Evaluation of Traffic Barricade Impact on Crime in Pendleton: Cincinnati, Ohio

Submitted to Sgt. Maris Herold of the Cincinnati Police Department

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[1] Names listed in alphabetical order.

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EXECUTIVE SUMMARY

Purpose

An impact assessment of the traffic barricade placed at the corner of 13th Street and Reading Road in Cincinnati, Ohio, is provided in this research report. Police data are used to evaluate the effectiveness of the barricade in reducing criminal activity in the Pendleton area. More specifically, the following research questions are examined using density maps, point maps, and tests for statistical significance:

- Did crime go down in Pendleton as a result of the barricade?
- Was there a significant decrease in crime on the 500 block of 13th Street after the implementation of the barricade?
- Did crime displacement occur? If so, how much displacement occurred and to what locations did crime displace?

Analysis and Findings

The analysis begins with a broad generalization of crime patterns in Pendleton. The scope of the study is then expanded to include an examination of smaller geographic areas and specific offense categories. The analyses and results are divided into four general sections. The major findings of the evaluation are as follows:

- There is little evidence to suggest a significant reduction in crime has occurred in Pendleton, although arrests statistics indicate that there has been a reduction in serious crimes while the number of less serious crimes has increased.
- A significant reduction in crime has occurred on the 500 block of 13th Street, while the number of crimes occurring on 500 block of 12th Street has significantly increased.
- Although the level of serious violent crime in Pendleton appears to have significantly decreased, the hypothesis that the barricade is responsible for this reduction is not supported by spatial analyses.
- Statistics reveal that the barricade has significantly reduced the level of drug-related activity on 13th Street. However, much of this crime has been displaced to 12th Street.

Conclusion

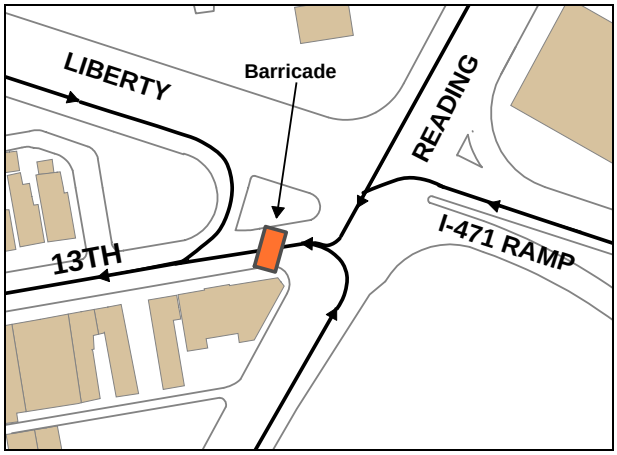
The implementation of the barricade has achieved the initial objective of reducing drug-related offenses and activity on 13th Street. Crime displacement, however, has reduced the overall effectiveness of this crime prevention effort.

INTRODUCTION

On July 28, 2004, the City of Cincinnati placed a traffic barricade at the intersection of 13th Street and Reading Road in an effort to reduce crime on 13th Street. Police, community leaders, and city officials had identified 13th Street as a hot spot of violent crime, drug activity, and general disorder. Prior to the placement of the barricade, 13th Street was restricted to west-bound traffic and the 500 block could be accessed directly from Reading Road (including the I-471 off-ramp) and eastbound Liberty Street.

The barricade was placed at the easternmost edge of the Pendleton neighborhood boundary. It was designed to disrupt drug activity by preventing drug buyers from exiting I-471 and turning directly onto 13th Street from Reading Road (see Figure 1). City officials hoped the barricade would deter buyers from entering the area and eliminate the open air drug market sustained by this traffic. This crime-reduction approach has been supported by research on street barricades throughout the U.S. and Europe. Previous research has determined that street closures often significantly reduce crime in areas with high level of violence and drug activity.[2]

FIGURE 1. TRAFFIC FLOW TO 13TH STREET AND BARRICADE LOCATION



[2] See the National Institute of Justice Publication by Lasley (1998), *"Designing Out" Gang Homicides and Street Assaults"* or the Problem-Oriented Policing guide by Harocopos and Hough (2005) *"Drug Dealing in Open Air Markets."*

The barricade was not constructed to stand as a permanent solution. The street closure is currently considered part of a six-month pilot project. The City plans to assess the effectiveness of the intervention at the end of this six-month period. The Cincinnati City Council will review the recommendations of various city agencies prior to the removal or reinforcement of the barricade. The purpose of the current report is to assist in this assessment by providing spatial and statistical analyses of police crime data both prior to and following the implementation of the traffic barricade.

RESEARCH QUESTIONS

The specific research objective of this evaluation is to determine the relative effectiveness of the traffic barricade in reducing crime. Three general questions guide this barricade impact assessment:

- **Did crime go down in Pendleton as a result of the barricade?**
- **Was there a significant decrease in crime on the 500 block of 13th Street after the implementation of the barricade?**
- **Did crime displacement occur? If so, how much displacement occurred and to what locations did crime displace?**

METHODOLOGY

The methods used to conduct the barricade impact assessment are described below. First, the types of data used and the limitations of the data are discussed. Second, the evaluation design of the project and periods of analysis are outlined. Finally, the statistical procedures used in the analysis and the limitations associated with these techniques are presented.

DATA

Crime data for the Pendleton area were obtained from the Cincinnati Police Department. Five types of crime data were collected:

1. Calls For Service
2. Part 1 Crimes
3. Part 2 Crimes
4. Part 1 Arrests
5. Part 2 Arrests[3]

All five datasets can be used as general indicators of criminal activity. However, using only police data to estimate true levels of crime has several limitations. First, not all crimes are reported or come to the attention of police authorities. This is often particularly true for drug-related activity since people may feel threatened by aggressive dealers and fear retaliation for cooperating with authorities. Residents may also fail to report each occurrence if drug offenses are seen as commonplace activities within the community. Second, not all reported crimes can be substantiated by police and, therefore, may not be recorded in official police statistics. Third, police arrests statistics are a better indicator of police activity than actual crime activity. To minimize these biases associated with using police records, all five datasets are used in the analyses.

[3] Part 1 crime and Part 1 arrest data generally include more serious offenses than Part 2 crime and Part 2 arrest data.

