 2017 through December 31, 2021. Although the ACS includes many of the subjects previously covered by the decennial census sample, there are significant differences between the two surveys including fundamental differences in survey design and residency rules.

Margin of error (MOE): The MOE is a measure of the variability of the estimate due to sampling error. MOEs enable the data user to measure the range of uncertainty for each estimate with 90 percent confidence. The range of uncertainty is called the confidence interval, and it is calculated by taking the estimate +/- the MOE. For example, if the ACS reports an estimate of 100 with an MOE of +/- 20, then you can be 90 percent certain the value for the whole population falls between 80 and 120.

Reliability: These symbols represent threshold values that Esri has established from the Coefficients of Variation (CV) to designate the usability of the estimates. The CV measures the amount of sampling error relative to the size of the estimate, expressed as a percentage.

🟩 High Reliability: Small CVs (less than or equal to 12 percent) are flagged green to indicate that the sampling error is small relative to the estimate and the estimate is reasonably reliable.

🟨 Medium Reliability: Estimates with CVs between 12 and 40 are flagged yellow-use with caution.

🟥 Low Reliability: Large CVs (over 40 percent) are flagged red to indicate that the sampling error is large relative to the estimate. The estimate is considered very unreliable.