

## Executive Summary and Overview of the Summary Report

In April of 2010, the City of Dubuque initiated the 2010 Quantitative Research Study on Crime and Poverty (referred to as *The Study* going forward) in order to provide an objective assessment of trends and perceptions of crime in conjunction with poverty, specifically poverty related elements pertaining to Section 8 housing. Over 350,000 records from various departments related to the Study's focus have been used in this analysis. The study team wishes to acknowledge the assistance and efforts of City staff in providing the raw data to the researchers for analysis.

A study of this type and scope is highly dependent on two important elements: 1) the technological software and hardware that make such an analysis feasible, and 2) the quality of the data that is available. Absent the advanced technologies in use at both organizations, a study of this depth and scope would be impractical if not impossible. Additionally, recognition of the limits of the analysis and the limitations of source data must also be taken into account by the reader. The limitations of specific analytical processes, and the raw data available, are noted in both the Executive Summary and the Report Narrative. It should be further noted that the source data used in this analysis were working "operational" data files and records that are not only fluid working documents, but are also data sets that have been created and used by multiple users, including the transfer, over time, to new and updated platforms.

## Background

In an effort to specify and analyze the relationship between crime and poverty (specifically Section 8 housing) through evidence-based information for decision-making, the City sought proposals for a robust research methodology to study recent patterns of local crime, the community's perception of crime, and the relationship (if any) of crime to other community factors.

As communicated to the study team through the RFP process and pre-study meetings, community members in Dubuque have expressed concern about crime in the community in recent years. Were crime patterns changing or was this simply a perception? What were the trends? Were there contributing factors? Were there strategies to be explored that might mitigate any changes in crime patterns? Some community members specifically shared their perception that increased crime is related to the City's Section 8 housing program, in particular.

As framed by the City in its RFP, this Study was commissioned to help clarify the actual state of crime in Dubuque and the characteristics most strongly related to the types of crimes, if any, that have

increased significantly in the past few years. Further, the Study would compare these data with the public's perception of the nature of crime and criminals in Dubuque. The findings from the Study would help guide policymakers as they decide what preventative programming might effectively prevent crime and what educational programming might provide the most useful information to the citizens of Dubuque.

### **General Research Questions Posed by the City**

Dubuque summarized the project's scope into the following broad research questions:

- ❖ Do the perception of criminal activity and its causes in Dubuque match what is actually happening?
- ❖ Within categories of crime with significant increases in **arrests**, what policies or strategies can effectively decrease crime?
- ❖ If there are cases where there are community perceptions of increased criminal activity but no evidence to support the perception, what policies or strategies can effectively address the concerns?

In accordance with the City's expressed desire to explore perceptions of increased criminal activity against actual **incidents** of crime reported as it may or may not relate to certain community sectors or programs, the Study's primary aim was to investigate, assess and report on evidence-based findings.

### **Summary of Study Scope and Research Plan**

The Study focused on a quantitative analysis of local crime and the community's perceptions of crime. As part of the scope of the Study, to evaluate perceptions of increased criminal activity against actual incidents of crime reported and recommend related strategies where necessary, the study team's primary tasks included the methodical collection, organization and analysis of key data that came directly from the City's records and data bases related to crime, housing and geographic information.

The Study integrates both quantitative analysis with qualitative research and includes a survey of community perceptions, plus a broad review of existing literature on the related topics with the aim of providing decision makers with the information necessary to investigate, assess and recommend revisions to strategies and policies, where necessary or supported by evidence-based rationales. In addition to contributing to better understandings, the analysis commissioned by the City serves to establish a mechanism for obtaining and providing meaningful information on crime and poverty to the

City of Dubuque to corroborate or dispel perceptions of crime. Ultimately, this Study is designed to educate, engage and empower the community, as a whole, to actively combat crime in order to achieve or maintain (if already in place) the ultimate outcome – a real and perceived safe community.

As stated in the Study plan, the research and analysis encompasses elements of crime and poverty, particularly the possible impact of assisted housing programs, most notably Section 8 housing units. However, it should be noted by readers of this analysis that the core focus of the Study centers around crime in Dubuque. Hence, it was not the intent of this Study to reach beyond the core focus and attempt to analyze *causes* of poverty or any other aspects of poverty other than how poverty and related variables may or may not relate to crime in Dubuque.

### **Organization & Approach to the Study and Report**

The work plan for the Study is presented in later sections of the report and is organized around the three general areas within the “Scope” section of the City’s *Request for Proposal*. The research plan was organized around the following categories of investigation:

- Part I: Literature Review & Section 8 Assisted Housing Program Background
- Part II: Community Survey & Perception Analysis
- Part III: Quantitative Analysis
  - Section I - Comparative & Trend Analysis
  - Section II - Local Data Analysis, Spatial & Statistical Analysis
  - Section III - Synthesis of Quantitative & Perception Analyses
    - Analysis Of Arrests, Crime Incidents And Housing
    - Contextual Analysis
      - Assisted/Section 8 Housing Program
      - Demographics
    - Quantitative Analysis
- Discussion of Findings and Recommended Strategies & Policies

The Study report and executive summary follow this general presentation of information as well. The report makes extensive use of appendices, exhibits and other forms of supporting documents that, together, represent the totality of the research effort for this analysis.

## SUMMARY OF NOTABLE FINDINGS

### Part I: Literature Review & Section 8 Assisted Housing Program Background

#### Dubuque Crime and Housing Study: Synopsis of Findings from Literature Review

The study team condensed the topics presented by Dubuque in the RFP into the following major subject areas:

##### *Public Housing, Section 8 and Crime*

1. The relationship between the mobility of Section 8 housing vouchers and **crime displacement**
2. General relationships between Section 8 housing and crime

##### *Crime in General and Crime in Mid-sized Communities*

3. Crime and Social Disorganization
4. General causes of crime in mid-sized communities
5. Contributing factors to the perception of increased crime

##### *Effective Strategies Preventing Crime/Addressing Perception of Crime*

6. Effective strategies/policies for preventing crime displacement from one community to another
7. Effective strategies/policies for preventing crime related to Section 8 housing in general
8. General effective strategies/policies for preventing crime in mid-sized communities
9. Effective strategies/policies to alleviate the perception of crime

#### Summary of Literature Review Results

Currently there is no consensus about the effect of public housing on crime and **crime diffusion** in the literature. This often depends on the concentration, location, and physical design characteristics of a city's projects. Section 8 housing projects that are smaller, more dispersed, garden style, have defensible space, and are located in less resource poor neighborhoods, have not been found to be linked to crime or crime diffusion (Roncek et al 1981; Galster et al 2003; Griffiths and Tita 2009; Holzman et al 2001; Berry and Jones 1995; Galster et al 2002). Large, high rise towers that are concentrated in resource poor neighborhoods do affect crime rates, which diffuse outwardly (Davies 2006; Suresh and Vito 2009).

Community policing, problem-oriented policing, and hot spots policing are effective crime fighting strategies (Sherman 1986; Xu et al 2005; Mazerolle et al 2000; Braga et al 1999; Braga 2006;

Braga and Bond 2008). Community policing has been found to reduce fear through improving police relations with citizens and reducing social and physical incivilities (Roh and Oliver 2005; Adams et al 2005; Hinkle and Weisburd 2008).

Reducing social and physical disorder is the most reoccurring theme in the literature about lessening fear of crime. That is why community policing is important. Other important disorder and fear reduction strategies include problem oriented policing (Mazerolle et al 2000; Braga et al 1999), hot spots policing (Braga 2006; Braga and Bond 2008), and broken windows policing (provided it is combined with community policing).

Crime correlates in mid-sized cities are similar to those in larger cities. Areas with high levels of concentrated disadvantages (high levels of poverty, unemployment, female headed households, and minority concentrations) tend to also have high violent crime rates (Ackerman and Murray 2004). Another cause of mid-size city crime is geographic based racial segregation (Shihadeh 2004). Goodman (1997) and Goodman and Mann (2005) found that as the number of police per 10,000 people increased, mid-sized city crime decreased. They also found that allowing off-duty officers to drive squad cars provides an added deterrent effect, thereby lowering crime rates.

Research has shown Closed Circuit Television (CCTV) cameras to be moderately effective at crime control. Welsh and Farrington (2009) conducted a meta-analysis of 44 studies. The Study's combined effect size revealed that CCTV reduced overall crime by 16%, which is a modest but statistically significant decline. Much of the overall crime reduction is caused by CCTV's effectiveness in parking lots. The authors found that using CCTV in parking lots resulted in a 51% decrease in crime. The use of CCTV in city/town centers, public transportation systems, and in public housing areas was not found to cause a statistically significant reduction in crime.

Curfews have long been a popular crime control method. However, there is little evidence to suggest that curfews effectively reduce **juvenile** crime. Adams (2003) conducted a systematic literature review to examine the effect of curfews on juvenile crime rates. He uncovered ten studies relating to the topic. The results were mixed, with studies reporting a combination of no crime change, crime decreases, and some even reported crime increases. Given the inconsistent results, the author concludes that the research fails to support the use of curfews as a crime control strategy. However, Adams did find some evidence to suggest that driving curfews decrease the rate of automobile crashes by reducing teenage licensure, because driving becomes less appealing to teenagers.

Though the literature provides for multiple strategies that may be appropriate for mid-sized communities such as Dubuque, it is important to note that no two communities are alike, nor have any of the authors been able to generalize their Study's findings. Each municipality's existing landscape of crime, demographics and policies must be taken into consideration, including the legal, fiscal, and technical feasibility as well as the political acceptance of each strategy and/or combination of strategies.

The study team strongly encourages anyone interested in the topic of crime, perceptions of crime, contributing factors to crime, crime and public housing or community policing and policing strategies to read through entire summary of the literature review section of this report, and the accompanying bibliography.

## **Part II: Community Survey & Perception Analysis**

### **Public Opinion Results**

The City expressed a desire for a direct assessment of community attitudes and perceptions of safety in their community along with other features relevant to the present analysis. To obtain empirically reliable data from the community, NIU, through the services of its Public Opinion Laboratory (POL), developed and undertook a random sample of the community. To ensure that the results were representative, NIU's POL used a random-digit-dialed telephone sample of City of Dubuque residents. Only adults age 18 or older were interviewed. With ~25,000 households in the City, the margin of error for these results will be + 4.3 percentage points for a statistically valid sample of +/- 500 households.

Also, the survey responses within the sample were weighted to remove biases pertaining to age of responders to better match the target population. The first column in the following table reflects the 2000 Census demographics for Dubuque, whereas the second column reflects the actual responders and the third column indicates the responses adjusted to remove the bias of the uneven distribution (demographics versus respondents) of responders. The majority of the responders were comparable in terms of other City 2000 Census demographics (i.e., gender and race), yet the age of responders was significantly different than the age demographics of Dubuque. "As a simple case, imagine that you survey 100 Americans ages 15 to 64: 60 males and 40 females. For that age range, it should be 50/50. To correct for this, in your analysis you weight each male's answers to be worth 0.83 of a response and

each female's answers to be worth 1.25 responses. Now the survey results should, in theory, better reflect the target population.”<sup>1</sup>

Furthermore, City staff members worked with POL researchers to refine and review the questionnaire/interview questions used for the survey. Questions were designed in line with the City's particular interests on the subject matter under study. A copy of the survey questions can be found as an Appendix to this report.

#### ES-Image 1: Demographic Characteristics of the 2000 Population and the Survey Respondents

	2000 Census	Survey Respondents (Unweighted)	Survey Respondent (Weighted for Age)
<b>Gender</b>			
Male	46.3%	43.8%	46.1%
Female	53.7%	56.2%	53.9%
<b>Age</b>			
18-30 years	24.4%	6.6%	24.3%
31-50 years	36.7%	26.1%	36.7%
51-70 years	23.3%	39.2%	23.3%
71 years and older	15.6%	28.1%	15.6%
<b>Race<sup>a</sup></b>			
Caucasian/White	97.0%	97.4%	98.4%
African American/Black	1.0%	1.2%	1.4%
Native American	0.2%	0.4%	0.2%
Asian American	0.7%	0.6%	1.1%
Latino	1.4%	0.4%	0.2%
Multiracial	0.5%	0.2%	0.1%
<b>Home Ownership<sup>b</sup></b>			
Own current housing	67.5%	83.2%	80.2%
Rent current housing	32.5%	13.8%	14.8%
<b>Overall N</b>	44,049	502	502

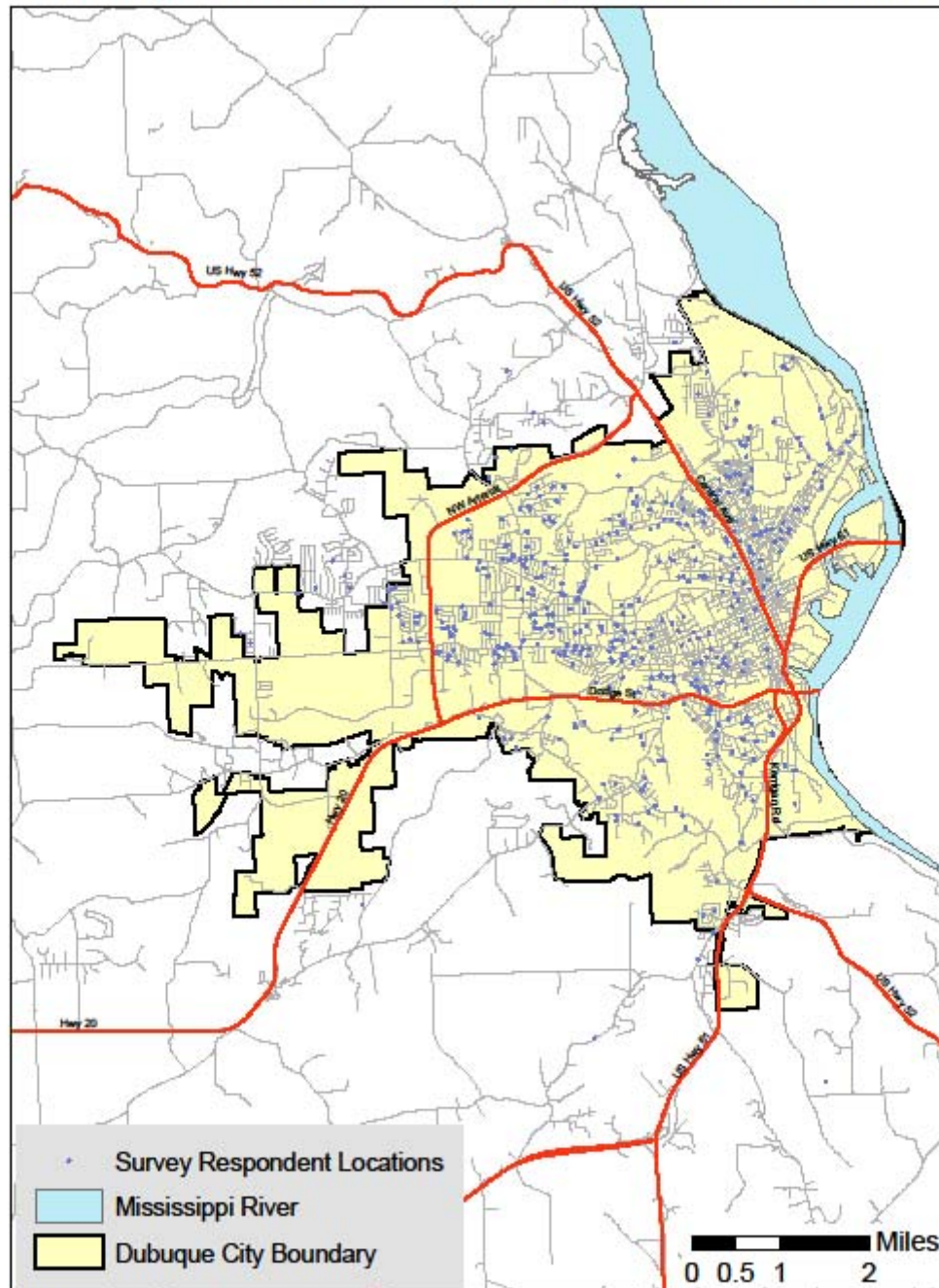
Note - Four respondents did not report their race. <sup>b</sup> One respondent did not report their home ownership status.

The telephone survey of residents of the City of Dubuque was conducted between June 17 and July 21 of 2010. The survey was designed to determine residents' opinions and experiences regarding crime and safety issues within the city limits. Respondents were also asked for their suggestions for improving safety in the city. In total, the POL conducted telephone interviews with 502 residents of Dubuque with the average length of the interviews being 19.1 minutes.

<sup>1</sup> <http://blog.vovici.com/blog/bid/28030/Survey-Weighting-Weight-Weight-Don-t-Tell-Me>



## Dubuque POL Survey Respondent Locations



Data Source: Survey Data  
NIU Public Opinion Lab



The following results represent findings of interest resulting from an analysis of the responses from the community survey. The findings of interest are presented in two categories: 1) simple frequencies of responses represented as a percentage of respondents sharing the same opinion; and, 2) **cross tabulations** that represent the inter-relationship of two variables within the survey data but do not reveal causal relationships.

## 1. Findings of Interest: Frequency Tables

### Findings of Interest: Frequency Tables

- The majority of the sample (84%) had lived in Dubuque for 11 or more years, with nearly four out of ten (42%) residing in the city for 35 or more years.
- Nearly nine out of ten respondents (86%) characterized Dubuque as an excellent or good place to live.
- Among the respondents who had lived in the City for five or more years, nearly four out of ten (38%) indicated that Dubuque had become a much better or somewhat better place to live within the past five years.
- Nearly six out of ten respondents (57%) indicated that the City of Dubuque was doing an excellent or good job in addressing safety.
- Two-thirds (68%) said the Dubuque police department was doing an excellent or good job in addressing crime.
- The vast majority (88%) of respondents reported that their neighborhood was an excellent or good place to live. A small minority of respondents (2%) said they felt very or somewhat unsafe in their neighborhood during the daytime, whereas 11% indicated their neighborhood was very or somewhat unsafe at night.
- The most common safety issues rated as being a “major problem” by more than 10% of respondents were:
  - Drugs (33%)
  - Violent Crimes (23%)
  - Gang Activity (22%)
  - Unsupervised Children (18%)
  - Property Crimes (17%)
  - Domestic Violence (14%)
  - Vandalism (14%)
  - Public Drinking (14%)

### Findings of Interest: Frequency Tables

- Only 19% of respondents felt very or somewhat unsafe in downtown Dubuque during the daytime; however, 71% indicated feeling very or somewhat unsafe downtown at night.
- More than three-quarters of respondents (76%) indicated that crime was a major or moderate problem in Dubuque. Among the respondents who had lived in the City for five or more years, 89% said that crime had increased significantly or somewhat within the past five years.
- Approximately one out of ten respondents (12%) indicated that crime was a major or moderate problem in their neighborhood.
- Among the respondents who had lived in the City for five or more years, 25% said that crime in their neighborhood had increased significantly or somewhat within the past five years.
- Two out of ten respondents (22%) indicated that they were the **victims** of a property crime (or threatened with a property crime) within the past year. More than half (55%) of these incidents were reported to the police.
- One out of ten respondents (10%) indicated that they had been attacked (or threatened with attack) in the past year. Only one-quarter (25%) of these incidents were reported to the police.

## 2. Findings of Interest: Cross-Tab Analysis Significant at the .05 level

Education	
▪	People with higher levels of education tend to feel higher levels of safety and lower levels of concern about crime and disorder
▪	People with bachelor's degrees are less likely to rate crime as a moderate to major problem in Dubuque
○	Those with at least a bachelor's degree are more likely to feel safe in downtown Dubuque at night.
○	Those with at least a bachelor's degree have lower levels of concern about being physically attacked or mugged/robbed. They are also less concerned about having their homes and cars broken into.
○	Social disorder problems, such as drugs, loitering, disruptive teens, noise (significant negative ordinal relationship) and public drinking are less likely to be rated as moderate to major problems by those with at least a bachelor's degree.
Gender	
▪	Women in Dubuque feel lower levels of safety and higher levels of concern about crime and disorder than men do.
○	Women are more likely to rate crime as a moderate to major problem in Dubuque.
○	Women are less likely to feel safe in downtown Dubuque in the day and at night.
○	Women are more likely than men to rate social disorder problems, such as drugs and unsupervised children as moderate to major problems in Dubuque.
○	Women have higher levels of concern about having one's car broken into and being sexually assaulted.
Age Category	
▪	There is a positive ordinal relationship between age and respondent ratings of how bad the loitering problem is in Dubuque. The likelihood that respondents will rate loitering as a major problem increases with age.