EVALUATION DESIGN

The six-month pilot barricade project began on July 28, 2004 and is scheduled to end on January 28, 2005. Police data are analyzed for the first five months of the six month pilot project. Since the barricade pilot project does not extend for a full 12 months, seasonal effects must be controlled. Failure to control for seasonal effects would likely bias any crime difference estimates.[4] Therefore, seasonal effects are controlled by using police data for the same time period during 2003. Crimes that occurred after the implementation of the barricade are compared to crimes that occurred within the same five months during the previous year (see Table 1).

TABLE 1. EVALUATION STRATEGY TO CONTROL FOR SEASONAL EFFECTS

ANALYSIS PERIODS	**CORRESPONDING DATES**
Pre-Barricade	July 28, 2003 to December 28, 2003
Post-Barricade	July 28, 2004 to December 28, 2004

STATISTICS

Numbers of crimes committed within a particular area are likely to vary due to random fluctuations in crime patterns. Therefore, it is necessary to determine whether observed increases or decreases in criminal activity are the result of these random fluctuations or if they represent a significant change in the overall level of crime. To assess the effectiveness of the barricade, crime levels between the pre- and post-barricade time periods are analyzed using a non-parametric Chi-Square test statistic that separates significant differences from non-significant differences.

There are, however, two limitations to using this statistic. First, when the number of crimes analyzed is small, the results become less stable. In fact, this statistic cannot be used

[4] Seasonal effects on crime statistics have been consistently identified by researchers. More street crimes tend to occur in warmer months than in cooler months. Additionally, particular crimes tend to significantly increase prior to specific dates (e.g., December 25th).

when the expected cell size is less than five. This means that the statistic will not produce valid results when less than 10 crimes are included in the analysis. Also, the statistic cannot be used if one of the cells is equal to 0, since the variable is actually a constant in this case. For example, if nine crimes occurred prior to the implementation of the barricade but none were committed after (or vice versa), the Chi Square statistic cannot be used.

To supplement the statistical analyses, the raw difference and the percent change in crimes between the two analysis periods are presented. However, caution should be used when interpreting the percent change for relatively small numbers of offenses. For example, if one robbery occurred prior to the implementation of the barricade and two robberies occurred after, this would result in a 100 percent increase. Still, it should not be assumed that this increase was a significant one, as a change from one to two crimes is more likely due to random fluctuations than any other hypothesized influence.

FINDINGS

The findings of the evaluation are presented under four major subsections. Aggregate crime statistics for the entire Pendleton area are summarized in the first section. The more tightly defined geographic boundaries of the 500 block of 13th Street and 12th Street and the aggregate statistics associated with these areas are explored in the second section. Evidence of displacement is also considered in this section. In the third section, the impact of the barricade on violent crime statistics is investigated. The fourth and final section contains a summary of drug activity prior to and after the implementation of the barricade.

AGGREGATE STATISTICS FOR PENDLETON

The analysis begins with an attempt to determine whether the overall level of crime decreased in the Pendleton area as a result of the traffic barricade.[5] To do this, all crime data are examined for the pre- and post-barricade analysis periods (see Table 2). No significant changes in crime levels are found in the calls for service, Part 1 crime, or Part 2 crime data. However, based on the arrests statistics, it appears that serious crimes have significantly decreased (Part 1 arrests) while less serious crimes have significantly increased (Part 2 arrests).

While it is necessary to control for seasonal effects, using data from a year prior to the actual implementation of the barricade may mask significant decreases in crime if crimes are expected to increase from year to year. In other words, there may appear to be no significant difference between the pre and post periods even if the barricade is having a significant impact because the barricade prevented the number of crimes from increasing.

[5] The Pendleton neighborhood is bounded by Sycamore Street, Liberty Street, Reading Road, and a small portion Central Parkway.

TABLE 2. AGGREGATE CRIME STATISTICS FOR PENDELTON AREA:
5 MONTH PRE- AND POST-BARRICADE ANALYSIS[6]

Data	Pre (N)	Post (N)	Difference	Percent Change	Significant
Calls For Service	813	837	+24	+2.95%	No
Part 1 Crimes	98	93	-5	-5.1%	No
Part 2 Crimes	52	59	+7	+13.46%	No
Part 1 Arrests	12	4	-8	-66.67%	Yes*
Part 2 Arrests	112	188	+76	+67.86%	Yes**

*p < .05
**p < .0001

To test this hypothesis, an immediate impact assessment is conducted. It can be argued that the month of July is not radically different from the month of August in terms of seasonal effects on crime. Both are summer months that tend to be relatively warm. Therefore, crime statistics for the month directly prior to the barricade is compared to crime statistics for the month directly following the intervention (June 27, 2004 to July 27, 2004 vs. July 28, 2004 to August 28, 2004).[7]

The immediate impact assessment produces results that are similar to the yearly analysis (see Table 3). Once again, no significant changes in crime levels are found in the calls for service or Part 1 crime data. However, this analysis fails to find any significant increase in Part 2 arrests and instead finds a significant decrease in Part 2 (less serious) crimes.

[6] The exact dates of both five month periods are July 28, 2003 to December 28, 2003 (pre) and July 28, 2004 to December 28, 2004 (post).
[7] This can only be done with aggregate statistics. Once the crimes are broken down by location or offense category, the numbers become too small to conduct a meaningful analysis.

TABLE 3. IMMEDIATE IMPACT OF BARRICADE IN PENDLETON:
JUNE 27-JULY 27 VS. JULY 28-AUGUST 28[8]

Data	Pre (N)	Post (N)	Difference	Percent Change	Significant
Calls For Service	194	185	-9	-4.64%	No
Part 1 Crimes	18	26	+8	+44.44%	No
Part 2 Crimes	18	9	-9	-50.0%	Yes*
Part 2 Arrests	38	36	-2	-5.26%	No

*p < .10

AGGREGATE STATISTICS FOR 13TH STREET AND 12TH STREET

To further investigate the impact of the barricade, the focus of the evaluation shifts to more precisely defined locations. While there does not seem to be overwhelming evidence to suggest that the Pendleton area has experienced a considerable reduction in crime, it is possible that significant decreases or increases in crime have occurred within smaller geographic boundaries.

A density map of calls for service in the Pendleton area is used to determine where concentrations of crime may have shifted (see Appendix A). The first thing to note is that the two maps reveal strikingly similar crime patterns. However, the greatest shift in overall crime concentration appears to have occurred on 13th Street and 12th Street. The density map reveals a general decrease along the 500 block of 13th Street and a considerable increase along the 500 block of 12th Street in the density of calls for service.[9] Therefore, crime statistics for each of these areas are examined separately.

[8] Part 1 arrest statistics are not represented – no Part 1 arrests were made in Pendleton during these two months.
[9] This shift in crime was also confirmed by interviews with Pendleton neighborhood officers, giving greater credibility to this finding.

A more consistent change in the level of crime is found along the 500 block of 13th Street when compared to Pendleton as a whole (see Table 4). There was a significant reduction in overall calls for service and Part 2 arrests after the implementation of the barricade. There was also a decrease in Part 1 crimes and Part 1 arrests although low numbers prevent these reductions from reaching significance. Only Part 2 crimes increased on 13th Street, but this difference is not significant.

TABLE 4. AGGREGATE CRIME STATISTICS FOR 500 BLOCK OF 13TH STREET IN PENDLETON: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS

Data	Pre (N)	Post (N)	Difference	Percent Change	Significant
Calls For Service	191	126	-65	-34.03%	Yes*
Part 1 Crimes	8	6	-2	-25.0%	No
Part 2 Crimes	8	15	+7	+87.5%	No
Part 1 Arrests	3	0	-3	-100.0%	N/A**
Part 2 Arrests	32	13	-19	-59.38%	Yes***

*p < .0001
**Significance tests cannot be run when the data contain values equal to 0
***p = .005

While significant decreases in aggregate crime statistics are found on 13th Street, the number of crimes occurring on the 500 block of 12th Street appears to have significantly increased (see Table 5). Calls for service and Part 2 arrests increased significantly. Serious crimes (Part 1) also increased, but again, low numbers prevent this change from reaching significance. Only small and insignificant decreases are found in the Part 2 crime and Part 1 arrest statistics.

TABLE 5. AGGREGATE CRIME STATISTICS FOR 500 BLOCK OF 12TH STREET IN PENDLETON: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS

Data	Pre (N)	Post (N)	Difference	Percent Change	Significant
Calls For Service	68	140	+72	+105.88%	Yes*
Part 1 Crimes	2	6	+4	+200.0%	N/A**
Part 2 Crimes	6	4	-2	-33.33%	No
Part 1 Arrests	1	0	-1	-100.0%	N/A**
Part 2 Arrests	11	38	+27	+245.45%	Yes*

*$p < .0001$

**Significance tests cannot be run when the expected frequencies are less than 5 or when the data contain values equal to 0

VIOLENT CRIME STATISTICS

Three general areas have now been identified for analysis: the entire Pendleton area, the 500 block of 13th Street, and the 500 block of 12th Street. The next step is to disaggregate the crime statistics to examine violent and drug-related crimes within these geographic areas. While aggregate statistics help to provide a general crime "picture," there is little reason to believe that the street barricade would decrease all crime types. For example, it is reasonable to expect that violent street robberies might be reduced after implementing the barricade; however, there is no theoretically meaningful reason to believe that the barricade has reduced levels of domestic violence. Therefore, the statistics are reanalyzed using violent and drug-related crime categories for each location. Violent crimes are examined first.

Part 1 and Part 2 crime statistics reveal no significant change in the number of violent crimes occurring in Pendleton, or on 13th or 12th Street, although the overall decrease in Pendleton approaches significance (see Table 6). The overall decrease in violent crime in

Pendleton (-12) cannot be accounted for by changes in crime on either 13th Street (-2) or 12th Street (+1). These crimes were mapped for further spatial analysis (see Appendix B). Interestingly, it appears that the decrease in violent crime occurred mostly toward the edges of the Pendleton neighborhood boundaries. Due to the spatial variation of these crimes, there is no reason to suspect that this decrease is related to the barricade.

TABLE 6. VIOLENT P1 AND P2 CRIME STATISTICS: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS[10]

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	36	24	-12	-33.33%	No*
500 block of 13th Street	7	5	-2	-28.57%	No
500 block of 12th Street	3	4	+1	+33.33%	N/A**

*approaches significance at p = .121
**Significance tests cannot be run when the expected frequencies are less than 5

An analysis of arrest statistics reveals a substantial decrease for serious offenses (see Table 7). The decrease in the Pendleton area reaches significance and no arrests for violence were made on either 13th Street or 12th Street after the barricade was implemented. For the Part 2 arrest analysis, disorderly conduct and weapon offenses were combined with the violent offenses.[11] No significant differences were found (see Table 8). However, it is interesting to note that violent Part 2 arrests decreased by three crimes on 13th Street and increased by three crimes on 12th Street (see Appendix C), giving further support to the displacement hypothesis.

[10] The violent crime category was created by combining statistics for the following offenses: Part 1 crimes – aggravated robbery, felonious assault, and robbery; Part 2 crimes – aggravated menacing, assault, and intimidation.
[11] Low numbers within the crime categories prevented a disaggregated analysis.

TABLE 7. VIOLENT P1 ARREST STATISTICS: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS[12]

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	9	1	-8	-88.89%	Yes*
500 block of 13th Street	3	0	-3	-100.0%	N/A**
500 block of 12th Street	1	0	-1	-100.0%	N/A**

*p = .011

**Significance tests cannot be run when the expected frequencies are less than 5

TABLE 8. VIOLENT/DISORDERLY CONDUCT/WEAPON OFFENSE P2 ARREST STATISTICS: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS[13]

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	16	21	+5	+31.25%	No
500 block of 13th Street	6	3	-3	-50.0%	N/A*
500 block of 12th Street	2	5	+3	+150.0%	N/A*

*Significance tests cannot be run when the expected frequencies are less than 5

The calls for service data indicate no significant changes in violence, disorderly conduct, and weapon offenses combined in Pendleton or on 13th Street (see Table 9). The significant increase found in calls for service on 12th street was almost entirely driven by the "possible shots fired" crime category, which jumped from no calls prior to the barricade to 21 calls for this offense after the barricade was implemented.