<b>Length of Residence in Dubuque</b>	
<ul style="list-style-type: none"> <li>People who lived in Dubuque at least 21 years were significantly more likely to rate crime as a moderate to major problem. People who have lived in Dubuque longer are less likely to feel safe downtown in the day.</li> </ul>	
<ul style="list-style-type: none"> <li>People who have lived in Dubuque longer are less likely to feel safe downtown at night.</li> </ul>	
<ul style="list-style-type: none"> <li>There is a positive ordinal association between length of residence and perceiving loitering and unsupervised children as moderate to major problems in Dubuque.</li> </ul>	
<ul style="list-style-type: none"> <li>There is a positive ordinal association between length of residence and higher levels of concern about being physically attacked, being mugged/robbed and having one's house broken into.</li> </ul>	
<ul style="list-style-type: none"> <li>However, not all the relationships between length of residence and fear of crime/disorder are linear.               <ul style="list-style-type: none"> <li>People who have lived in Dubuque at least 21 years are more likely to rate drugs and disruptive teens as moderate to major problems.</li> <li>People who have lived in Dubuque less than 11 years, or at least 35 years, are more likely to rate noise as a moderate to major problem. They are also more likely to be moderately to extremely concerned about being sexually assaulted.</li> </ul> </li> </ul>	
<b>Previous Physical Attack Victimization</b>	
<ul style="list-style-type: none"> <li>Previous physical attack victims are less likely to feel safe in downtown Dubuque in the day and at night.</li> </ul>	
<ul style="list-style-type: none"> <li>Social disorder problems, such as drugs, public drinking, unsupervised children and disruptive teens are more likely to be rated as moderate to major problems in Dubuque among previous attack victims than non-victims.</li> </ul>	
<ul style="list-style-type: none"> <li>Previous victims have higher levels of concern about being physically attacked, being mugged/robbed, and having one's car broken into.</li> </ul>	
<b>Previous Damage Or Vandalism To Property</b>	
<ul style="list-style-type: none"> <li>Residents who have had their property damaged or vandalized in the past year are more likely than those who have not to rate crime as a moderate to major problem in Dubuque.</li> </ul>	
<ul style="list-style-type: none"> <li>Previous property damage victims are less likely to feel safe downtown at night.</li> </ul>	
<ul style="list-style-type: none"> <li>Previous property damage victims are more likely than non-victims to rate public drinking, loitering, disruptive teens, and unsupervised children as moderate to major problems in Dubuque.</li> </ul>	
<ul style="list-style-type: none"> <li>Previous property damage victims have higher levels of concern about being physically attacked, being mugged/robbed, having one's car broken into, and having one's home broken into.</li> </ul>	
<b>Homeownership</b>	
<ul style="list-style-type: none"> <li>Non-homeowners tend to have more fear and concern about crime and disorder than homeowners do.               <ul style="list-style-type: none"> <li>Non-homeowners are more likely to rate disruptive teens, public drinking and noise as moderate to major problems in Dubuque.</li> </ul> </li> </ul>	

## **Part III: Quantitative Analysis**

### **Comparative & Trend Analysis**

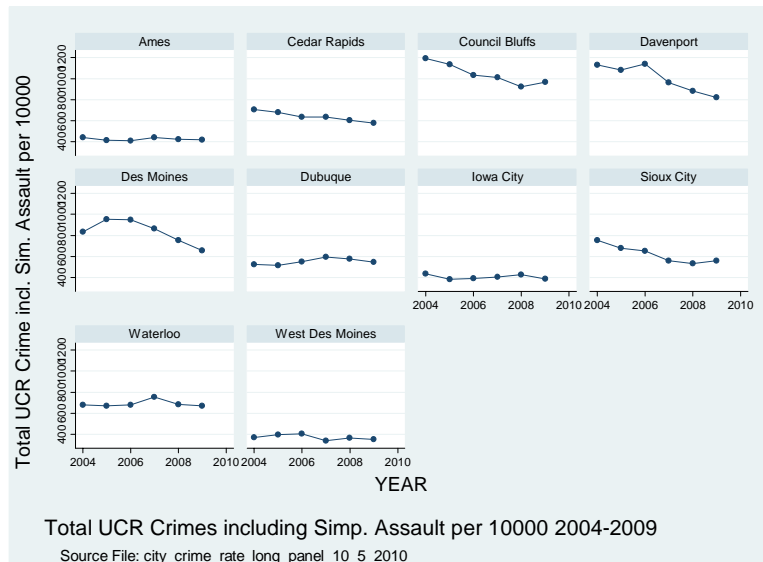
Dubuque's UCR property and violent crime rates were analyzed in the context of nine other Iowa cities with comparable populations: Ames, Cedar Rapids, Council Bluffs, Davenport, Des Moines, Iowa City, Sioux City, Waterloo, and West Des Moines. Crime rates for the 6-year period of 2004-2009 were included in the analysis.

Approximately 17,000 agencies from 50 states contribute to the FBI's UCR data each year. Though the data is useful for analyzing crime statistic trends, the FBI discourages using the data to rank agencies to measure law enforcement effectiveness.<sup>2</sup> Caution in reporting and describing crime statistics of multiple agencies' UCR data is required because this data is derived from agencies that may have local offense definitions that differ from the FBI's UCR offense descriptions and must be adjusted in order to integrate with the FBI's UCR reports. This study team acknowledges the rationale for not ranking and the need to proceed in examining Dubuque's comparables on a descriptive basis only. Thus, charts and figures illustrate Dubuque's and its comparables' offense statistics together in order to prompt the City to further investigate areas where they are significantly different than its peers. The purpose of these types of reviews is to encourage the City to ask "how (in which categories or years) might we be different?" and "why might we be different?" Addressing these questions can lead to changes in policies that can enhance law enforcement techniques for Dubuque.

As noted in a later section of this comparative analysis, the inspection of comparative UCR crime rates during 2004 to 2009 for the ten comparably sized Iowa cities reveals that, overall; Dubuque's crime profile is not uniquely different from the other cities. However, the analysis did point to some differences with regard to offenses classified as violent crime, using the standard UCR coding approach.

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<sup>2</sup> Source: FBI Uniform Crime Reports <http://www.fbi.gov/about-us/cjis/ucr/word>



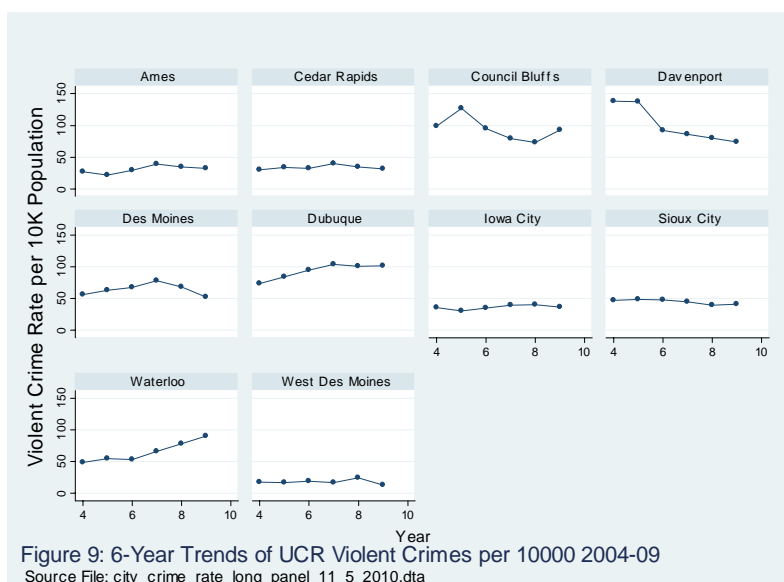
### *Uniform Crime Reports (UCR) Property Crime*

Dubuque's level of UCR property crime rate was below the average of the ten cities, ranking it 7<sup>th</sup> lowest among the cities. Enough variation in these average rates across cities exists to be statistically significant. Simple measures of city income, such as white per capita income and percent families living below the poverty level, can account for some of this variation in average rates.

When examining the trends in UCR property crimes within and across the ten cities, there was no statistically significant difference in the linear trend lines summarizing the overall declining rates of UCR property crime from 2004 to 2009.

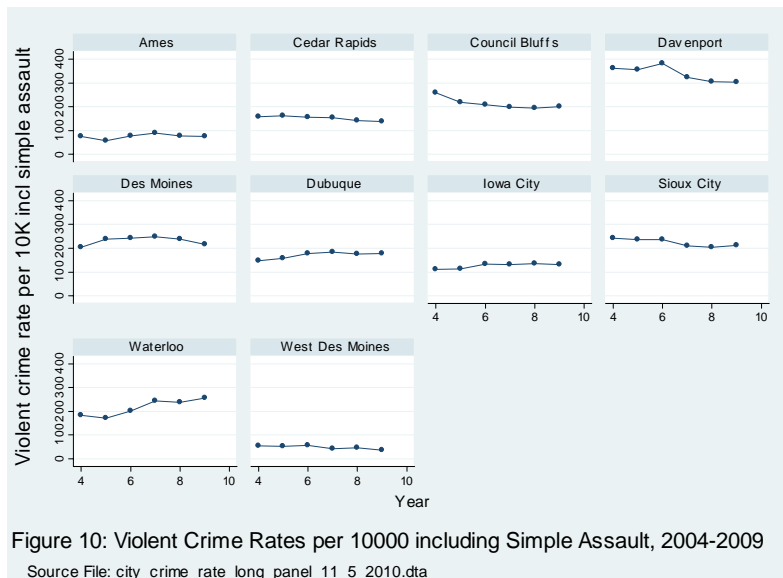
## UCR Violent Crime

The 6-year averages for the ten cities were compared on UCR violent crime rates, making an adjustment by adding simple assault along with aggravated assault due to the apparent anomalous incidents of those two crimes in Dubuque. This anomaly involving Dubuque's simple assaults and aggravated assaults is discussed on pages 22 and 23. When UCR violent crime is analyzed in the standard method, adding in only aggravated assault, Dubuque reported the third highest average UCR violent crime rate (93.17 per 10,000) among the ten cities. This higher level than average was large enough to be considered statistically significant, even with this small sample size. Dubuque's UCR violent crime rate is similar to those of Davenport (101.44 per 10,000) and Council Bluffs (94.42 per 10,000) using the standard definition of UCR violent crimes.



The varying 6-year average UCR violent crime rates are strongly associated with the usual indicators of city income and poverty. Thus, Dubuque's higher levels of violent crime can be generally understood in terms of Dubuque's relative positions on median family income, and its complementary measure of poverty, and percent of families living in poverty relative to more advantaged cities used in this comparison. Dubuque's higher average UCR crime rate is attributable to the different levels of simple and aggravated assault when compared to other cities. All other cities have higher rates of simple assault than aggravated assault; Dubuque's distribution is the reverse: it reports higher levels of aggravated than simple assault. When simple assault is added as a violent crime, Dubuque's 6-year average violent crime places it in the middle of the comparison cities rather than in the top three.





Furthermore, statistical estimates of linear trend lines of changes within each city revealed that the changes in UCR violent crime over the period of 2004 to 2009 followed different patterns. These estimated linear trend lines showed Dubuque to have one of the larger upward trending lines (5.7 violent crimes per 10,000 per year) over this period (second to Waterloo, 8.4). The variation in the estimated trend lines across cities was large enough to be considered non-random.

Lacking yearly estimates of median income and poverty measures, the analysis attempted to model the variation in trend lines, hence trying to explain the increasing and decreasing crime patterns using static measures of city household and family income and poverty measures. None of these static measures could account for the varying trend lines consistently, but for the more inclusive measure of violent crime that included simple assault, poorer cities (on two measures, percent families in poverty and median household income) were estimated to have slightly higher rates of increase in violent crime.

The findings associated with the assault data generated a dialogue with City staff in an effort to better understand or explain the anomaly found relative to the reporting of simple and aggravated assaults. The dialogue resulted in a recent analysis by the City of the historical treatment of these offenses when records were coded and reported in the Police Department's crime record data base system. The analysis by City staff and Police Department management revealed the following finding that sheds light on the anomalies found in the assault data. The following finding was shared with the study team:

“A review of our data that is reported to UCR shows that ALL cases of Assault with Injury under Iowa Code 708.2(2) are reported to UCR as Aggravated Assaults. A review and comparison of the definitions in the handbook and the listed codes shows that in most instances we are over reporting this classification. While some cases of Assault with Injury cases may fit the definition of Aggravated Assault as described in the UCR Handbook, minor injuries such as scratches, bumps, bruises, etc. which make up the majority of our Assault with Injury cases, would not fit the UCR definition, yet they are reported to UCR as Aggravated Assaults.” *Chief Dalsing research memorandum, Nov. 10, 2010.*

The results of this analysis add understanding and context to the pattern of differences the study team found when comparing Dubuque’s statistics for aggravated and simple assaults. The analysis of reporting protocols within the Police Department provided by the City indicate that the “over reporting” of incidents as aggravated could be substantial. Staff provided an analysis that indicated that reported 2009 aggravated assaults totaled 265, but when applying UCR criteria for these offenses, 250 would be classified as simple assaults rather than aggravated assaults. This represents a substantial difference and is likely impacting the analysis of data that was provided to the study team for comparative/UCR analysis.

### **Statistical Analysis Of UCR Violent Crime Rates Per 10,000 Across 10 Iowa Cities**

Figures 1 – 5 of this section describe the 6-year average of UCR violent crimes across the 10 Iowa cities. As the data indicate, Dubuque does not have uniquely high rates of violent crime, with the only exception being aggravated assault, the most common violent crime. This led us to examine the rates of simple assault as well, a crime usually excluded from the UCR counts of assault. Dubuque has relatively high aggravated assault rates and relatively low simple assault rates. This is the only feature visibly distinguishing Dubuque’s violent crime rates in the graphs. Assaults are by far the more commonly occurring type of violent crime.

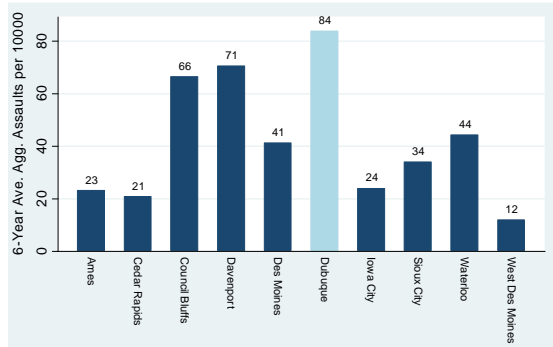


Figure 1: Average Aggravated Assaults per 10000 2004-2009: 10 Iowa Cities

Source File: city\_crime\_rate\_long\_panel\_11\_5\_2010.dta

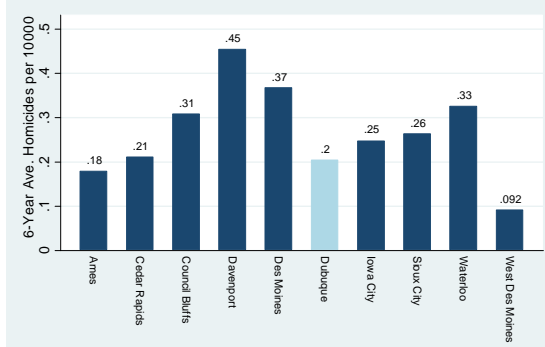


Figure 2: Average Homicides per 10000 2004-2009: 10 Iowa Cities

Source File: city\_crime\_rate\_long\_panel\_11\_5\_2010.dta

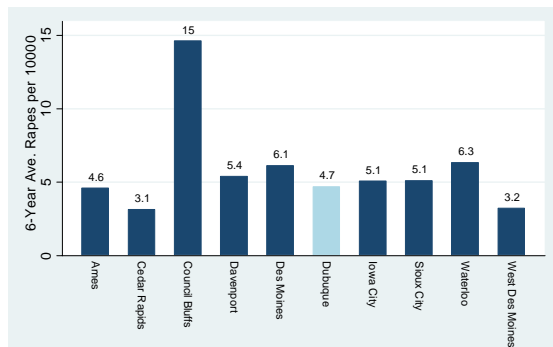


Figure 3: Average Rapes per 10000 2004-2009: 10 Iowa Cities

Source File: city\_crime\_rate\_long\_panel\_11\_5\_2010.dta

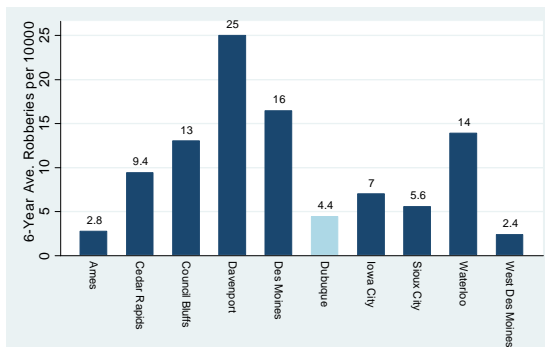
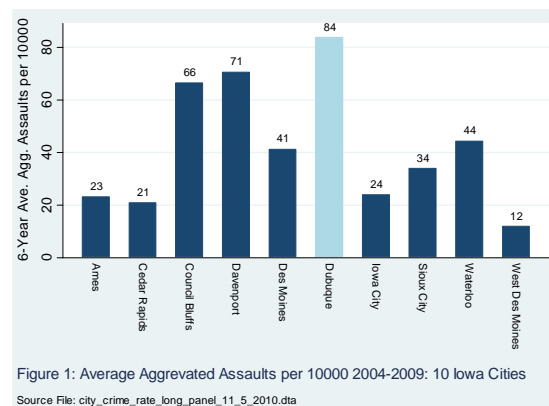
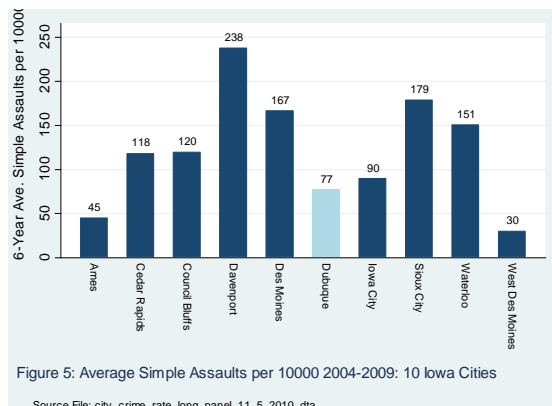


Figure 4: Average Robberies per 10000 2004-2009: 10 Iowa Cities

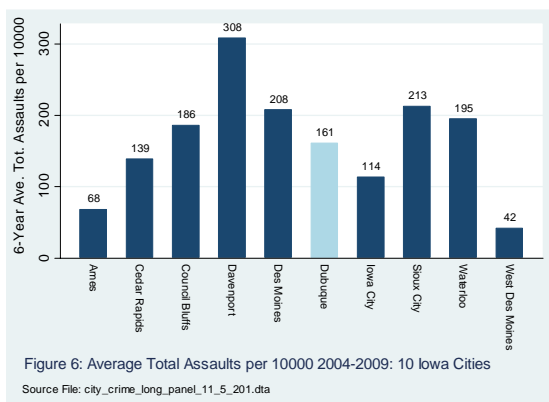
Source File: city\_crime\_rate\_long\_panel\_11\_5\_2010.dta

In every city but Dubuque, the rates of simple assaults exceed those of aggravated assaults by factors ranging from roughly 2:1 to just over 5:1 (compare the rates in Figure 1 to those in Figure 5 below). However, in Dubuque, the opposite is the case: aggravated assault rates exceed simple assault rates, a pattern anomalous from the usual case. On face value, Dubuque has higher rates of aggravated assault and lower rates of simple assaults than the comparison cities.

While UCR coding classifications are well defined in the Uniform Crime Reporting Handbook (Federal Bureau of Investigation 2004), it is possible that rules used to charge and classify assaults in Dubuque vary as well as the actual crime levels of simple and aggravated assaults.



The anomaly of the different rates of aggravated and simple assaults warranted treating the assault category with two different approaches in the subsequent statistical analysis. We first analyzed the violent crime rates using the standard UCR definition of including aggravated assault along with the other measures, and then we repeated the analysis adding in the simple assaults as well as the aggravated assaults to obtain the UCR violent crime rates for each city. The varying levels of the total assault rates for the ten cities are graphed in Figure 6. When considering total assault rates, Dubuque's rate (161) is closer to the average total assault rates for the ten cities (163).