[12] The violent arrest category was created by combining statistics for the following Part 1 offenses: aggravated burglary inflicting harm, aggravated robbery armed or resulting in harm, felonious assault with victim harmed or weapon, robbery, and murder.

[13] The violent/disorder/weapon arrest category was created by combining statistics for the following Part 2 offenses: aggravated menacing, assault victim harmed, assault on law officer, fighting or threatening, intimidation (also victim or witness intimidation), menacing, disorderly conduct, and all illegal weapon possession/concealment classifications.

TABLE 9. VIOLENT/DISORDERLY CONDUCT/WEAPON CALLS FOR SERVICE: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS[14]

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	172	175	+3	+1.74%	No
500 block of 13th Street	41	34	-7	-17.07%	No
500 block of 12th Street	16	43	+27	168.75%	Yes*

*p = < .0001 - Finding driven almost entirely by possible shots fired

DRUG-RELATED CRIME STATISTICS

Information on drug-related crimes is contained within the calls for service and Part 2 arrest databases. These offenses produce the most consist outcomes related to the overall impact of the barricade. Both data types show no impact on drug-related crime within Pendleton (see Tables 10 and 11). However, both datasets also show a significant decrease in drug-related activity on 13th Street and a significant increase in drug-related activity on 12th Street.[15] All drug-related calls for service seem to have shifted from 13th Street to 12th Street after the barricade was implemented (see Appendix D). Similarly, most drug-related arrests were made on 13th Street prior to the barricade and are now made on 12th Street. A density map depicting this shift in arrest location is provided in Appendix E.

[14] The violent/disorder/weapon calls for service category was created by combining the following crime categories: assault, person cut, fight, menacing, police officer needs assistance, robbery, person shot, possible shots fired, person with weapon, person with gun, disorderly person or crowd.

[15] The Chi Square test could not be used to establish significance for the decrease in drug calls for service on 13th Street. However manipulation of the data confirms that this is a significance difference.

TABLE 10. DRUG CALLS FOR SERVICE FOR PENDELTON AREA: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	18	14	-4	-22.22%	No
500 block of 13th Street	9	0	-9	-100.0%	N/A*
500 block of 12th Street	1	9	+8	+800.0%	Yes**

*Significance test cannot be run with a cell of 0 – see footnote 15
**$p < .02$ – but small cell size of 1 makes this result unstable

TABLE 11. DRUG ARRESTS FOR PENDELTON AREA: 5 MONTH PRE- AND POST-BARRICADE ANALYSIS[16]

Analysis Parameters	Pre (N)	Post (N)	Difference	Percent Change	Significant
Pendleton	42	49	+7	+16.67%	No
500 block of 13th Street	19	8	-11	-57.89%	Yes*
500 block of 12th Street	3	15	+12	+400.0%	Yes**

*$p < .05$
**$p = .005$

[16] The drug arrest category was created by combining statistics for the following Part 2 offenses: drug abuse, illegal possession of prescription drugs, no criminal record (marijuana record), possession of counterfeit controlled substance, possession of dangerous drug, possession of drug abuse instruments, possession of drug paraphernalia, possession of drugs, and all drug trafficking classifications.

CONCLUSIONS AND RECOMMENDATIONS

The analyses reveal that the barricade has significantly impacted crime patterns in Pendleton during the first five months of the pilot project period. However, estimating the magnitude of the impact is difficult due to the limitations of using police statistics. The findings are also dependent on the type of data used, the boundaries of the geographic analysis, and the type of crimes examined. Despite the limitations of this evaluation, some general conclusions can be drawn.

There is limited evidence to suggest that Pendleton, as a whole, is safer with the barricade in place. Only arrest data support this conclusion. Using this data as an indicator, it appears that serious crimes have decreased while less serious crimes have increased. Street-by-street analyses reveal that this weak finding is likely due to a general displacement of crime patterns. Aggregate crime statistics reveal that there has been a significant decrease in crime on 13th Street, while crime has increased significantly on 12th Street.

After disaggregating the data by offense type, the analyses show that much of the shift in crime patterns is associated with drug-related offenses. Multiple datasets clearly indicate that drug activity has been virtually eliminated from the 500 block of 13th Street. Yet, this significant decrease has been offset by a substantial increase in drug activity on 12th Street. Although the exact amount of displacement cannot be determined, it is reasonable to conclude that there has been a high level of crime displacement.

There is less evidence to suggest that the barricade has significantly decreased violent crimes. Much of the decrease in violent crime in Pendleton has occurred closer to the northern and southern boundaries of the neighborhood. This spatial patterning makes it difficult to attribute the decrease in violent activity to the barricade.

The findings of this evaluation are consistent with qualitative statements made by police, residents, and community leaders,[17] thus giving greater credibility to the conclusions of this study. The analysis, however, fails to capture more subtle environmental changes that may have occurred since the barricade was put into place. Some residents maintain there has been an improvement in the overall cleanliness of the neighborhood, particularly on the 500 block of 13th Street. This type of qualitative data, along with traffic pattern analyses and victimization surveys, could prove useful if future evaluations are conducted, as these data would allow a more complete assessment of the impact of the barricade.