## Summary Findings Regarding the Rate and Trend of Violent Crime Across 10 Iowa Cities

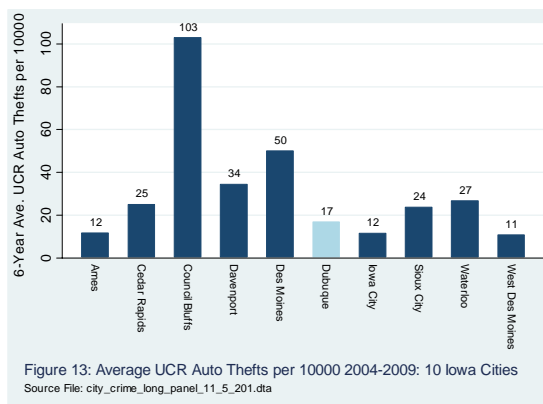
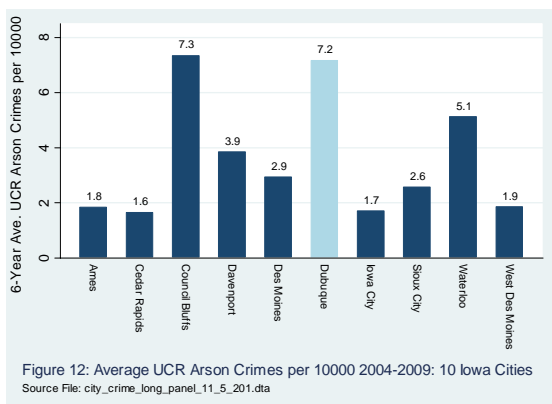
Six-year average UCR violent crime rates across these ten Iowa cities are statistically dependent upon income and poverty levels of the cities. As the percent of families with incomes below the poverty level increase, so does the average violent crime rate. Just as the average violent crime rates depend on

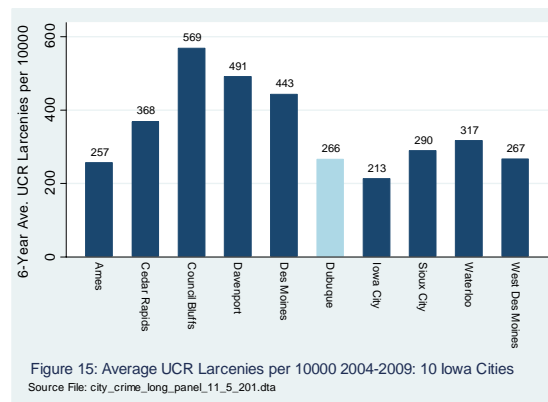
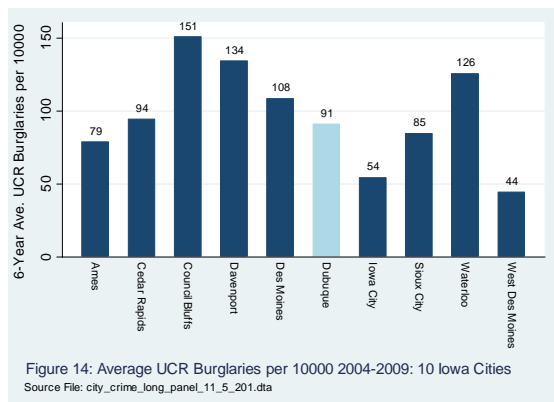
poverty levels, so do the starting levels of violent crime rates in 2004 depend on the poverty levels of the ten cities.

However, the analysis was unable to find a statistically significant city level correlate with the varying estimates of the trend line slopes summarizing changing UCR violent crimes rates across the cities. The only potentially emergent poverty or income indicator was the level of household income inequality in cities estimated using a measure of household income inequality, the GINI coefficient. The effect is in the expected direction; cities with higher levels of household income inequality have somewhat steeper increasing slopes of UCR violent crime rates over this 6-year period, but the effect was not statistically significant at the usual .05 or .10 levels. When simple assault is added as a violent crime, the median household income and the percent of families in poverty affect the estimates of the linear trends: poorer cities had somewhat higher rates of increases in violent crime.

### Statistical Analysis Of UCR Property Crime Rates Per 10,000 Across 10 Iowa Cities

UCR property crimes include arson, auto theft, burglary, and larceny. Our category of larceny includes all of the theft and larceny categories provided in the Iowa Dept. of Public Safety crime data reports. Larcenies comprise the largest category of property crime. The 6-year average rates of the four property crimes are graphed in Figures 12 – 15. These graphs show Dubuque as having close to average property crime rates except for the high level of arsons, but arsons are a low frequency crime, so small numeric differences can translate into misleading rate comparisons. There appears to be nothing notable about Dubuque's relative position among the ten cities with respect to the four UCR property crime categories – it is in the middle of the pack.





The table and figure below describe the UCR property crime rates for the ten Iowa cities in this analysis. The property crimes range from a high of 830 property crimes per 10,000 population for Council Bluffs to a low of 280 property crimes per 10,000 population for Iowa City. Dubuque's UCR property crime rate (381) ranks seventh lowest among the ten cities, below the overall average (480). While there appears to be significant variation among the cities, Dubuque is less burdened by property crime than its comparative cities.

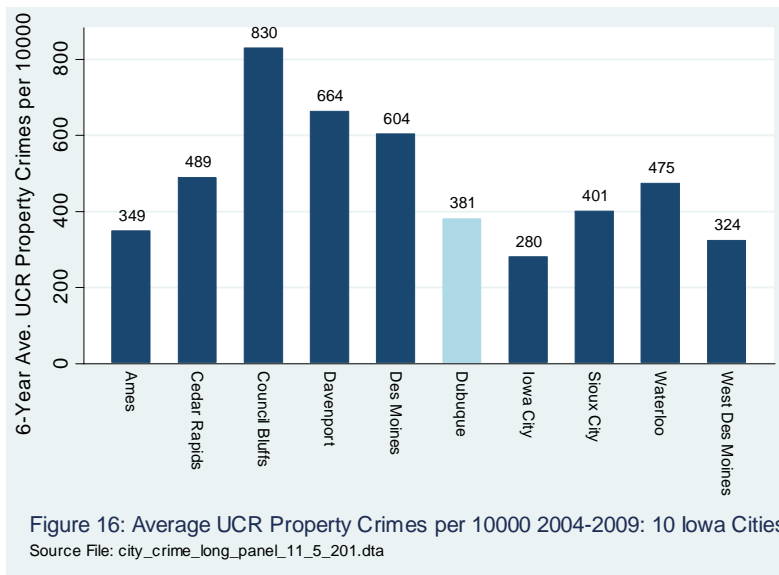
The coefficient of variation indicates relatively small year-to-year fluctuations around the 6-year averages for the cities. Dubuque's yearly deviations amount to just over 5.6% of its average value; one of the lowest observed variations relative to the average rate seen across the ten cities. Even the cities with the largest relative variations have fluctuations amounting to only fifteen to seventeen percent of the average 6-year values. These results indicate fairly small year-to-year variations in property crime rates, relative to their averages, for all of the cities examined.

**ES-Image 2: Comparative 6-Year Averages in Property Crime Rates per 10,000 Population – 10 Iowa Cities for Years 2004 to 2009**

Iowa City & Place Code	Avg. 6 year Property Crime Rate	Standard Deviation	Coefficient of Variation
Ames (1901855)	349.22244	10.794683	3.09112
Cedar Rapids (1912000)	489.42982	38.973297	7.96300
Council Bluffs (1916860)	830.19975	80.527680	9.69980
Davenport (1919000)	664.06699	101.923860	15.34843
Des Moines (1921000)	604.29028	107.460520	17.78293
<b>Dubuque (7) (1922395)</b>	<b>381.30791</b>	<b>21.467907</b>	<b>5.63007</b>
Iowa City (1938595)	280.36037	25.998742	9.27333
Sioux City (1973335)	400.63828	69.547577	17.35919
Waterloo (1982425)	474.55089	37.109896	7.82000
West Des Moines (1983910)	324.33218	20.717293	6.38768
Overall 10 Cities	479.83989	174.91313	36.45239

F-Statistic (47.45, df=9; p-value < .0001)

Coefficient of Variation = (Std. Dev. / mean)\*100. It reflects the yearly variation in the rate as a percentage of the average rate.



### Summary Findings Regarding the Rate and Trend of UCR Property Crime Across 10 Iowa Cities

The six-year average UCR property crime rates showed significant variation across the ten cities: but Dubuque was not the focus of the differences. Rather, Council Bluffs, Davenport, and Des Moines differed from the other seven cities due to their higher levels of property crime.

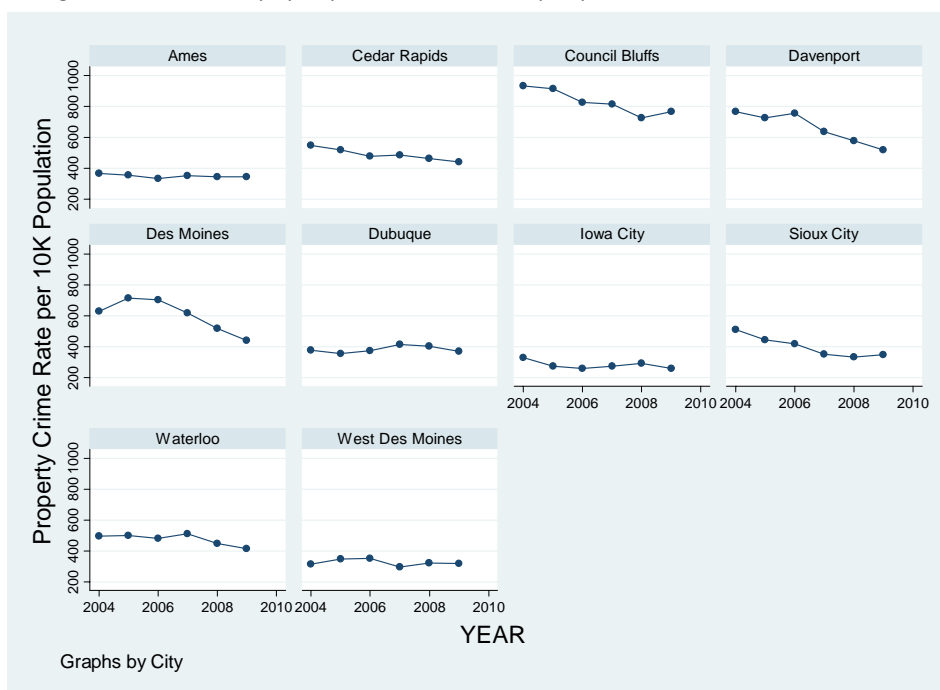
These statistical differences in UCR property crime rates were associated with two measures of city level income and poverty: negatively associated with white per capita income (as white per capita



income increased, property crime rates decreased), and positively associated with the percent of families below the poverty level (as family poverty levels were higher, so were the property crime rates).

Neither any substantively notable nor statistically significant variation in the trends of property crime over this period across the cities emerged in this analysis. Dubuque was the sole city estimated to have a very slightly increasing property crime rate while all other cities had decreasing trend lines, but the different slope estimated for Dubuque is small enough to be a random fluctuation around the generally decreasing trend line for all the cities.

Figure 17: Six Year, City by City Patterns of UCR Property Crime Rates, 2004-2009



## **Geo-Coding and Spatial Analysis Results**

**Spatial analysis**, at its core, is an analytical technique that identifies the spatial distribution of particular variables or pieces of information selected for examination. The study team proposed, as part of the research effort, the geo-coding of relevant data and variables as part of the overall investigation of the research questions posed by the City. The summary maps that follow depict some of the key results from the geo-coding exercise. Geo-coding is the process of assigning latitude/longitude to a data point or address from a particular information source. The maps that follow present a summarization of Crime (Arrest and Incident) and Section 8 Housing locations for the years that are under study. Detailed

maps broken down by year and aggregate maps using Census Block Groups can be found in the Appendix of this Summary Report.

The input of over 168,000 records, including crime incidents, arrestees, arrest locations, housing program locations and survey respondents, was the first step required in the spatial analysis before moving to statistical modeling and measurement. Crime mapping, using **GIS analysis** techniques, facilitates the tracking and understanding of all these data by producing density and cluster maps showing patterns.

Going forward there will be a few key terms used repeatedly that should be briefly defined/described up front. The table below highlights a few terms that are worth of introducing before proceeding through the analytical sections of this report. The remaining definitions and terms can be found in the final Appendix labeled “Glossary.”

Term	Definition
<i>Arrest</i> <sup>3</sup>	A seizure or forcible restraint; an exercise of the power to deprive a person of his or her liberty; the taking or keeping of a person in custody by legal authority, especially, in response to a criminal charge
<i>Authorized Section 8</i>	Includes individuals contained within the Dubuque Housing data file. Voucher holders as well as dependents within this file are considered “authorized” residents or participants of Section 8.
<i>Complainant</i> <sup>4</sup>	The party who makes the complaint in a legal action or proceeding
<i>Incident</i>	Incidents include events with associated arrestees, victims or victims’ businesses, complainants, complainants’ businesses and other involvements (i.e., accident driver, business owners or vehicle passengers associated with the accident, businesses, cited persons, deceased persons, missing persons, owners of involved vehicle or property, pedestrians and other individuals impacted by the event) – referred to as involvement records. Individuals such as adult or juvenile suspects and witnesses are not included in this data. For example, incident A has one arrestee, two victims and one witness. The record of this witness is dropped from this data set and Incident A is counted as ONE incident for this incident count table. Given another example, Incident B has one Juvenile suspect and has no arrestees, no victims and no other individuals involved.

<sup>3</sup> <http://legal-dictionary.thefreedictionary.com/arrest> (accessed December 9, 2010).

<sup>4</sup> <http://www.merriam-webster.com/dictionary/complainant> (accessed December 9, 2010).

Term	Definition
	Incident B is not included in this data set. Each incident event with multiple arrestees, victims or individuals involved is counted once.
<i>Juvenile</i>	A person under 18 years of age. Juvenile arrestees were not included in the analyses. The arrest data received from Dubuque contained arrestees with adult charges. However there are few arrestees under the age of 18. For years 2006 through 2009, the data file contained approximately 60 unique arrestees under the age of 18.
<i>“Total” Arrestee, Victim or Complainant</i>	An individual who is charged (Arrestee) or reports a charge (Complainant) or is the recipient of harm generated by a charge (Victim) is included in a “total” count for each incident they are associated with in a given year. For example, an incident that took place in 2006 involves an arrestee with four charges. This same arrestee is later charged with three other crimes in a separate incident within that same year. This arrestee will have two separate records in 2006’s “total” arrestee count.
<i>“Unique” Arrestee, Victim or Complainant</i>	An individual who is charged (Arrestee) or reports a charge (Complainant) or is the recipient of harm generated by a charge (Victim) is counted as “unique” when they are counted only once in a given report year regardless of whether or not they have been involved in multiple incident events or have multiple charges. For example, if a complainant reports an incident in 2007 and later reports another, non-related, incident in the same year, this complainant will have only one record in the “unique” complainants count.
<i>Victim<sup>5</sup></i>	“One that is acted on and usually adversely affected by a force or agent <the schools are victims of the social system>: as a (1) : one that is injured, destroyed, or sacrificed under any of various conditions <a victim of cancer> <a victim of the auto crash> <a murder victim> (2) : one that is subjected to oppression, hardship, or mistreatment <a frequent victim of political attacks> b : one that is tricked or duped <a con man's victim>”

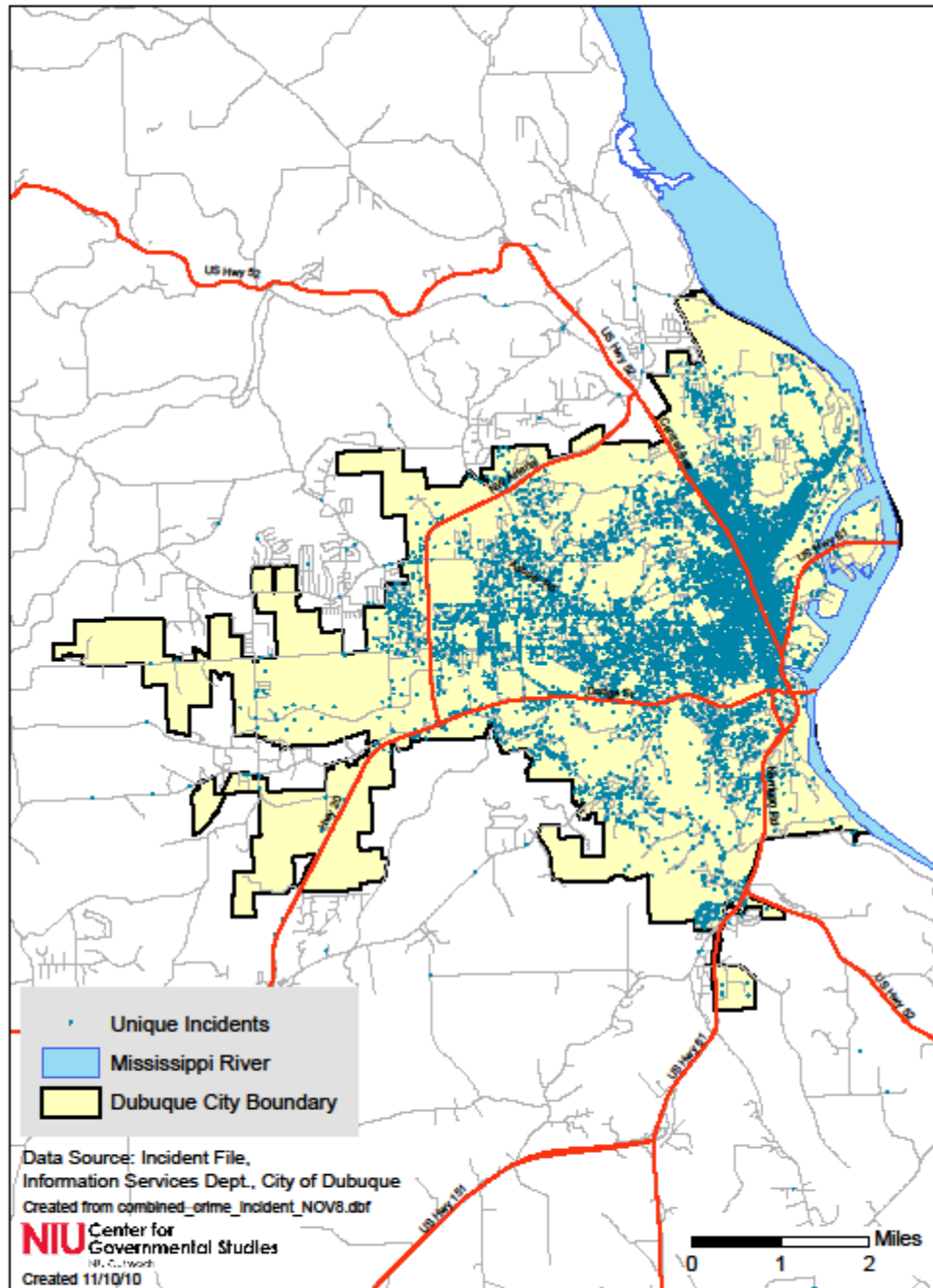
### ***Crime Incident Mapping***

The Dubuque Crime Incident Map shown below provides a spatial analysis of the location of unique crime incidents from 2006 to 2009. This map was prepared by geo-coding the records provided by the City’s Information Services Department. The maps depict the location of unique crime incidents for the years 2006 to 2009. The maps for the individual years can be found in the full report. The spatial analysis shows incidents scattered throughout the City for each of the years in addition to a general

<sup>5</sup> <http://www.merriam-webster.com/dictionary/complainant> (accessed December 9, 2010).

concentration in the eastern half of the City's geography. A closer review of the mapping indicates that for unique incidents (2006 to 2009), the concentration of incidents in the eastern part of the City tend to fall within an area along Central Avenue and north of Dodge Street. (See map the follows ES-Map 2)

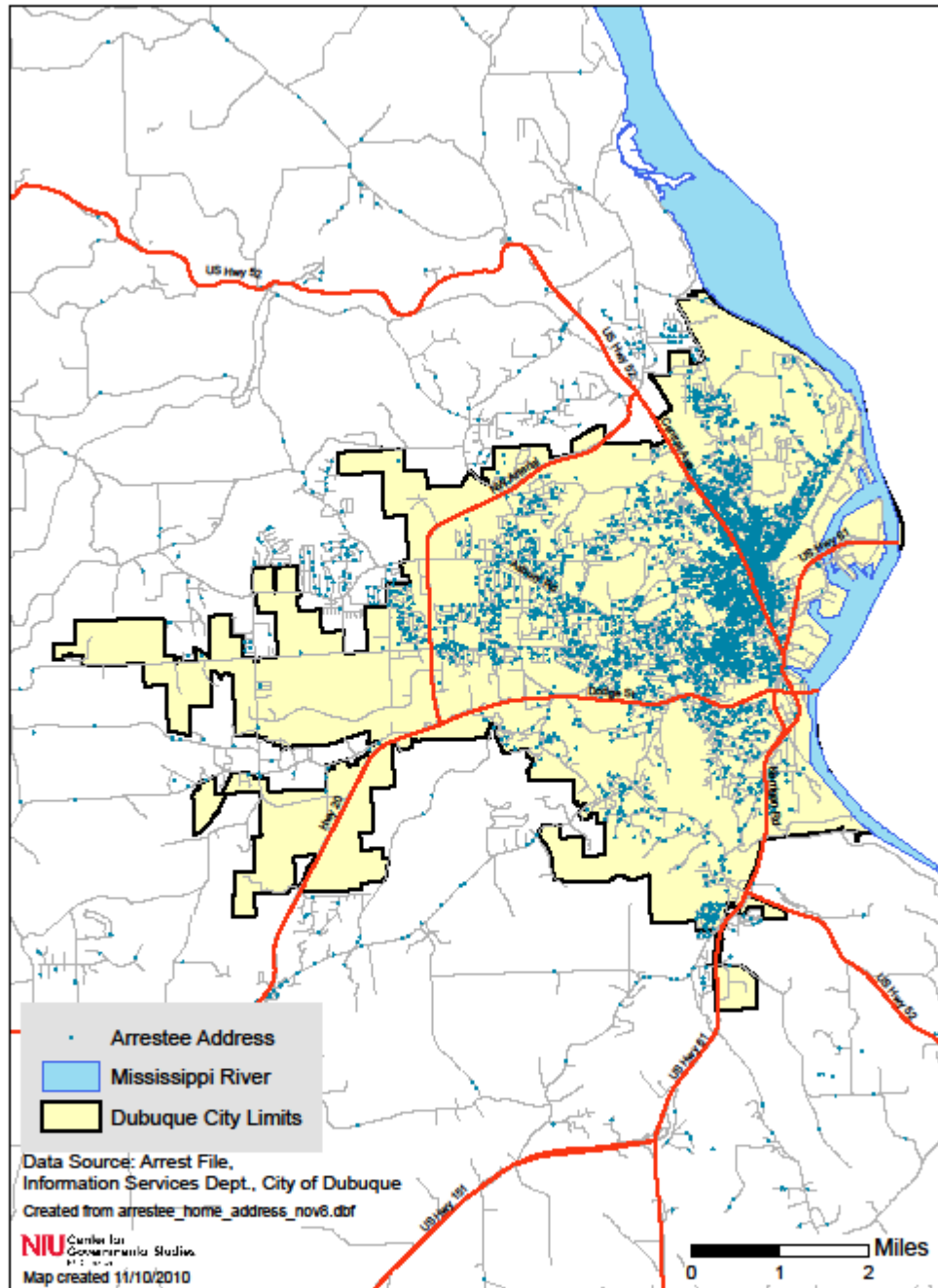
## Distribution of Unique Crime Incidents 2006-2009