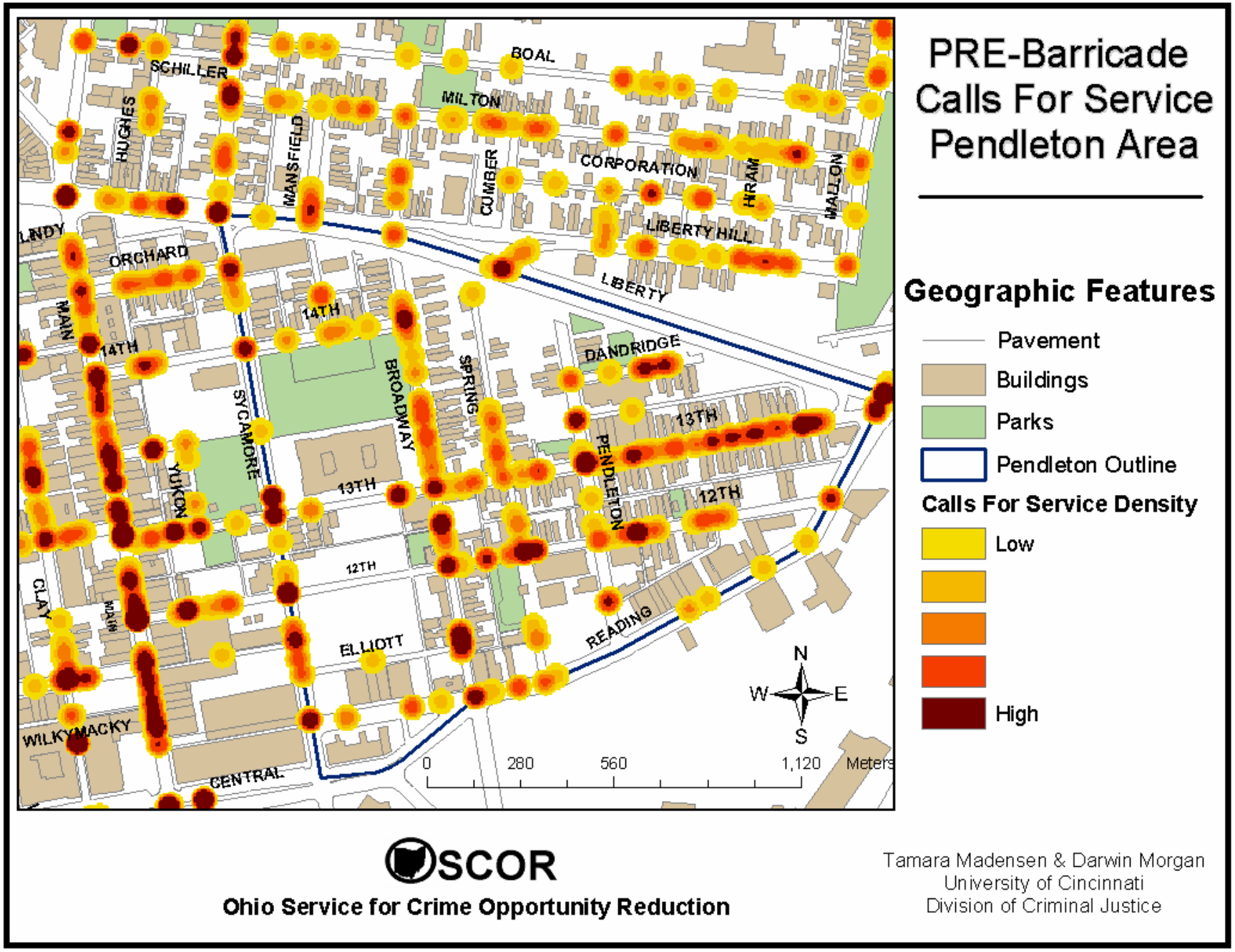
Unfortunately, differences in individual crimes could not be examined for statistical significance due to the small numbers associated with each offense type. These low numbers are the result of a relatively short evaluation period. There is, however, a breakdown of the pre- and post- barricade crime statistics in Appendix F for each crime that could be theoretically impacted by the barricade. But again, the observed differences should not be considered significant and caution must be used when interpreting differences in crimes that have low base numbers.

In conclusion, the statistics show that the barricade has successfully reduced drug dealing on 13th Street. However, based on the level of displacement detected, this intervention has not been successful in significantly reducing drug-related or violent crime in the entire Pendleton area. If the barricade is to remain on 13th Street, additional opportunity-reduction measures should be considered to address the criminal activity that has been displaced to 12th Street.

[17] These statements were made during interviews with the authors.

APPENDIX A

DENSITY MAPS – CALLS FOR SERVICE


PRE-Barricade
Calls For Service
Pendleton Area
Geographic Features
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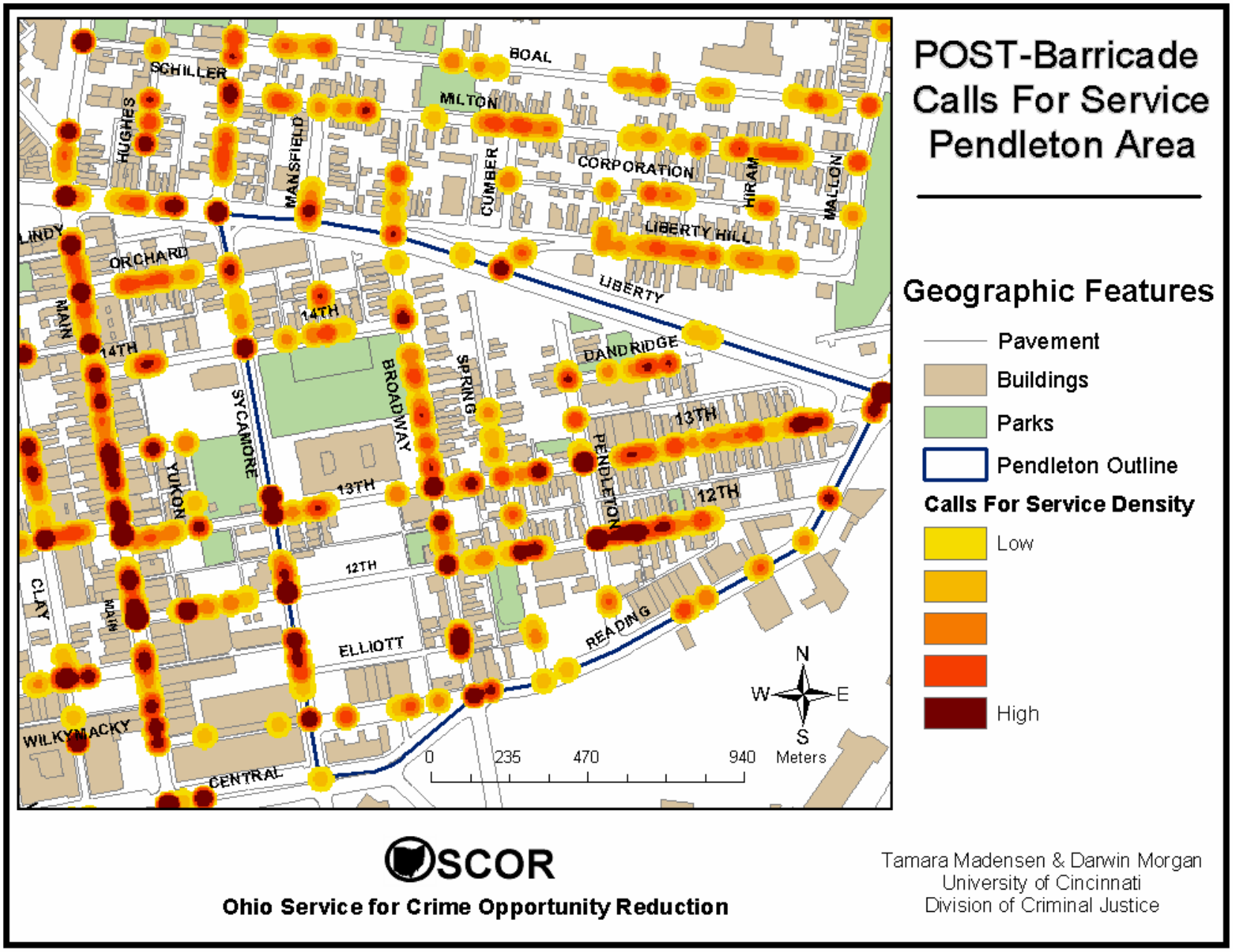
POST-Barricade
Calls For Service
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Pendleton Outline
Calls For Service Density
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Ohio Service for Crime Opportunity Reduction
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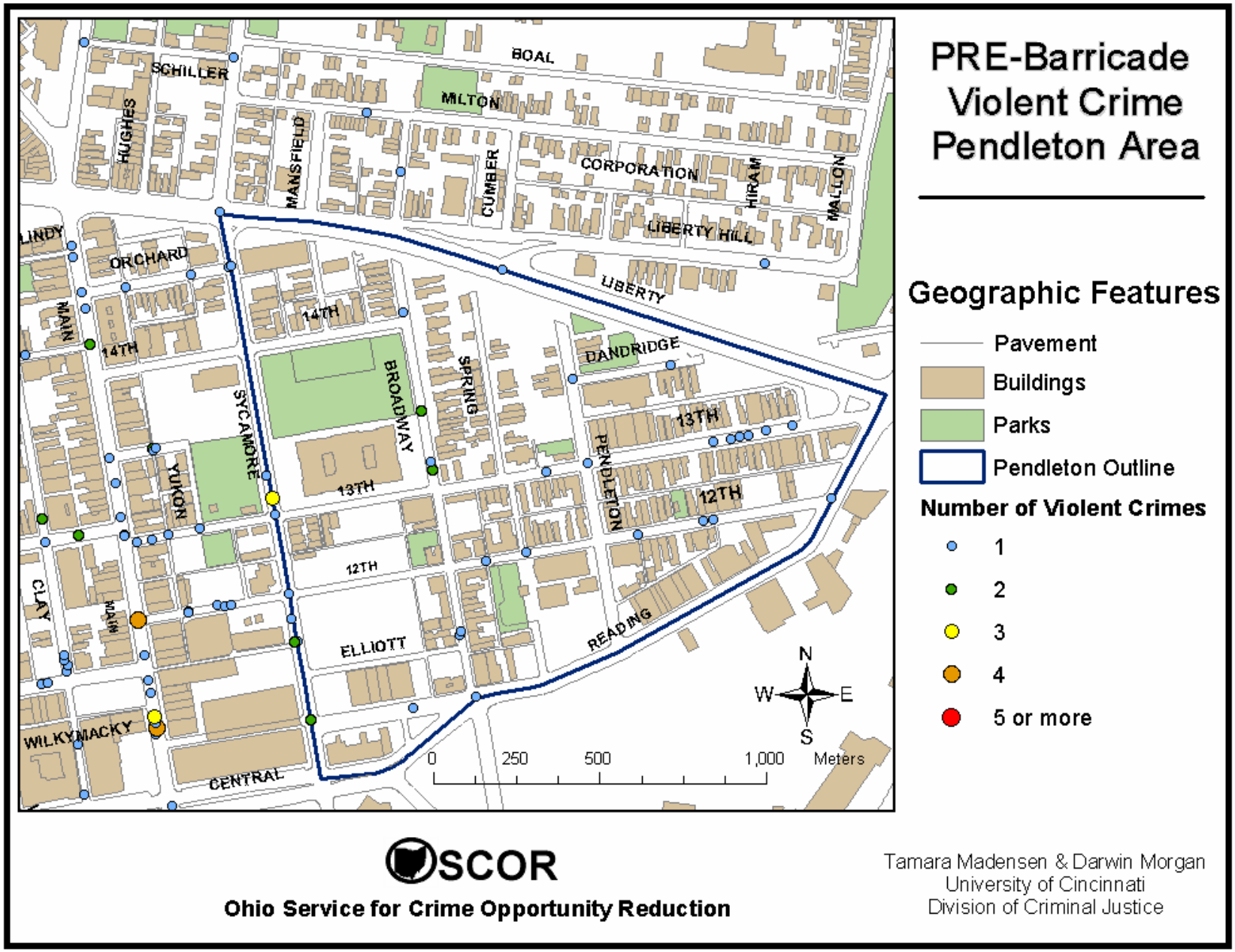
APPENDIX B