### ***Arrest Mapping***

The Dubuque Arrest map that follows shows the distribution and concentration of home addresses of arrestees from 2006 to 2009. This summary map was prepared by geo-coding the file provided by the City's Information Services Department. The map depicts the home address of the arrestee (as reported) for the years 2006 to 2009. The maps for each of the years 2006 through 2009 (see Appendix) indicate that the addresses of arrestees are dispersed throughout the City. The spatial analysis does depict a more notable concentration of arrestee home addresses in the eastern part of the City. Again, following the pattern found in the Crime Incident records, home address of all arrestees for 2006 to 2009 portray a concentration in the eastern part of the City, along Central Avenue and north of Dodge Street. (See Map that follows ES-Map 3)

## Reported Home Address of Arrestees 2006-2009

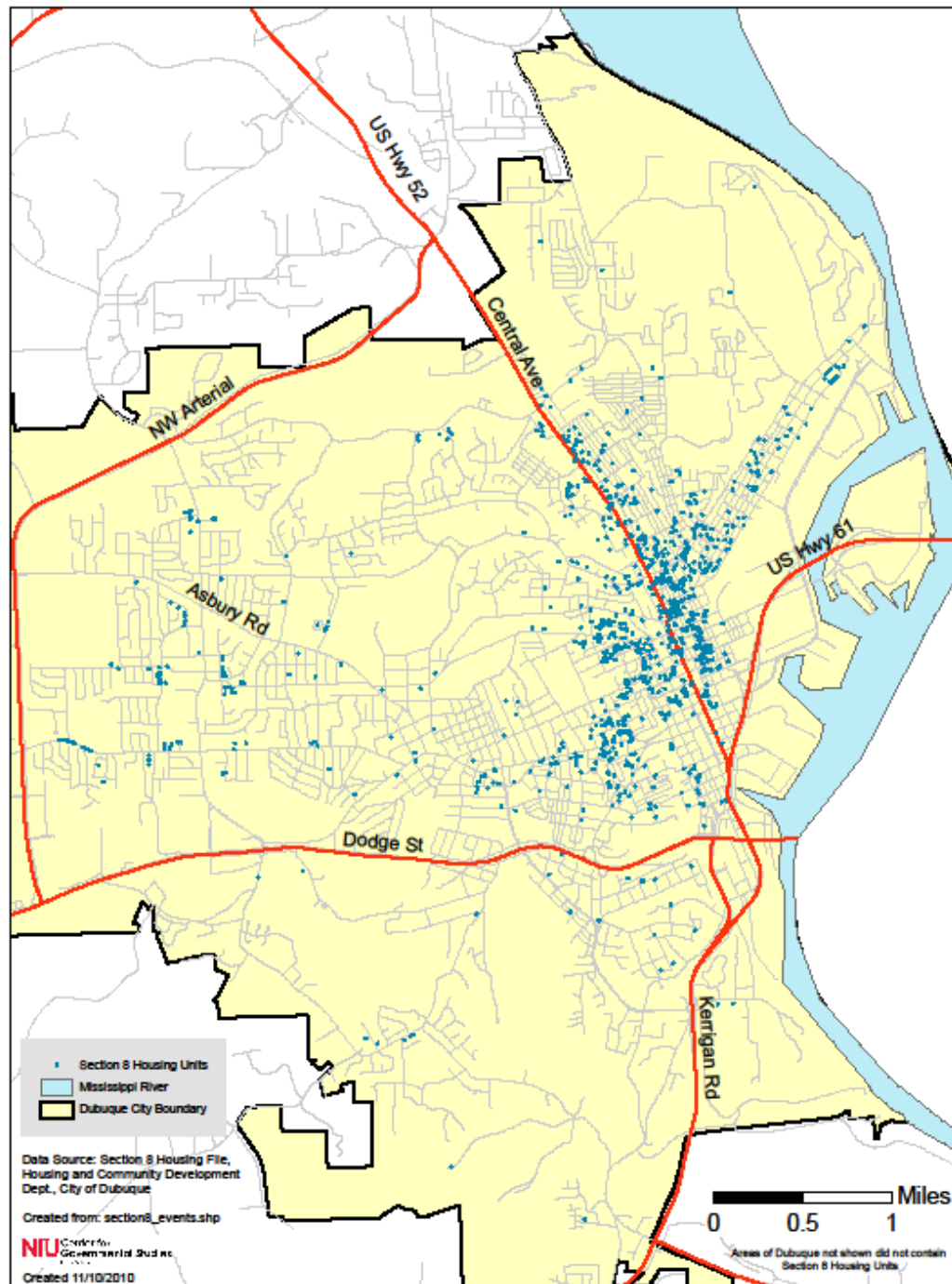




### ***Authorized Section 8 Housing Mapping***

The Dubuque Authorized Section 8 Housing map that follows depicts unique Section 8 Housing addresses obtained from the City's Housing & Community Development Department data base. This map shows the distribution of authorized Section 8 housing for each of the years 2006 through 2009. The aggregated block group maps (see Appendix) show that there is a general concentration of authorized Section 8 housing in the eastern part of town indicating a pattern that tends to parallel sections along Central Avenue. (Note: the 2006-2009 map depicts all occupied Section Housing Units for those four years, if occupied for one month or more, per the records provided). While the map depicts Section 8 units "occupied", participants may move in and out creating vacancies at times (also referred to as turnover in the analysis). This turnover could result in more units available than households or vouchers. Conversely, there are also voucher wait lists at times. Thus, there may also be scenarios where vouchers and households exceed the number of units available. (See Map that follows ES-Map 4)

## Section 8 Housing Units Occupied 2006-2009



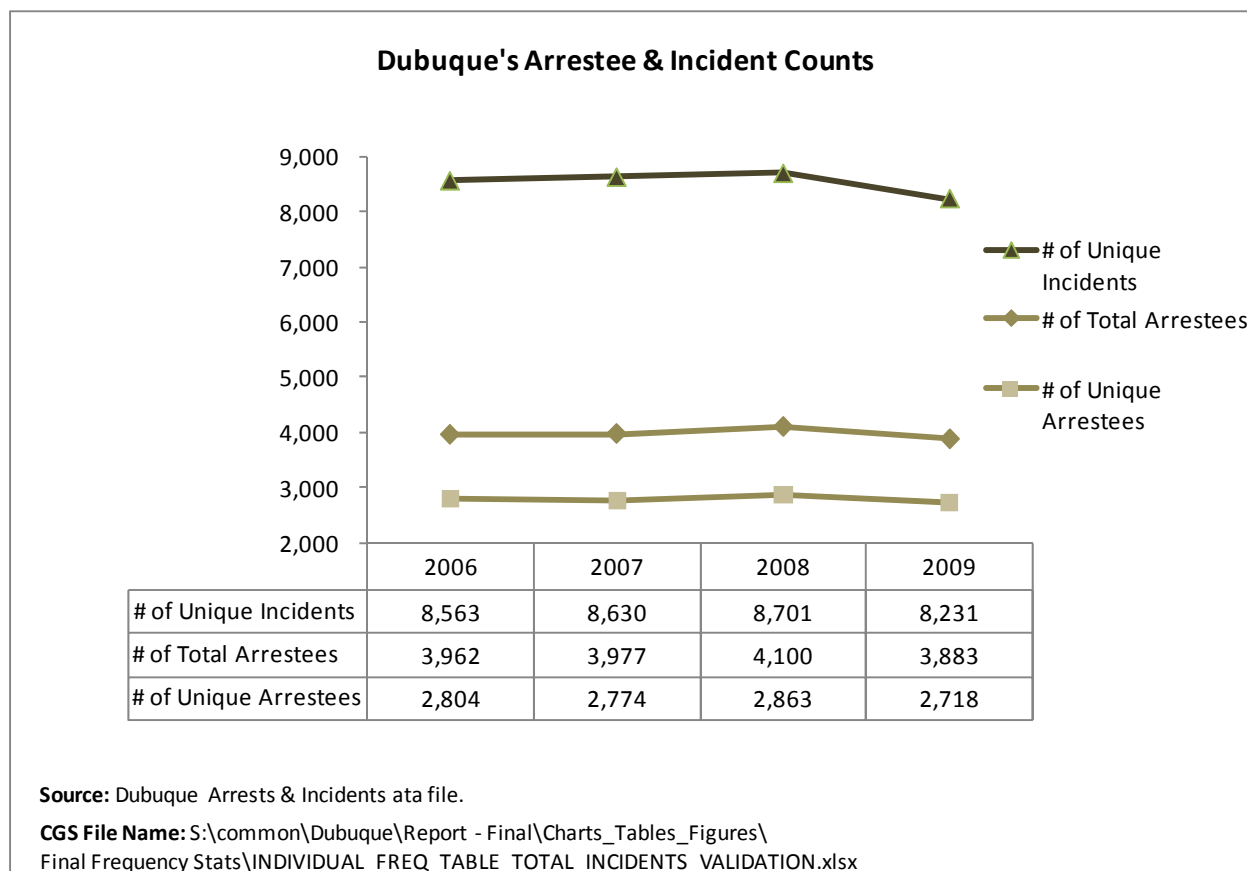
### ***Frequency Analysis of Dubuque's Crime and Arrest Data***

In order to conduct an analysis of the patterns of crime and arrest in Dubuque, the study team requested electronic copies of key records and files kept by the City as part of their public safety records and housing program records. The records were transferred in a secure environment between the organizations and analytical protocols were employed to convert or protect certain information in the files. In total, over 300,000 individual records from crime incident, arrest and housing program files were received. It should be further noted that juvenile arrests were not included in the files sent (except for juveniles charged as adults) which will create differences in statistics tracked internally by the City, including the reporting of arrests within the statistical section of the City's Comprehensive Annual Financial Report (CAFR).

For the timeframe of 2006 through 2009, Dubuque arrested about 15,900 people (exclusive of juvenile arrests per the exception above). Refer to the chart below for an illustration of total arrest trends compared to unique arrest trends. Unique offenders are unique for each year reported but could have been arrested in either previous or subsequent years and could have been arrested multiple times. In addition, it is important to recognize that where the analysis refers to Section 8 participation, the data represents only *authorized* Section 8 cross-matching, (using the data analysis protocols listed in this section) and should not be inferred to include non-authorized persons who may be associated or implicated in Section 8 crime incidents or arrests. *It is important to note that there could be overlap in the arrestees, victims and complainants. For instance, it is possible for a complainant to also be a victim and/or an arrestee.*

Dubuque experienced an increase in incident and arrestee (unique and total) counts from years 2006 to 2008, but these trends were reversed in 2009 when the counts began to drop. Not only did the counts drop in 2009, but they dropped below 2006's figures.

**ES-Image 3: Dubuque's Arrestee and Incident Trends: Years 2006 to 2009**

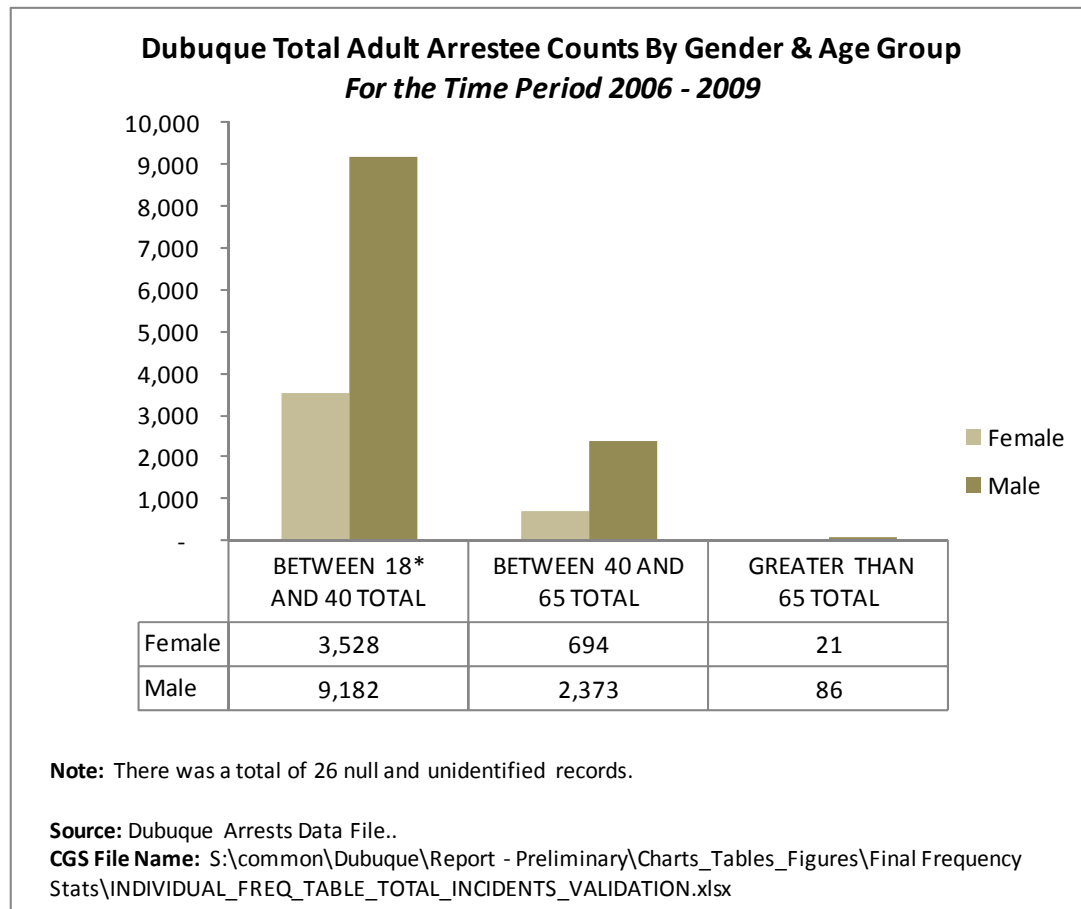


Note 1 – Figures here were obtained from Dubuque's arrestee data file and are exclusive of juvenile arrest counts, with the exception of a few juveniles charged as adults.

Note 2– Each incident event with multiple arrestees, victims or individuals involved is counted once. Also, Incidents presented in this chart only include events with associated arrestees, victims or victims' businesses, complainants and other involvements (i.e., accident drivers, business owners or vehicle passengers associated with the accidents, businesses, cited persons, deceased persons, missing persons, owners of vehicles or property involved, pedestrians and other individuals impacted by the event) – referred to involvement records. Individuals such as adult or juvenile suspects and witnesses are not included in this data. Those incidents containing additional records pertaining to juveniles, witnesses or suspects were adjusted to exclude the witnesses and/or suspects associated with the incident. For example, incident A has one arrestee, two victims and one witness. The record of this witness is dropped from this data set and Incident A is counted as ONE incident for this incident count table. Given another example, Incident B has one Juvenile suspect and has no arrestees, no victims and no other individuals involved. Incident B is not included in this data set.

In terms of adult arrests that took place during the period 2006 through 2009, CGS identified more male arrestees (9,182) than females (3,528) in the data, with the majority of the males within the age group “between 18 and 40” years old (see the following chart).

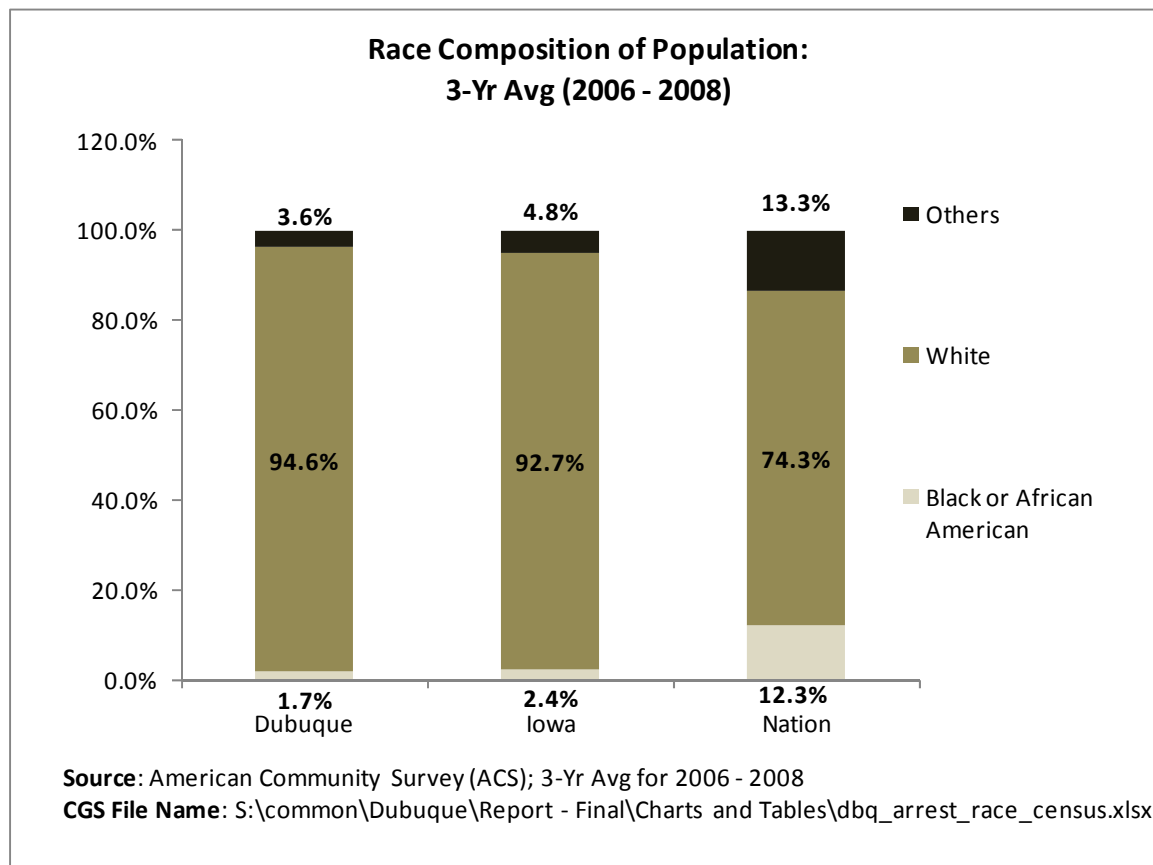
**ES-Image 4: Age and Gender Composition of Dubuque’s Adult Arrestees**



\* Figures here are exclusive of “juvenile arrest” counts. While juveniles are defined as individuals under the age of 18, there are some arrestees younger than 18 but charged as adults (deemed “adult arrests” which are included in these “adult arrestee” counts.

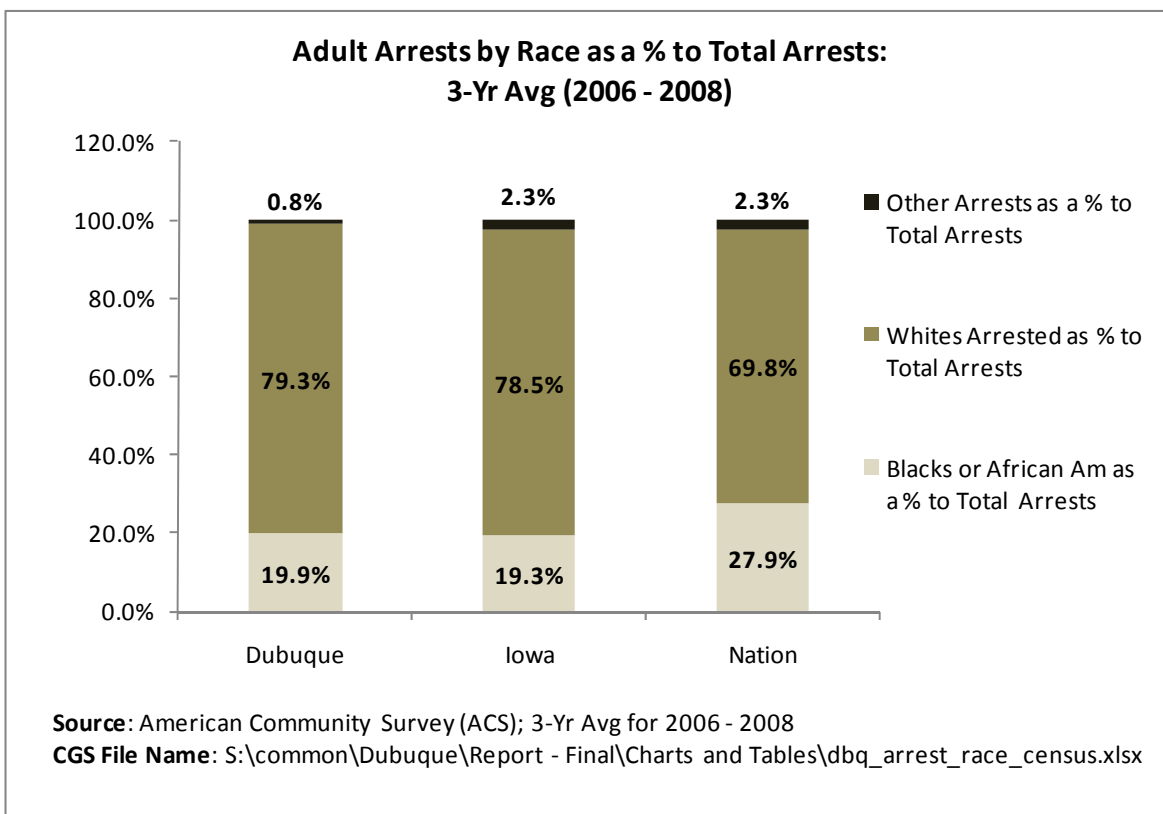
The chart below depicts the breakdown of the City's, State's and Nation's population by race (based on a 3-year average from 2006 to 2008). Per the American Community Survey's 3-year average (2006 to 2008), Dubuque has a higher percentage population of "White" residents than the State or the Nation, with a lower balance of "Other" races or "Black or African American" residents compared to the State and the Nation – though Dubuque's race compositions are somewhat comparable to the State.

**ES-Image 5: Race Composition of Dubuque's Population Compared to Iowa's and the Nation's Race Compositions (3-Year Average)**



Illustrated in the chart below is the race composition of adult arrestees (arrestees by race as a percent to total arrestees) on a comparative basis: Dubuque compared to Iowa's rate and the Nation's rate of arrestees. Dubuque and the State have similar arrest compositions, with Dubuque's arrest rate of "Other" races being slightly lower than the State's (.8% compared to 2.3%, respectively). Compared to the Nation, both Dubuque and Iowa have higher arrest rates of "Whites" (79.3% - Dubuque; 78.5% - Iowa; and 69.8% - Nation) with lower arrest rates of "Black or African Americans" and "Others."

**ES-Image 6: Adult Arrests by Race as a Percent to Total Arrests (3-Year Average)**



Note – Figures here are exclusive of juvenile arrest counts, with the exception of a few juvenile arrests that were included in the file forwarded by Dubuque to CGS.

Table 14 represents the figures used for the analysis in this section comparing *authorized* Section 8 participants to non-Section 8 participants (arrestees, victims and complainants; unique vs. total). The data protocol used for the analysis in this section is important to note here.

The data protocol rule that applied to determine *authorized* Section 8 participants is as follows:

Each person within the *Merged Incident & Arrest Data File* contains a unique identification number based on a unique ID number (SSN) or other identification

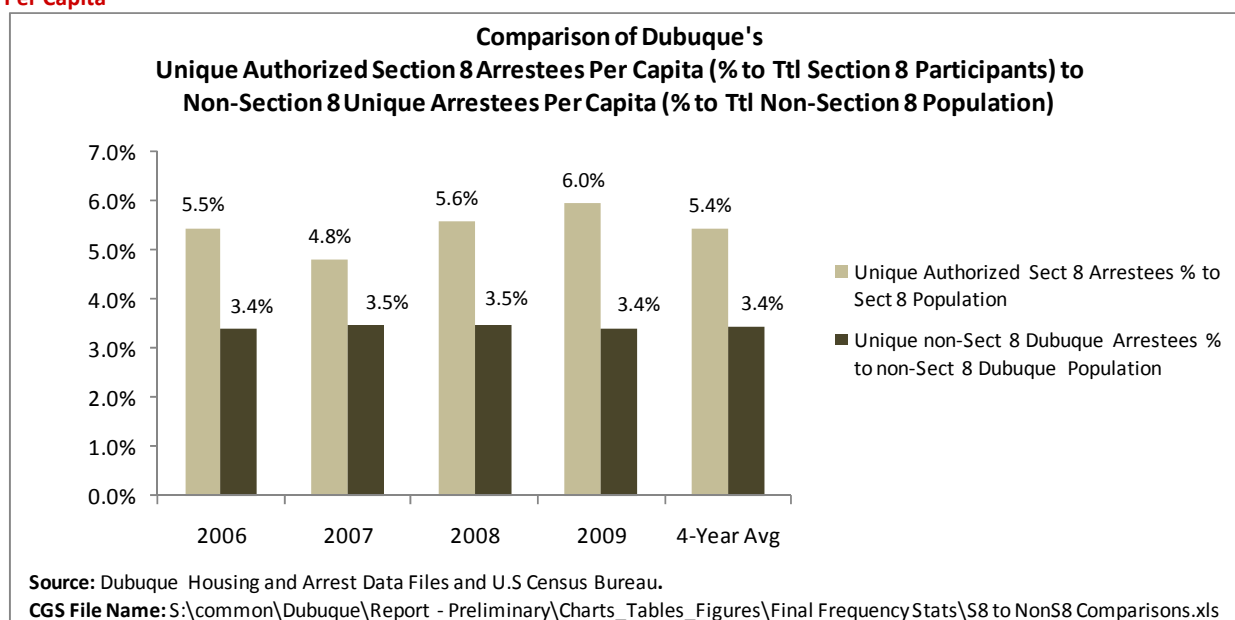


assigned by Dubuque Police Department (i.e., Name Number). This data was then converted, in a secure environment, to a unique identification number for each arrestee, victim, and complainant or authorized housing program participant. This unique identification number from the crime files (arrestee, victim, and complainant) was compared to the unique identification number given to authorized persons contained in the housing data file. If an identification number for a given arrestee, victim or complainant within the *Merged Incident & Arrest Data File* matched an identification number contained in the *Housing "In and Out" Participation Data File* AND the incident event date *Merged Incident & Arrest Data File* matched the authorized Section 8 participation time frame (e.g., arrest occurred January 2, 2007 and individual was listed as an authorized participant from December 15, 2006 through July 31, 2008) in the *Housing "In and Out" Participation Data File*, then the arrestee, victim and/or complainant was deemed to be an authorized Section 8 participant arrestee, victim and/or complainant. It is understood that individuals from time to time switch addresses within the Section 8 program, thus this rule will account for the individual based on their identification regardless of the address given.

The CGS study team recognizes that there are weaknesses in this data and cautions the reader of this analysis to recognize that the results and findings can be limited by a variety of factors in the data that are not easily resolved including the following: individuals falsifying information, giving wrong or misleading addresses and/or errors in record keeping (e.g., providing or recording incorrect SSN's or other identifications), or lag time in data entry. Thus, there are limitations to the analyses presented here. Furthermore, subsequent analyses of crime incident data, arrest data, victim data or Section 8 data that attempts to assess the impact or involvement of *non-authorized* Section 8 participants may produce different results. It should also be noted that the analyses that include *authorized* Section 8 participants concurrently represents, by definition, a proportion of the population living near or below the poverty level.

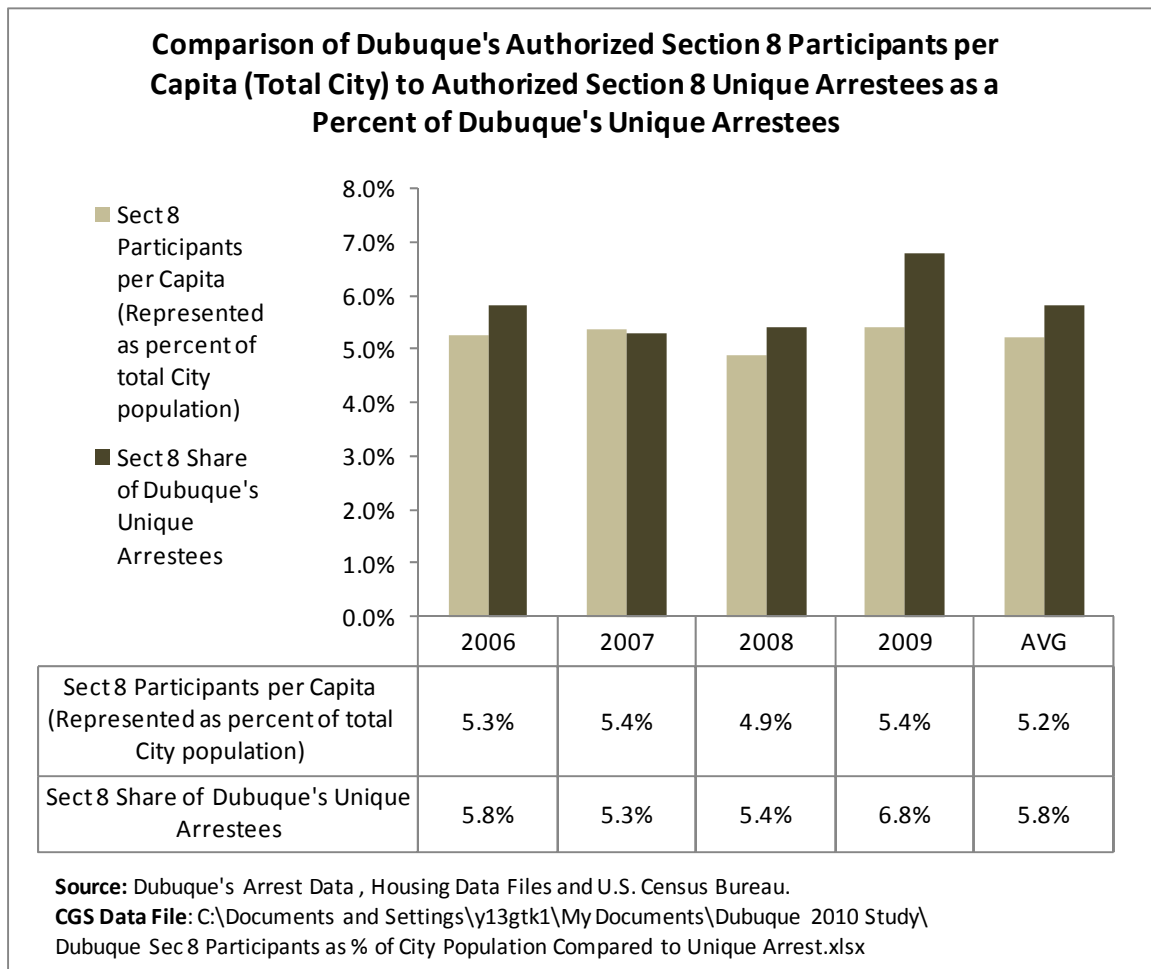
The data in the following chart illustrates the relative arrestee rate of persons arrested by Dubuque Police for the time period of 2006-2009. The data tabulates unique arrestees and compares the unique arrestee ratio of non-Section 8 program arrestees to the non-Section 8 population against the unique arrestee ratio of authorized Section 8 program participant arrestees to the total authorized Section 8 population in Dubuque. As the data in following chart indicates, on average, unique arrestees within the authorized Section 8 population experienced a higher ratio of arrests within their population group (5.4%) than did the non-Section 8 arrestees within the non-Section 8 population (3.4%) during the period that was examined.

**ES-Image 7: Comparison of Dubuque's Unique Authorized Section 8 Arrestees Per Capita to non-Section 8 Unique Arrestees Per Capita**



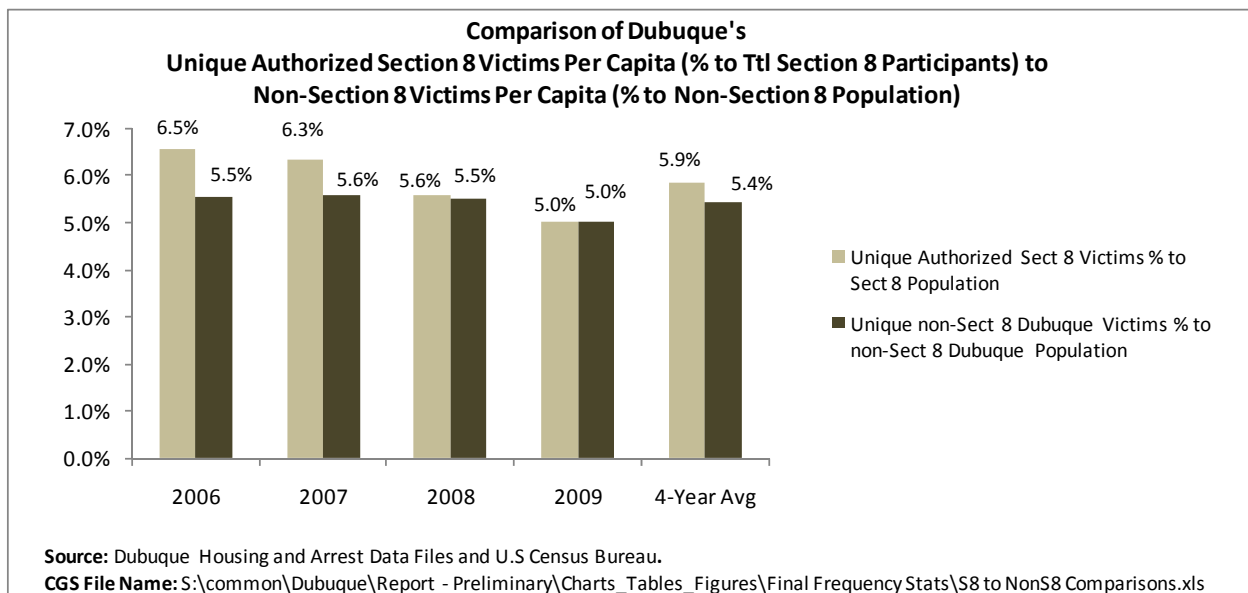
Viewing the authorized Section 8 arrest data another way (see chart below), authorized Section 8 participants, who on average represent approximately 5.2% of the City's population from 2006-2009, account for unique arrestees in the City at only a slightly higher average rate (5.8%) than the percentage of the population they represent over the time period of 2006-2009. However, it is important to recognize that this data represents only *authorized* Section 8 cross-matching, (using the data analysis protocols listed earlier in this section) and should not be inferred to include non-authorized persons who may be associated or implicated in Section 8 crime incidents or arrests.

**ES-Image 8: Comparison of Dubuque's Authorized Section 8 Participants per Capita (Total City) to Authorized Section 8 Unique Arrestees as a Percent to Dubuque's Unique Arrestees**



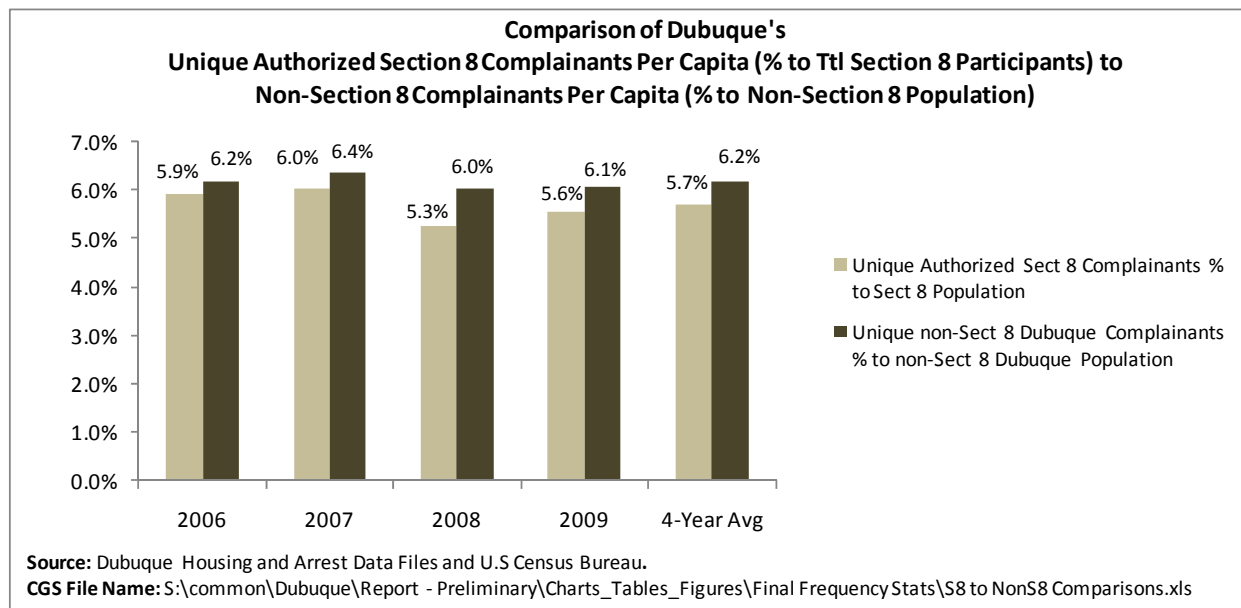
Further analysis indicates that authorized Section 8 participants, on average, had similar victimization rates as non-Section 8 residents for the same time period (2006 through 2009), with Section 8 participants having a slightly higher victimization rate than non-Section 8 residents (5.9% to 5.4%, respectively). A review of the trends below indicates the tendency for authorized Section 8 participants to be victimized was slightly higher in 2006 but leveled off to a fairly equivalent victimization rate of non-Section 8 residents beginning in 2008.

**ES-Image 9: Comparison of Dubuque's Unique Authorized Section 8 Victims Per Capita to non-Section 8 Victims Per Capita**



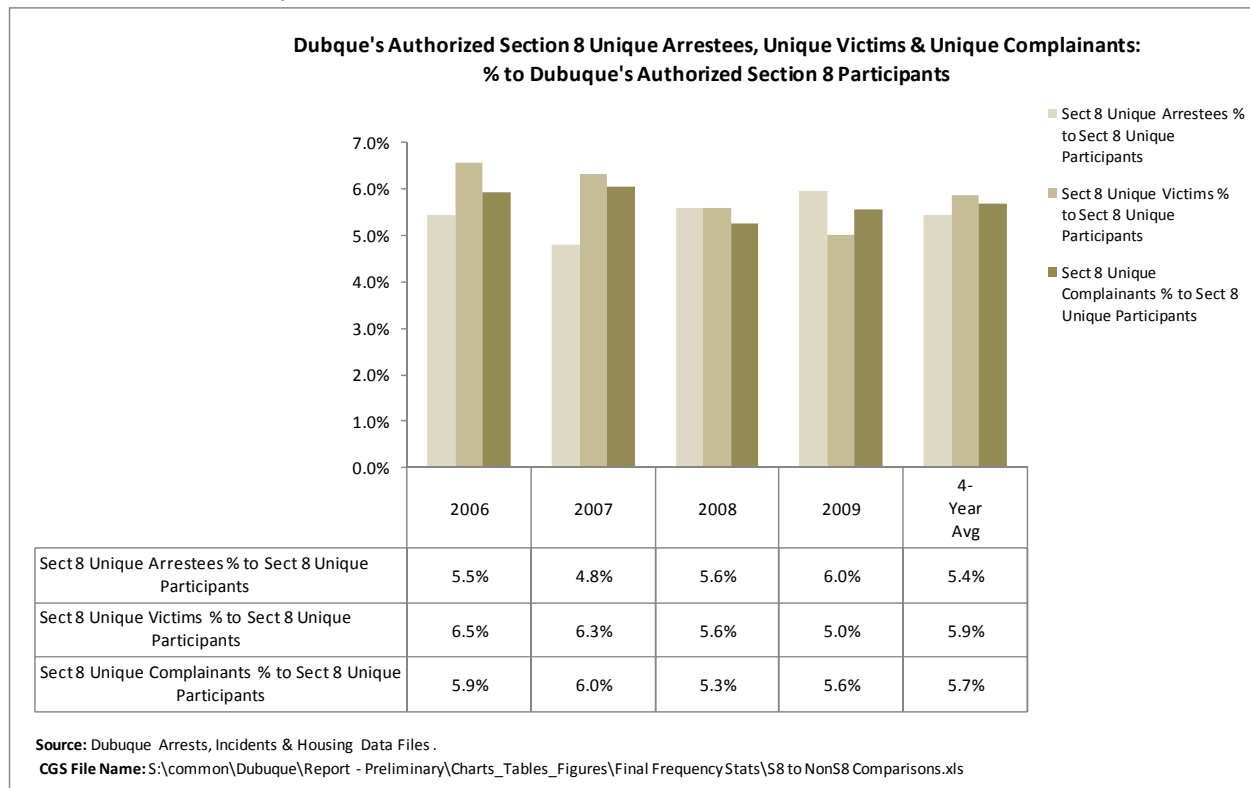
From years 2006 to 2009, the City's non-Section 8 residents experienced a somewhat higher complainant rate (6.2%), on average, than its Section 8 participants' rate (5.7%) during the same time period. See chart below.