MAPS – VIOLENT CRIME IN PENDLETON


PRE-Barricade
Violent Crime
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
Number of Violent Crimes
1
2
3
4
5 or more
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HUGHES
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CUMBER
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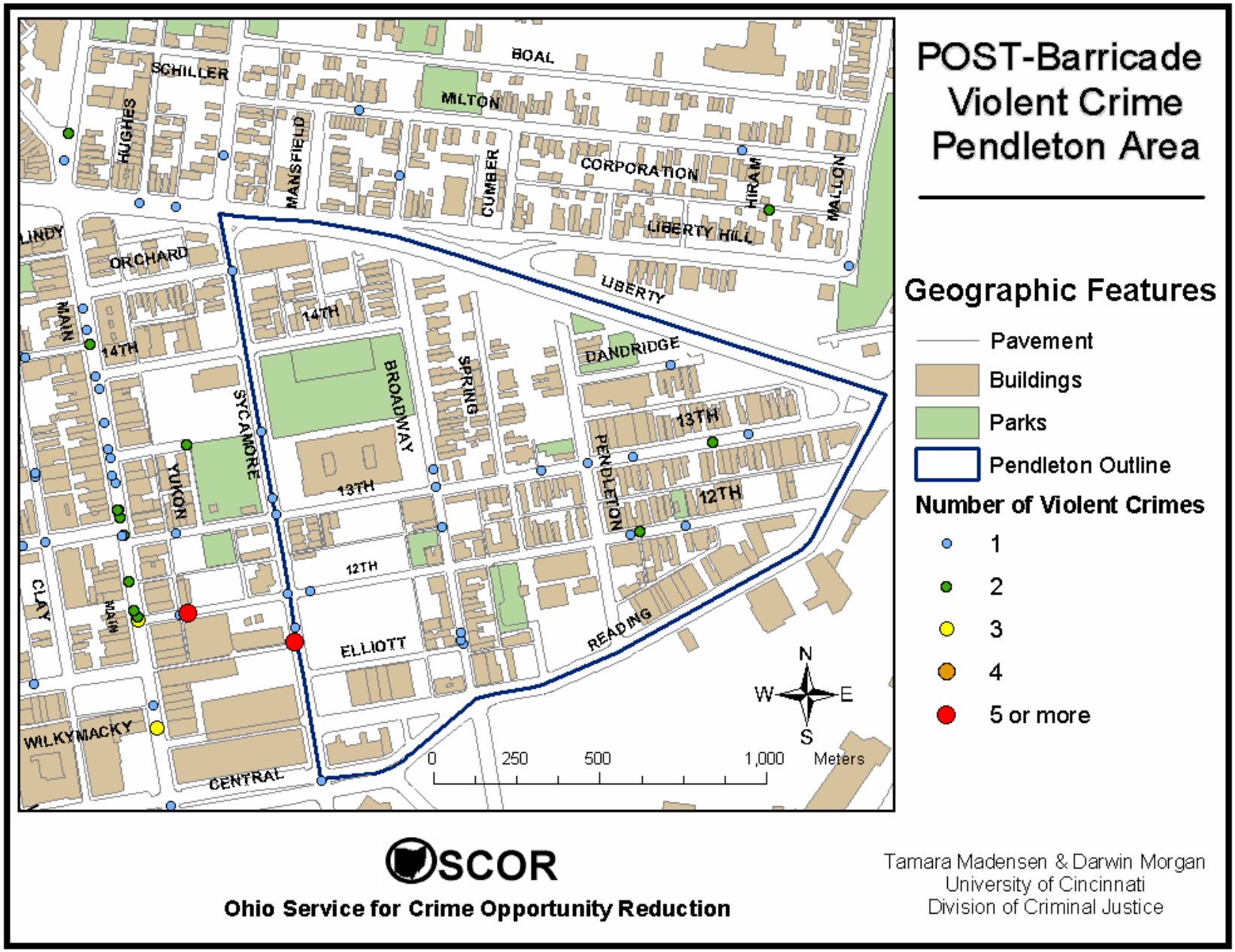
POST-Barricade
Violent Crime
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
Number of Violent Crimes
1
2
3
4
5 or more
BOAL
SCHILLER
MILTON
HUGHES
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LIBERTY HILL
LIBERTY
LINDY
ORCHARD
MAIN
14TH
BROADWAY
SPRING
DANDRIDGE
13TH
SYCAMORE
YUKON
PENDLETON
12TH
CLAY
ELLIOTT
READING
WILKYMACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
OSCOR
Ohio Service for Crime Opportunity Reduction
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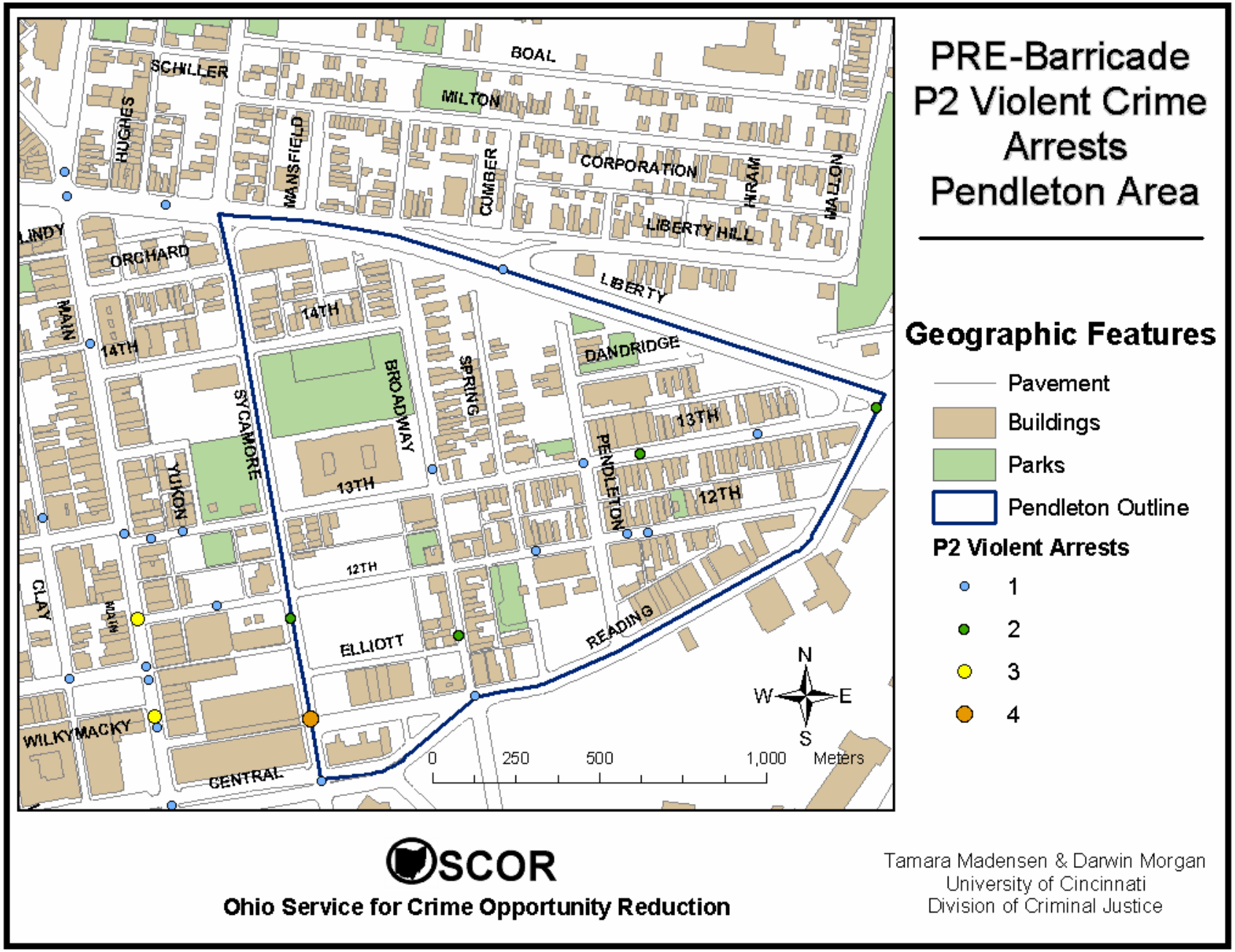
APPENDIX C