**ES-Image10: Comparison of Dubuque's Unique Authorized Section 8 Complainants Per Capita to non-Section 8 Complainants Per Capita**



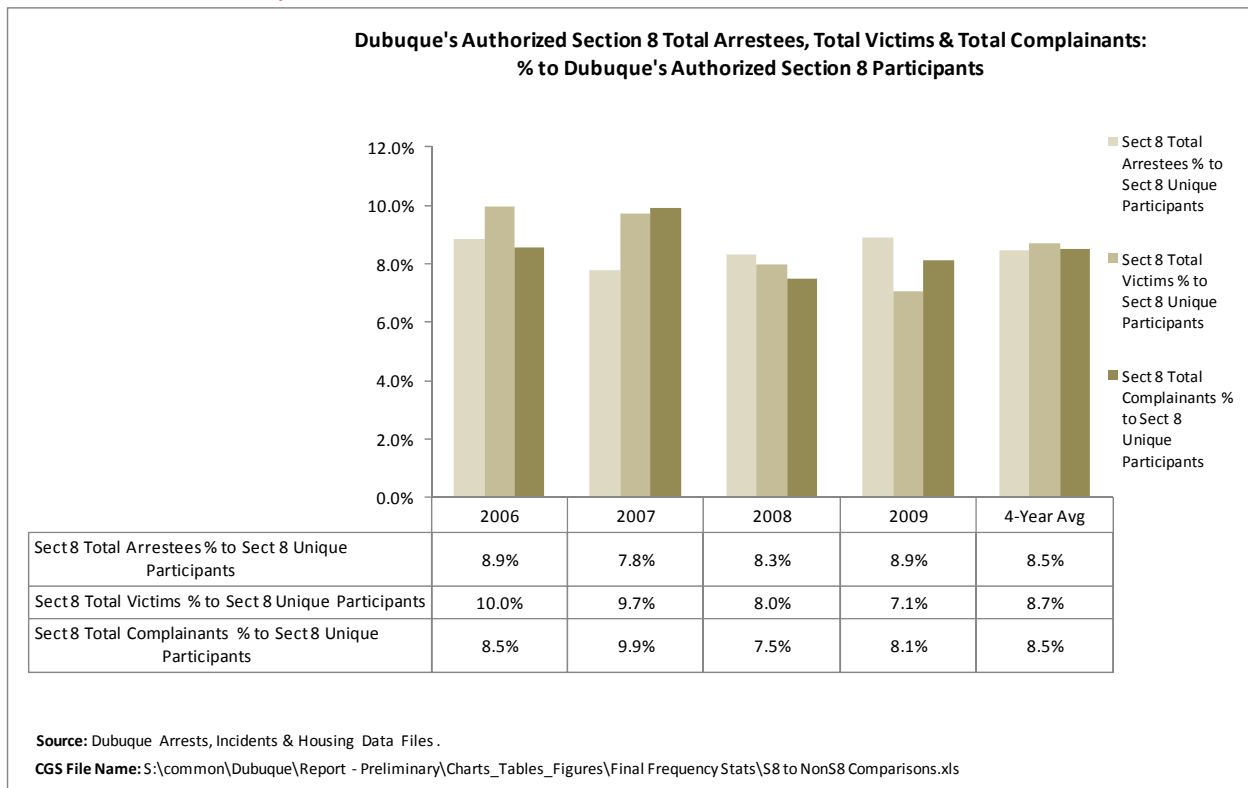
On average, as shown in the chart below, from years 2006 to 2009, authorized Section 8 participants experience somewhat similar rates of unique arrestees, victims and complainants per Section 8 participants, or per capita (5.4%, 5.9% and 5.7%, respectively). Authorized Section 8 unique arrestees per capita remained fairly flat over the 4 year period of 2006 to 2009. In 2009, authorized Section 8 unique arrestees represented 6.0% per capita, compared to 5.5 % per capita in 2006. At the same time, authorized Section 8 unique victims per capita has declined (5% per capita in 2009 compared to 6.5% per capita in 2006) and unique complainant counts decreased slightly for the same time period (5.9 % per capita in 2006 compared to 5.6% per capita in 2009).

**ES-Image11: Dubuque's Authorized Section 8 Unique Arrestees, Unique Victims & Unique Complainants: % to Dubuque's Authorized Section 8 Participants**



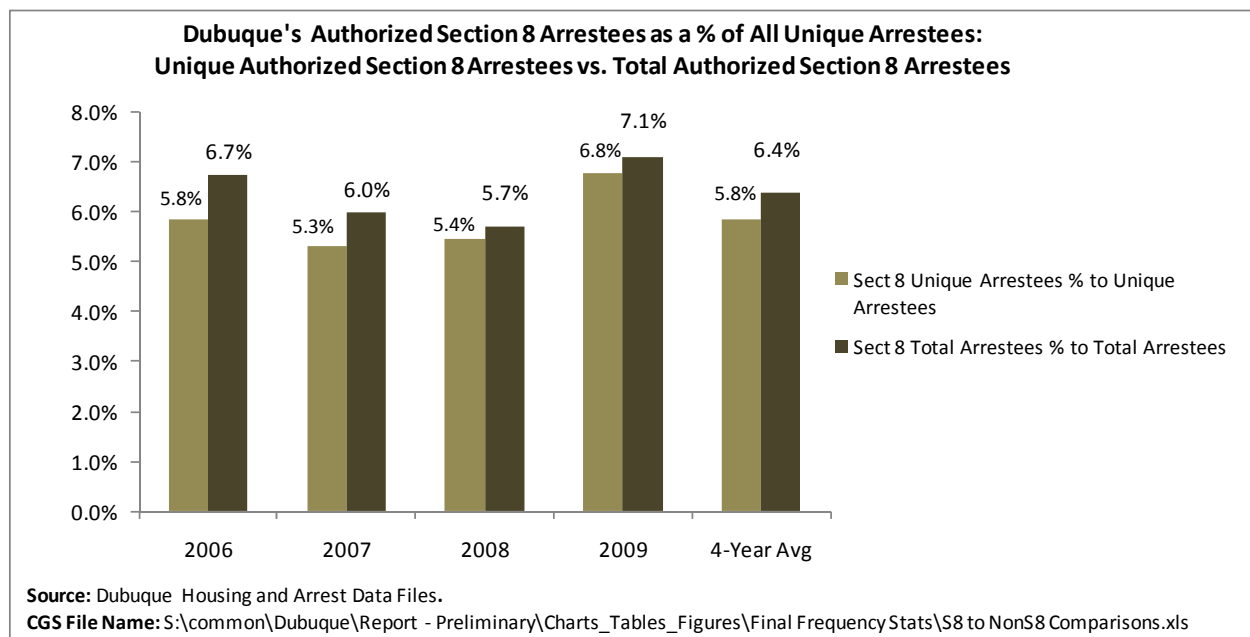
Per the following chart, total authorized Section 8 arrestee, victim and complainant rates are, on average, relatively similar to each other. Also, *total* authorized Section 8 arrestees, victims and complainants experienced similar trends as *unique* arrestees, victims and complainants; authorized total Section 8 victims decreased at a more noticeable rate from 10% (2006) to 7.1% (2009) and authorized Section 8 complainants remained fairly flat (8.5% in 2006 to 8.1% in 2009) during the time period under study. Authorized Section 8 arrestee percentage (per authorized Section 8 participants) remained the same in years 2006 and 2009 (8.9% for both time periods).

**ES-Image12: Dubuque's Authorized Section 8 Total Arrestees, Total Victims & Total Complainants: % to Dubuque's Authorized Section 8 Participants**



Lastly, the chart below depicts the percentages of Dubuque's authorized Section 8 unique arrestees as a percent of all unique arrestees in the data base from years 2006-2009 as well as total authorized Section 8 arrestees as a percent of total arrestees in the City. Total and unique arrestees follow the same trends from 2006 to 2009 but vary in their rates possibly due to increases or decreases in multiple offenders.

**ES-Image 13: Dubuque's Authorized Section Arrestees as a % of All Arrestees: Unique Authorized Section 8 Arrestees % to All Unique Arrestees vs. Total Authorized Section 8 Arrestees % to Total Arrestees**





### Section III-C: Quantitative Statistical Modeling Analysis and Spatial Analysis

#### *Loglinear Analysis of Dubuque's Crime and Arrest Data*

In order to provide a more structured assessment of the possible association of crimes, victims, and arrestees, the study team undertook a **loglinear** analysis of key variables thought to be good indicators of possible associations or interactions between phenomenon related to the prime questions being explored in the present study. The loglinear approach is a statistical tool used to identify multi-way associations between three or more variables. In loglinear analysis, there are no dependent or independent variables. Instead, the test simply looks for interactions or associations that might exist between the selected variables (for a discussion of Loglinear Analysis see Knoke and Burke's *Loglinear Models*, 1980).

To examine how or if S8 housing units are implicated in Dubuque's crime, the study team combined and coded information received from Dubuque into a Combined Crime Incident data file. This file contains only one record for each crime incident. Through data coding, the analysts captured information about the type of crime, number of victims, number of arrestees, and addresses of the incidents, victims, and arrestees. To further explain, a *crime incident*[1] is a combination of the type of crime, the location of the incident, the victim's, and the perpetrator's address. The associations among these locations tells us something about the implication of S8 addresses in the distribution of crime in Dubuque, and more generally about the associations of crime addresses in the social and economic distributions that are reflected in S8 or non-S8 address status. Since the primary focus of this report is on the implication of S8 addresses in Dubuque crime, each of the associations involving the addresses of the incident, victim, and arrestee are detailed.

The analysis is looking for interactions between variables. A positive 2-way interaction between any of the location measures implicating S8 addresses indicates that the probability of the location involving a S8 address increases if the other location variable involves a S8 address. The association indicates a greater probability than one would expect from independent, random crime, victim, and arrestee locations. If the probability of one aspect of the crimes location, say its victim, having a S8 address is increased beyond random expectation if the arrestee also has a S8 address, the pattern of crime is circumscribed, probabilistically speaking, by S8 location of the victim and arrestee.

Results of a loglinear analysis of the three location indicators show statistically significant, strong, and positive two-way associations between all three S8 categories indicating an event location, victim, and arrestee address (see Table 22 in Section III-C ). These patterns indicate that crime in Dubuque, to the extent that S8 housing units are implicated, consists of a greater proportion of shared S8 addresses among incident locations, victims, and arrestees than can be attributed to random patterns. Crime is circumscribed by mutual S8 addresses.

The distributions of 12 types of crime by S8 location and non-S8 location show that violent crimes make up nearly twice as high a percentage of crimes occurring at S8 addresses than the share reported with non-S8 addresses. (1.91 times as high for UCR-Violent crime and 1.71 times as high for non-UCR violent crime (see Table 16 in Section III-C ). The only other type of crime that occurs at a much higher proportion at S8 addresses than non-S8 addresses involves local ordinance charges; the S8 rate is over five times larger than the non-S8 rate (10.56/1.95) (see Table 16 in Section III-C ). Property crimes, DUIs, drug and alcohol related crimes, and civil disorders make up a lower proportion of the crimes at S8 locations than they do at non-S8 locations (see Table 16 in Section III-C ). The types of crime committed at S8 locations don't change much over the period 2006-2009 with one notable exception; there is a large increase in share of crimes classified as violations of local ordinances that occurred in 2008 and 2009. The distributions of crime types at non-S8 city locations are very stable over the same period (see

Table 17 & Table 18 in Section III-C).

Analysis of arrestee and victimization rates indicate that the biggest gaps between S8 residents and other City of Dubuque residents are found when one adds in the S8 “persons” who gave S8 addresses in the crime incident file but were not matched to a S8 address by personal ID in the housing file. When these S8 “persons” are added together with the official/*authorized* S8 residents, the rates of victimization are overall 1.60 times greater for S8 residents than non-S8 residents living in Dubuque; and the arrest rates for S8 residents are overall 2.49 times as high as the rates for non-S8 Dubuque City residents (see Table 19 & Table 20 in Section III-C). If these address matches are trusted at face value, city officials and S8 participants need to be aware that this “unseen” S8 population increases even higher both victimization and arrest rates for this group of citizens relying on public housing who are already at above average risk levels.

Associations exist between locations of incidents, victims, and arrestees indicating the following:

- The probability that a victim with a S8 address was victimized at a S8 location is greater than expected on the basis of randomness;
- The probability that a victim with a S8 address was victimized by an arrestee with a S8 address is greater than expected on the basis of randomness;
- The probability that an arrestee had a S8 address when the crime occurred at an S8 address is greater than expected on the basis of randomness (see Table 23– Table 25 in Section III-C).

The above associations involving Section 8 housing units implicate S8 housing in patterns of crime that circumscribe the incident & victim, incident & arrestee, and victim & arrestee locations more than random, independent processes predict. When crimes occur at S8 locations, the victims are more likely to be S8 residents than predicted by chance. When crimes occur at S8 locations, the arrestees for those crimes are more likely to be S8 residents than predicted by chance. And when victims live at S8 locations, the arrestees are more likely to live at S8 locations than predicted by chance. In sum, the pattern of interactions involving S8 address locations among incidents, victims, and arrestees is consistent with the interpretation that crime in Dubuque is probabilistically circumscribed by S8 address involvement rather than diffused across address locations.

### ***Spatial Autocorrelation Analysis***

The purposes of this analysis were to depict the extent of spatial autocorrelation (henceforth, simply referred to as spatial correlation) among crimes at the block level and to display the locations of areas with high levels of spatial correlation within the City of Dubuque. For comparative purposes, the study team selected two years of data to explore for the spatial correlation analysis. The years selected were 2006 and 2008 because of the completeness and quality of the incident data for these years. The visual depiction of the results can be found in the accompanying maps.

Generally, the analysis indicates that the level of spatial correlation of blocks' crime rates overall is low to moderate in Dubuque. The crimes exhibiting the higher levels of spatial dependency were UCR Violent, Civil Disorder, and Drugs & Alcohol. UCR Violent and Non-UCR Violent crimes appeared to diffuse, especially in downtown blocks: some blocks with low or average rates of violent crime in 2006 that neighbored blocks with high rates became blocks with higher than average rates in 2008. UCR Property crimes, in the downtown area, exhibited the opposite tendency, to become more average when neighboring blocks with high rates in 2006.

Spatial autocorrelation analyses are not as robust as temporal or cross-sectional correlation analysis. Before assumed definitive, the results presented here should be compared to other results with different specifications. Furthermore, explanation of crime patterns across geographical areas should also take into account the social and economic characteristics of those areas along with any spatial dependence before firm conclusions are drawn. Because of the relatively small population counts in block areas, detailed demographic information about residents in those areas is not available. The units of analysis in this statistical exercise began with complete data set of crime incidents. Those incidents were aggregated up to the census block level for each of the 1085 census blocks in Dubuque. Using the Combined Crime Incident analytical file that contains the census block identifier, the geocoded latitude and longitude location of each unique crime incident, the type of crime (coded by CGS staff into 12 ranked categories), and the year the incident took place, the study team then analyzed the crime incidents by census blocks to examine the spatial correlation. For each block and year, the numbers of 12 types of crimes occurring in each census block were tabulated. These crime count variables became the focus variables of the spatial correlation analysis. Analysis was conducted on the following types of crime counts aggregated by blocks:

- UCR Violent
- UCR Property
- Non-UCR Violent

- Non-UCR Property
- Civil Disorder
- Drugs & Alcohol Related Crime

From the measures of the local Moran I, maps are generated that characterize every census block as one of four types:

#### High Value - High Neighbors

A block with a high standardized crime count ( $> 2$ ) – meaning the block's value on the standardized crime variable is more than 2 standard deviations above zero, the average standardized crime score for all blocks, and the block is connected to neighboring blocks with similarly high standardized crime counts.

#### Low Value – Low Neighbors

A block with a low standardized crime count ( $< 2$ ) – meaning the block's value on the standardized crime variable is more than 2 standard deviations below zero, the average standardized crime score for all blocks, and the block is connected to neighboring blocks that have averaged standardized crime counts that are similarly 2 standard deviations below the mean value of crime.

#### High Value – Low Neighbors

A block with a high standardized crime count ( $> 2$ ) – meaning the block's value on the standardized crime variable is more than 2 standard deviations above zero, the average standardized crime score for all blocks, and the block is connected to neighboring blocks that have averaged standardized crime counts more than 2 standard deviations below the average.

#### Low Value – High Neighbors

A block with a low standardized crime count ( $< 2$ ) – meaning the block's value on the standardized crime variable is more than 2 standard deviations below zero, the average standardized crime score for all blocks, and the block is connected to neighboring blocks with standardized crime counts that average more than 2 standard deviations above the mean crime count.

### **UCR Violent Crime**

The UCR violent crimes of aggravated assault, murder, rape, and robbery exhibit a relatively high level of spatial dependence. Many if not most of the downtown area blocks are classified as High Value – High Neighbor types of blocks (n=86 in 2006 and n=118 in 2008). The spatial pattern in 2008 shows a slightly expanded area of blocks of this type than appears in 2006, indicating some diffusion of these

most violent types of crime to adjacent areas. There are also a few more blocks in 2008 with higher than average UCR violent crime rates connected to neighboring blocks with lower than average violent crime than appeared in 2006 ( 18 v. 8). Most of these blocks are located in the center of Dubuque's geographical area but west of downtown.

### ***UCR Property Crime***

These serious property crimes of arson, auto theft, burglary, and larceny show less spatial dependence and less clustering than did UCR Violent crime. For these crimes, the number of blocks with above average levels connected to neighboring blocks with above average levels numbered 42 in 2006 and 40 in 2008. The clusters and outlier blocks in the southern and northwestern portions of the city were similar in 2006 and 2008. In the downtown and northeastern areas of the city, the spatial distribution of UCR property crime appeared more average in 2008 than it did in 2006 when more blocks were more likely to be classified as high-high clusters or high-low outliers.

### ***Non-UCR Violent Crimes***

These types of crimes exhibit the weakest spatial dependence of any of the crimes examined. Again, blocks designated as belonging to the High Value – High Neighbor are the modal type for those blocks fitting into one of the four types. We also observe 12 blocks in 2006 and 18 blocks in 2008 with above average Non-UCR Violent crime rates with below average neighboring blocks. We also note that the number of blocks with above average Non-UCR Violent crime increased from 2006 to 2008 of both types, those neighboring higher than average blocks and those neighboring lower than average blocks.

As did UCR Violent crimes, the Non-UCR Violent crimes appear to involve more blocks at higher levels in 2008 than 2006 diffused somewhat more into neighboring blocks, particularly in the south and southwest areas of the downtown.

### ***Non-UCR Property Crimes***

These types of crime show a lower level of spatial dependence among the types of crimes examined. The most common clustering again is of blocks into the High Value – High Neighbor clusters; and the number of these blocks so clustered increased from 55 in 2006 to 92 in 2008. In the west areas of the city, there is some evidence of spatial diffusion of these types of crimes from 2006 to 2008: 2006 blocks with above average crime levels neighbored by blocks with average or low levels of crime

became, in 2008, blocks with high crime neighbors. There is some expansion of the number of high crime blocks with high crime neighbors in the southern part of downtown.

### ***Civil Disorder***

These types of crimes, along with UCR Violent crimes, display the most pronounced spatial dependencies of the crimes analyzed. The large numbers of blocks with above average levels of civil disorder neighbored by other blocks with high levels of civil disorder are concentrated in the central and southern downtown areas (100 such blocks in 2006, 106 in 2008). Interestingly there are a substantial number of downtown blocks with neighboring blocks having high levels of civil disorder that themselves have low levels of disorder (n=33 in 2006 and n=36 in 2008). The spatial distribution of civil disorder seems to implicate adjoining blocks; there are few instances of blocks with high rates of civil disorder neighboring blocks with low rates (n=10 in 2006 and 2008).

### ***Drugs and Alcohol Crimes***

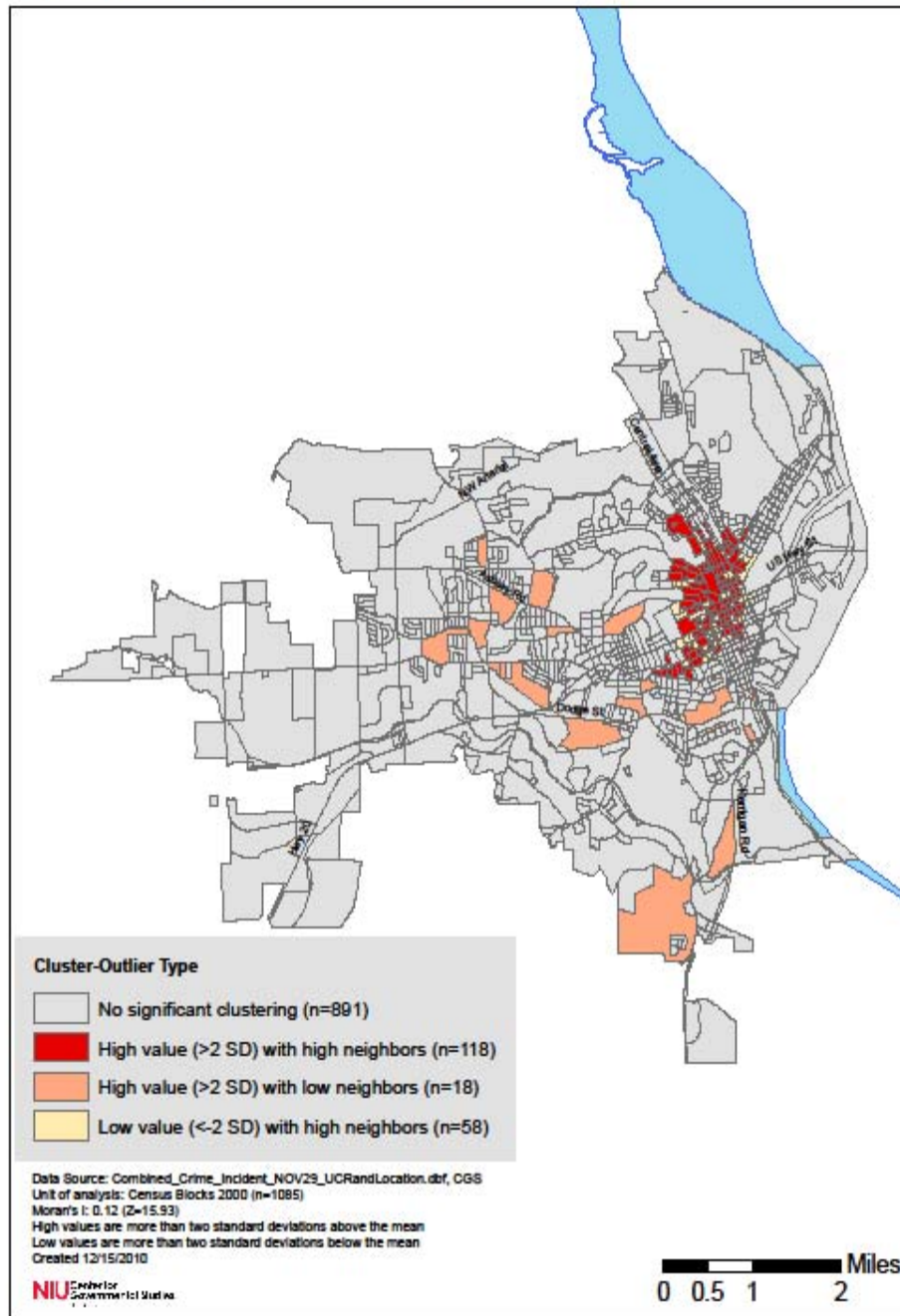
These crimes, as did civil disorder and UCR Violent crime, show higher levels of spatial correlation. Nearly all of the blocks implicated spatially are classified as blocks with high levels of crime connected to neighboring blocks with equally as high average levels. Nearly all of these blocks are located downtown, and the number of blocks like this expanded between 2006 (n=89) and 2008 (n=103). All but one of the newer blocks added to this type of cluster were in the downtown area and neighboring blocks with high drug and alcohol crime levels in 2006.

Table 27 summarizes the results of the spatial correlation analysis conducted on six crimes comparing the spatial correlations for the data sets from 2006 and 2008. Samples of the spatial results are presented below. The full presentation of the data and maps can be found in Section III-C of the Report.

#### ***UCR Violent Crimes Spatial Correlation Maps***

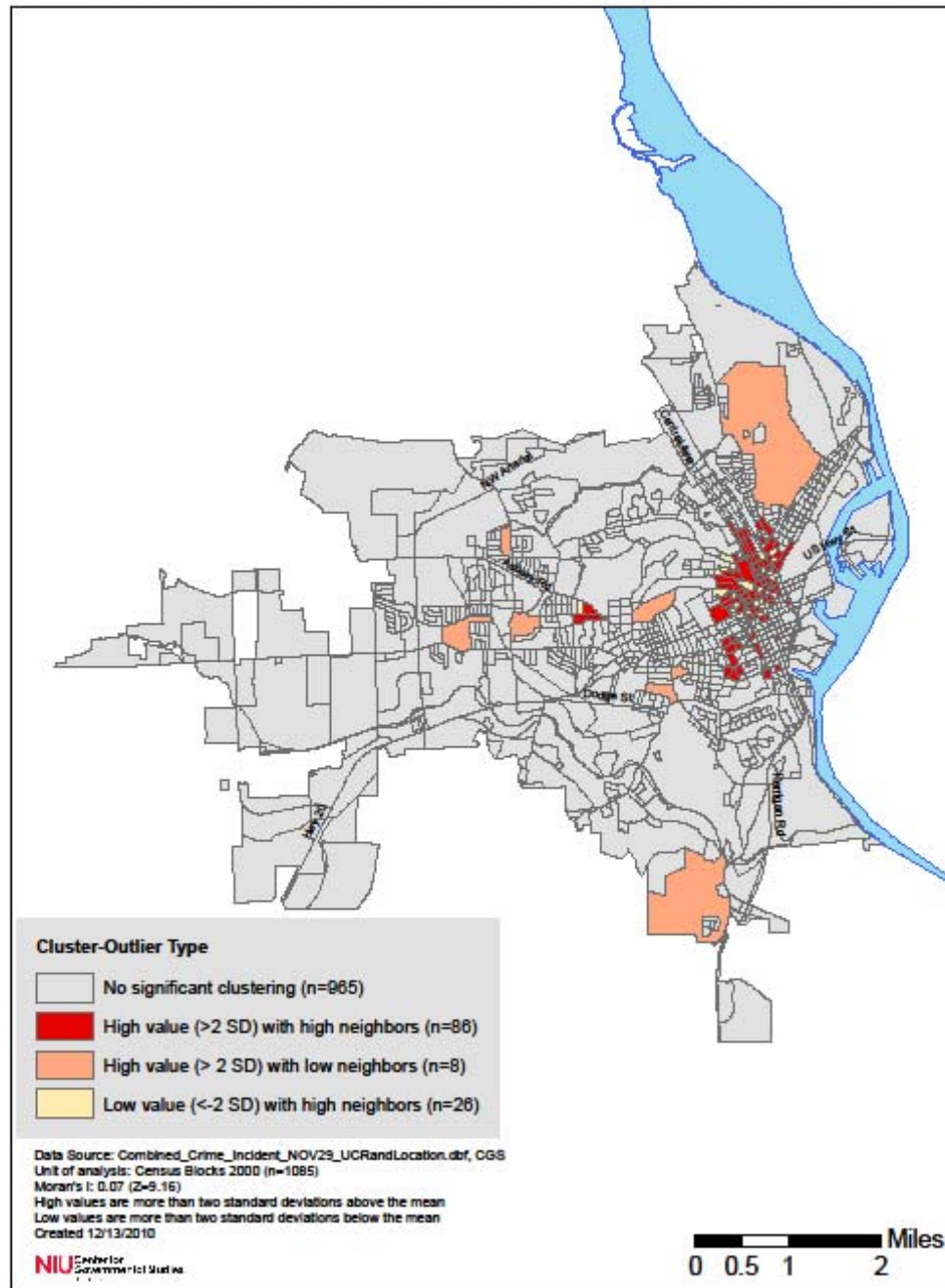
The UCR violent crimes of aggravated assault, murder, rape, and robbery exhibit a relatively high level of spatial dependence. Very similar to the Non-UCR Violent Crime clustering, the UCR violent crimes are primarily clustered along Central Avenue, south of 25<sup>th</sup> to 16<sup>th</sup>, though some scattered blocks as far south as Emmett also have High value high neighbors. (See Maps that follows ES-Map 5 and 6)

## Spatial Correlation of 2008 UCR Violent Crimes





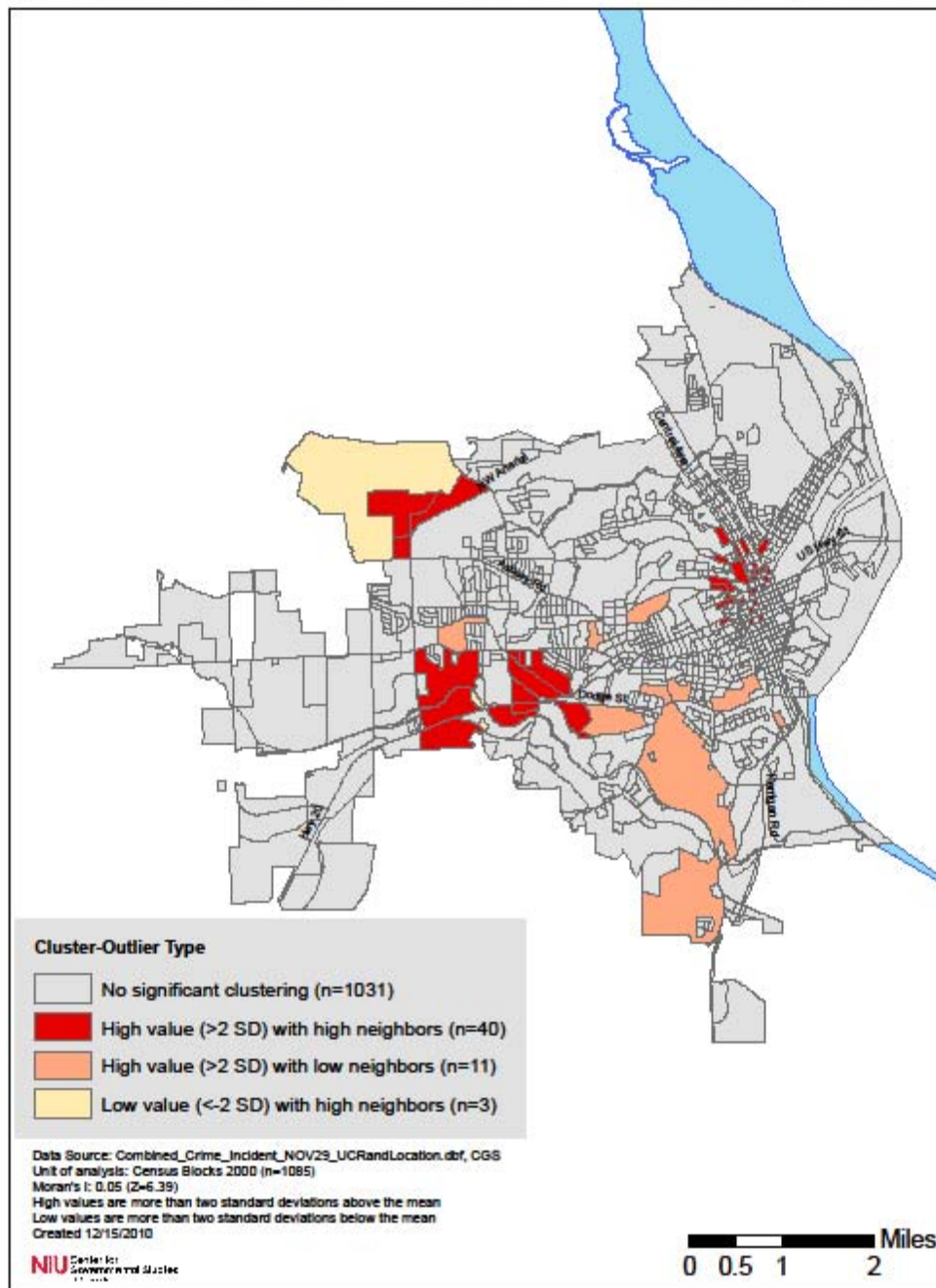
## Spatial Correlation of 2006 UCR Violent Crimes



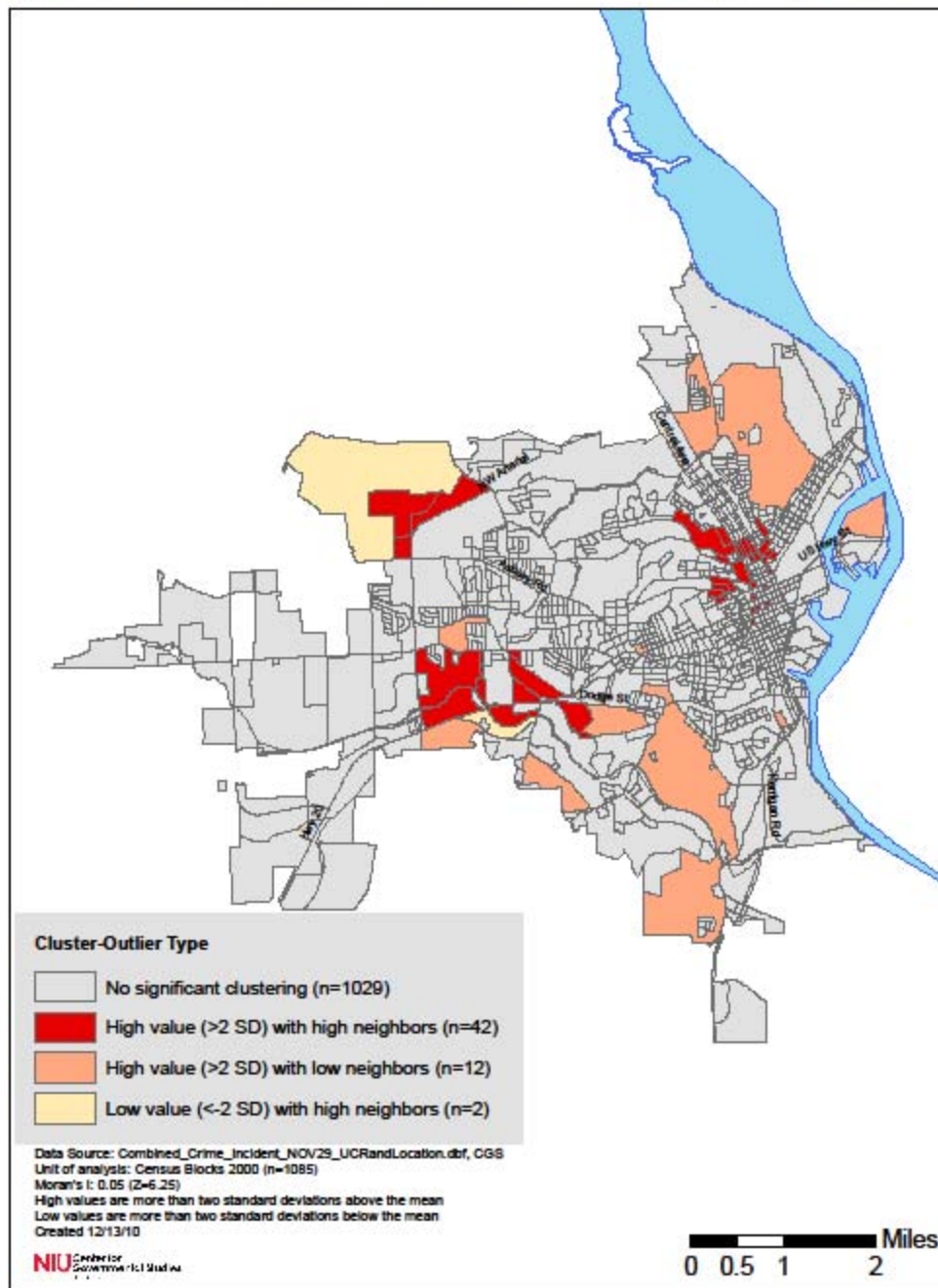
### UCR Property Crime Spatial Correlation Maps

These serious property crimes of arson, auto theft, burglary, and larceny show less spatial dependence and less clustering than did UCR Violent crime. Like the Non-UCR Property Crime, the High value high neighbors' blocks of UCR Property Crimes are clustered in three areas. The most number of such blocks are again along the Central Avenue corridor, west of the street between Primrose and Valeria and east of Central along 24<sup>th</sup>. The second largest clustering is in the south along Dodge, between Dodge and Brunswick. The third cluster is in the northwest part of the City, along Arterial and Plaza. (See Maps that follows ES-Map 7 and 8)

## Spatial Correlation of 2008 UCR Property Crimes



## Spatial Correlation of 2006 UCR Property Crimes



## Analysis of Crime and Section 8 Hotspots in Dubuque

Hotspot analysis is a useful, summary descriptive analysis to increase understanding of the patterns of concentrated distributions of crime in spatial areas. It is not designed nor is it capable of explaining those distributions. Causal attributions about the role of Section 8 housing are not warranted based on the analysis presented here and in Section III-C.

The summary of the hotspot analysis that follows depicts the extent of spatial overlap of geographical concentrations of various types of crime and concentrations of Section 8 housing units in the City of Dubuque. Concentrations of crime in space are termed “hotspots” and there are various analytical tools used to find these hotspots, and all require user defined assumptions that can alter the results.

Please note: the results reported here are conditional on the specifications the statistician imposes on the analytical tools to identify Hotspots. The results have not been subjected to sensitivity analysis to learn how the descriptions produced are dependent upon the algorithm choices made by the analysts. Only after running several models using different specifications can robust findings emerge. Readers should treat these results as exploratory only, and are conditional on how the analysis was conducted.

The units of analysis were the unique crime incidents occurring in Dubuque between 2006 and 2009. For this analysis, 2006 and 2008 crime incidents are analyzed, the years that provided the most complete set of addresses for analysis of total incidents.

Hotspot analysis was conducted on the following types of crime incidents and their geocoded latitude and longitude coordinates:

- UCR Violent
- UCR Property
- Non-UCR Violent
- Non-UCR Property
- Civil Disorder
- Drugs & Alcohol Related Crime

All the results reported here are based on clustering algorithms that specified a threshold distance of 500 feet. This is among the minimum distances used in hotspot analysis and seems appropriate for capturing concentrated events in city center areas characterized by higher densities. Ten

was the minimum number of events needed to create a hotspot cluster. Since data were analyzed by year, this minimum corresponds to nearly an average of one event per month occurring at locations within 500 feet of one another to classify as a hotspot.

The maps summarizing the results are included as the main part of this report. Each crime analyzed produced geographically shaped hotspots (convex hulls that more closely trace the exact shape of the hotspot than an ellipse would) that outline the polygon shape of the area enclosing all of the crime events at that location. The hotspots based on Section 8 housing are overlaid on the same map so one can visually determine the extent to which concentrated crime occurs at sites where there is also a concentration of Section 8 housing.

A summary of the interpretations of the hotspot maps produced in this analysis are highlighted below:

### ***Section 8 Hotspots***

On all of the maps, Section 8 hotspots are overlaid with the specific crime hotspots. The distribution of Section 8 hotspots, n=63, are identical in 2006 and 2008.

From a housing policy perspective, Section 8 concentrations appear to be fairly dispersed, albeit across the central, downtown areas of Dubuque. This is the more dense area of the city so it is not unusual to see subsidized housing stock in these types of locations. Making use of the standing rental stock and avoiding large scale, dense housing units is currently considered a best practice. However, if these more scattered sites remain in poverty stricken areas, the cumulative disadvantage associated with such areas may reduce the quality of life of residents and generate higher criminal victimization and perpetration rates experienced by residents in these areas. Rehabilitation of housing stock and locating Section 8 sites in mixed income neighborhoods can ameliorate these environmental conditions.

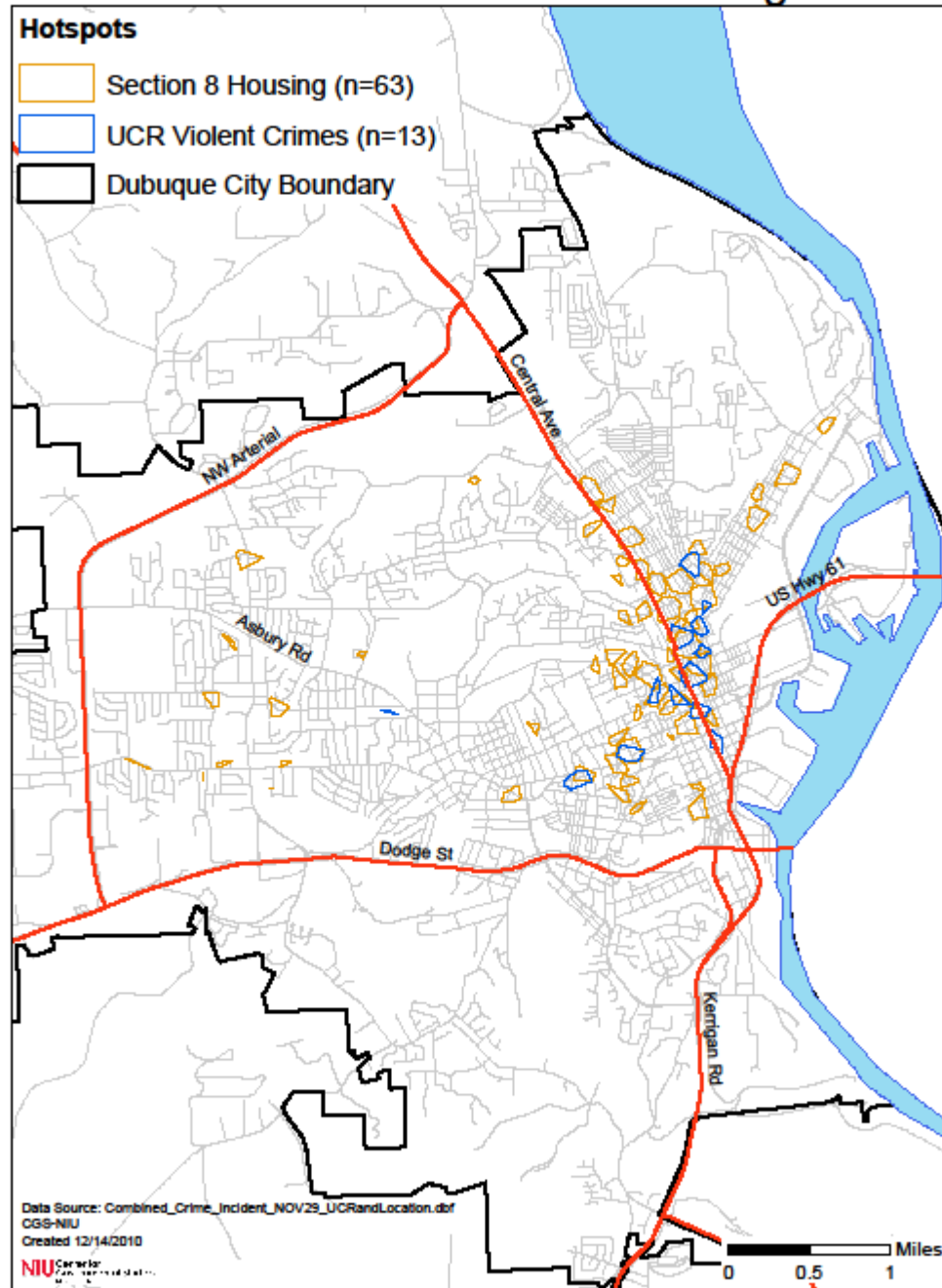
### **UCR Violent Crime**

In 2008, only 13 UCR Violent crime hotspots were identified; only 17.5% of the Section 8 hotspots overlapped or were contingent with the UCR Violent crime hotspots. The analysis identified 10 UCR-Violent Crime hotspots in 2006 and 13 in 2008. Seven of the 10 in 2006, and 11 of the 13 in 2008 were contingent or overlapped with Section 8 hotspots. Aggravated assaults make up the majority of these violent crimes, and poverty is correlated with this type of criminal violence, so this degree of

overlap is not unusual. Furthermore, all but two or three of the UCR Violent crime hotspots are in the downtown area, suggesting that this geographical area with its commercial and entertainment establishments increases the concentration of violent crime. Importantly, one must note that the vast majority (82.5%) of Section 8 hotspots are not implicated with the few UCR-Violent hotspots. Section 8 concentration does not 'generate' violent crime hotspots at high rates. See Table 27 in III-C. (See Map that follows ES-Map 9)



## Hotspot Analysis of 2008 UCR Violent Crimes and Section 8 Housing

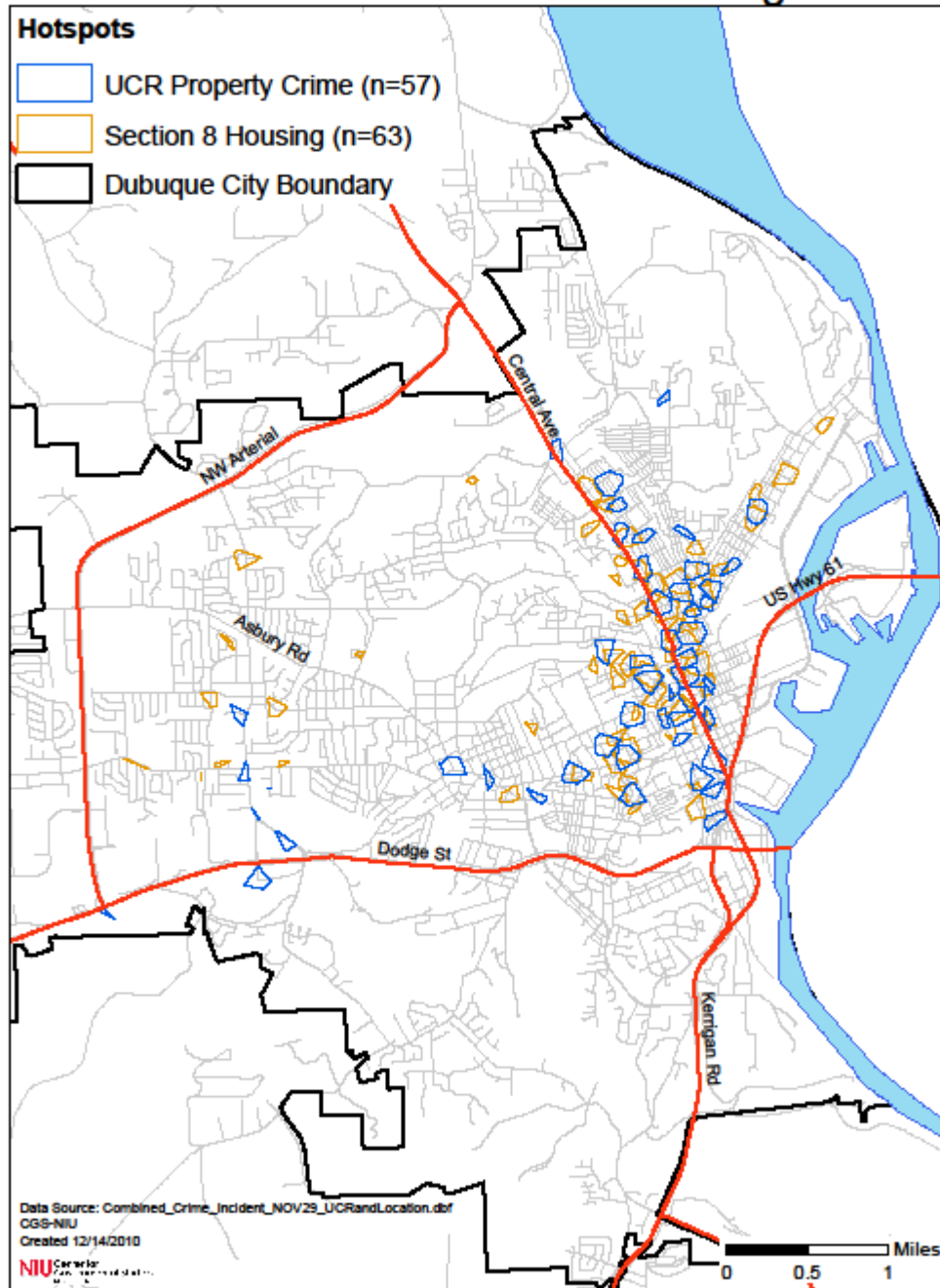




### UCR Property Crime

Property crimes are much more frequent than violent crimes so the large numbers of UCR Property crime hotspots are not surprising (n=46 in 2006, n=57 in 2008). Given also that the largest category of property crimes, larceny, are more likely to occur in public places or shopping areas, it is not surprising that the UCR Property hotspots appear in the denser, downtown area. We also see a much greater level of overlap in the Section 8 hotspots and UCR Property crime hotspots; in 2008, two-thirds of the Section 8 hotspots overlap or are contingent to crime hotspots (see Table 27); and all but a quarter of the crime hotspots overlap or are contingent to Section 8 hotspots. (See Map that follows ES-Map 10)

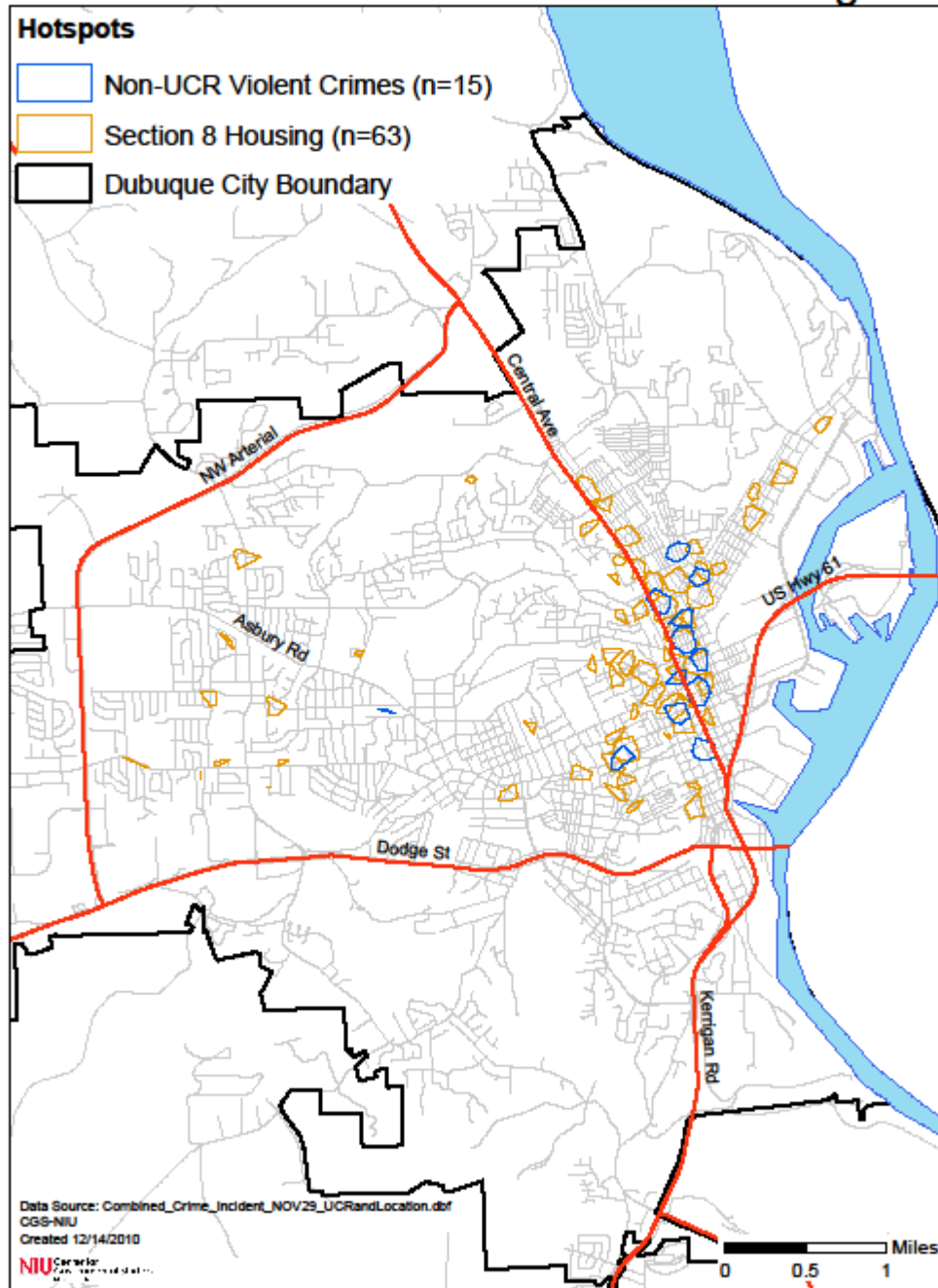
## Hotspot Analysis of 2008 UCR Property Crimes and Section 8 Housing



### Non-UCR Violent Crimes

Many Section 8 housing hotspots, even those in the downtown area, are not contingent with no overlap Non-UCR Violent hotspots (in 2008, 84.1% in Table 27). However, ten of the 16 Non-UCR Violent crime hotspots overlap or are contingent with Section 8 hotspots in 2006; and ten of 15 overlap with Section 8 housing in 2008. Again, nearly all of the overlapping is situated in the downtown areas where other factors likely mitigate the generation of non-UCR Violence beyond poverty per se. (See Map that follows ES-Map 11)

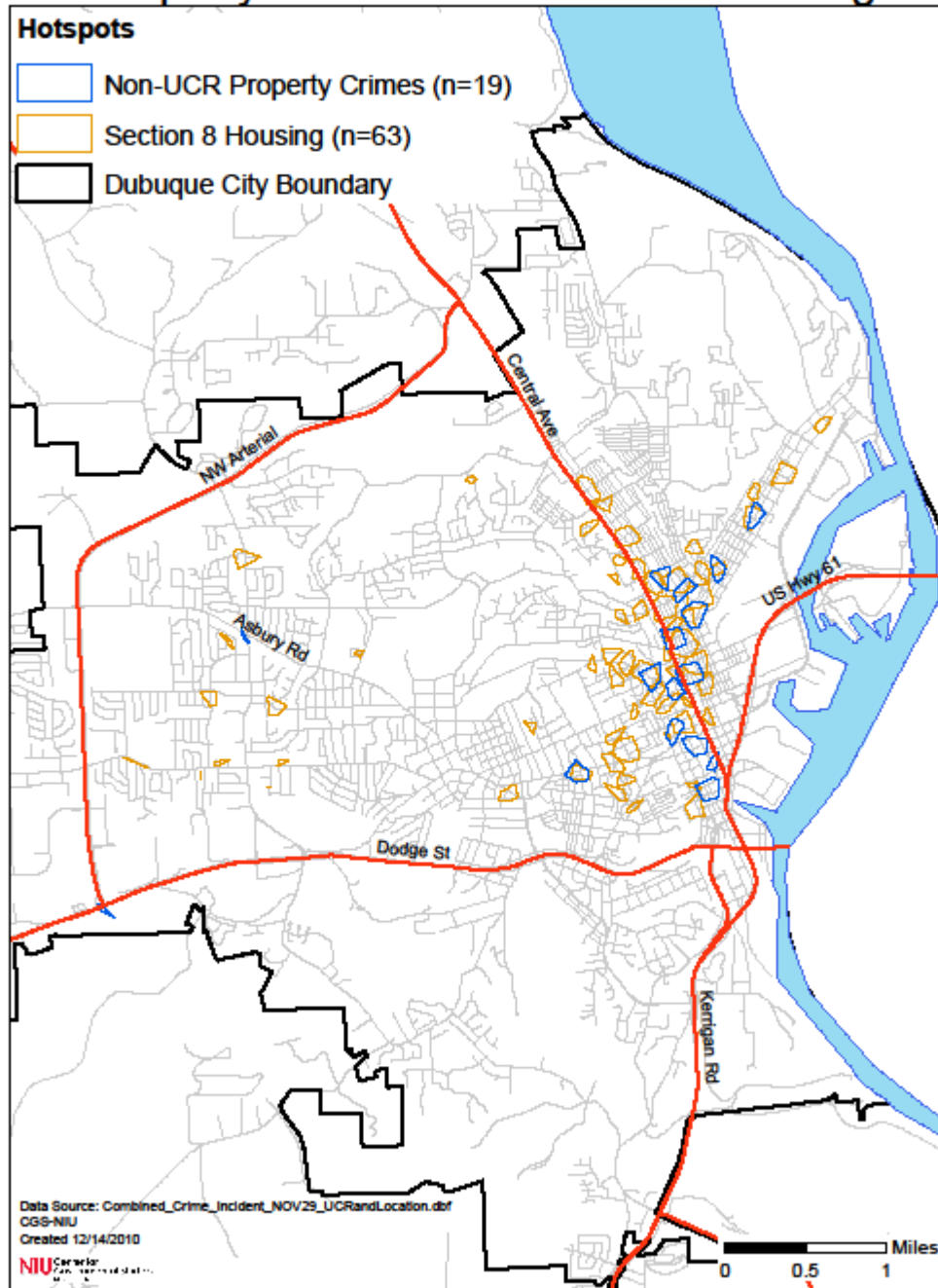
## Hotspot Analysis of 2008 Non-UCR Violent Crimes and Section 8 Housing



### Non-UCR Property Crimes

Again the majority (81% in Table 27) of Section 8 hotspots are not implicated in Non-UCR Property crime in 2008, especially those outside of the dense downtown area. All but three of the 21 Non-UCR Property crime hotspots overlap or are contingent with section 8 hotspots in 2006; and again only three of the 19 crime hotspots show appreciable distance from Section 8 hotspots in 2008. Nearly all of these hotspots are in the downtown area. (See Map that follows ES-Map 12)

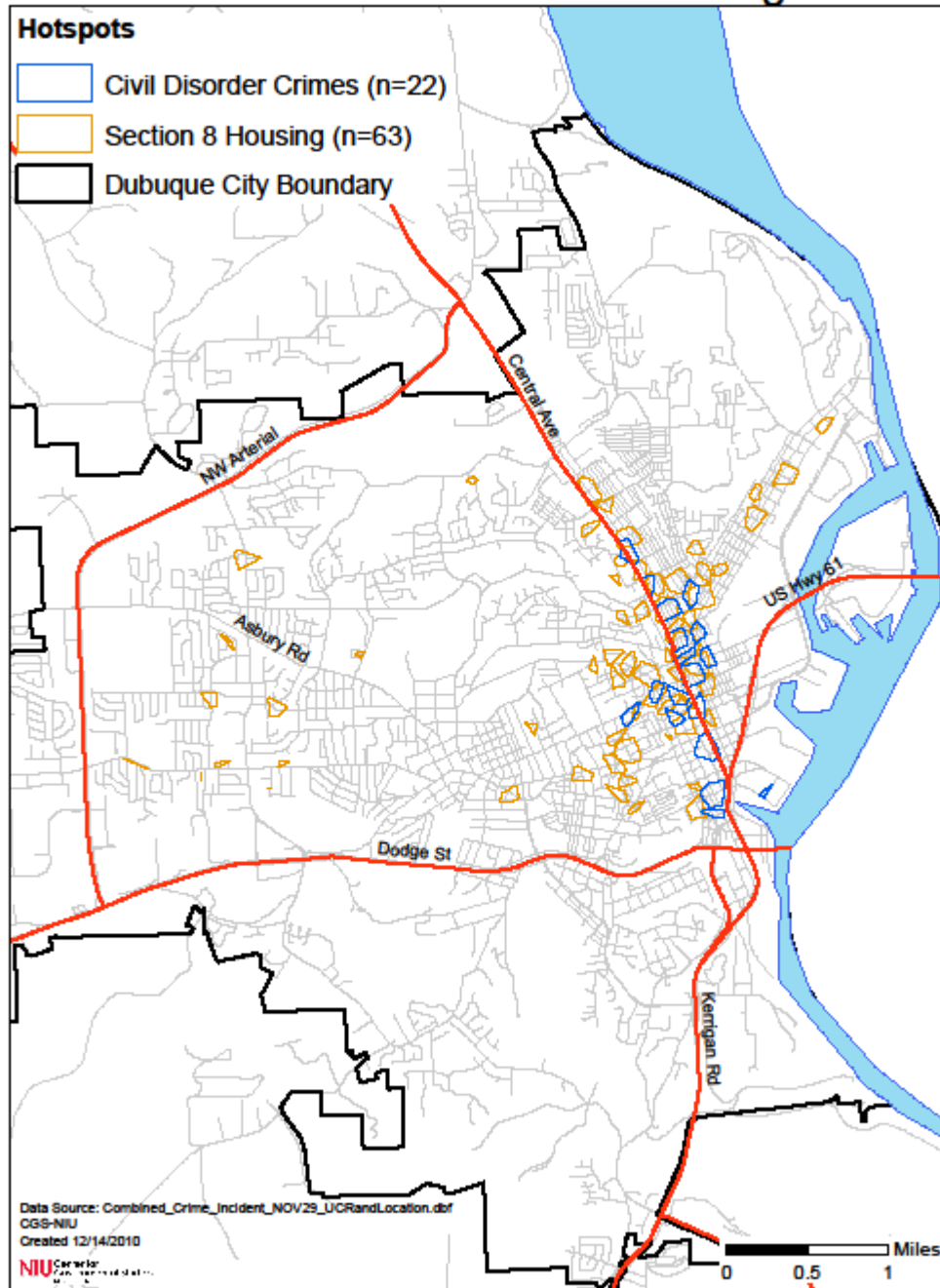
## Hotspot Analysis of 2008 Non-UCR Property Crimes and Section 8 Housing



### Civil Disorder

The spatial distribution of Civil Disorder hotspots shows somewhat more of an implication with Section 8 hotspots, in 2008, 25.4% are contingent with or overlap a Civil Disorder hotspot. All but five of the Civil Disorder hotspots (n=20 in 2006, n=22 in 2008) were situated in the downtown area, and all but one or two of these overlapped or were contingent with Section 8 hotspots. None of the Section 8 hotspots outside of this area were implicated with a Civil Disorder hotspot. (See Map that follows ES-Map 13)

## Hotspot Analysis of 2008 Civil Disorder Crimes and Section 8 Housing





### Drugs and Alcohol Crimes

There are few Drugs and Alcohol hotspots; one of the reasons why so few Section 8 hotspots are implicated; in 2008 only 12.7% of the Section 8 hotspots overlapped or were contingent with these crime hotspots. However, in 2006, all five Drug and Alcohol crime hotspots were located in the downtown area and all were contingent with or overlapped Section 8 housing hotspots. In 2008, nine of the eleven Drug & Alcohol crime hotspots were in the downtown area; all but one overlapped or was contingent with a Section 8 hotspot. The analysis indicates an increase in concentrated drug and alcohol crimes from 2006 to 2008. (See Map that follows ES-Map 14)