MAPS – P2 VIOLENT CRIME IN PENDLETON


PRE-Barricade
P2 Violent Crime
Arrests
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
P2 Violent Arrests
1
2
3
4
BOAL
SCHILLER
HUGHES
MILTON
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LIBERTY HILL
LINDY
ORCHARD
LIBERTY
MAIN
14TH
SYCAMORE
BROADWAY
SPRING
DANDRIDGE
13TH
PENDLETON
12TH
YUKON
ELLIOTT
READING
CLAY
WILKYMACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
SCOR
Ohio Service for Crime Opportunity Reduction
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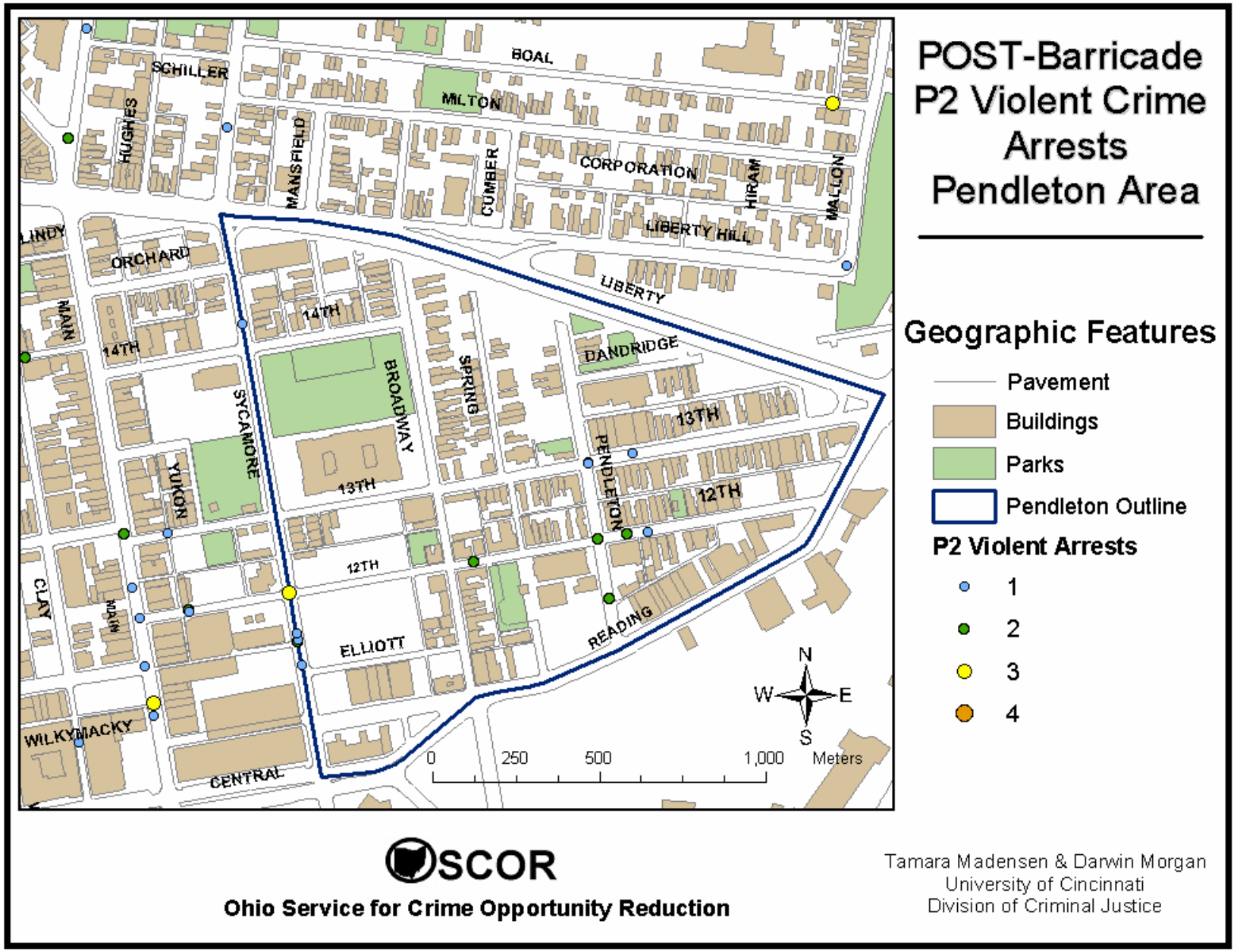
POST-Barricade
P2 Violent Crime
Arrests
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
P2 Violent Arrests
1
2
3
4
BOAL
SCHILLER
MILTON
HUGHES
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LIBERTY HILL
LIBERTY
LINDY
ORCHARD
MAIN
14TH
BROADWAY
SPRING
DANDRIDGE
13TH
SYCAMORE
YUKON
PENDLETON
12TH
CLAY
ELLIOTT
READING
WILKY
MACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
OSCOR
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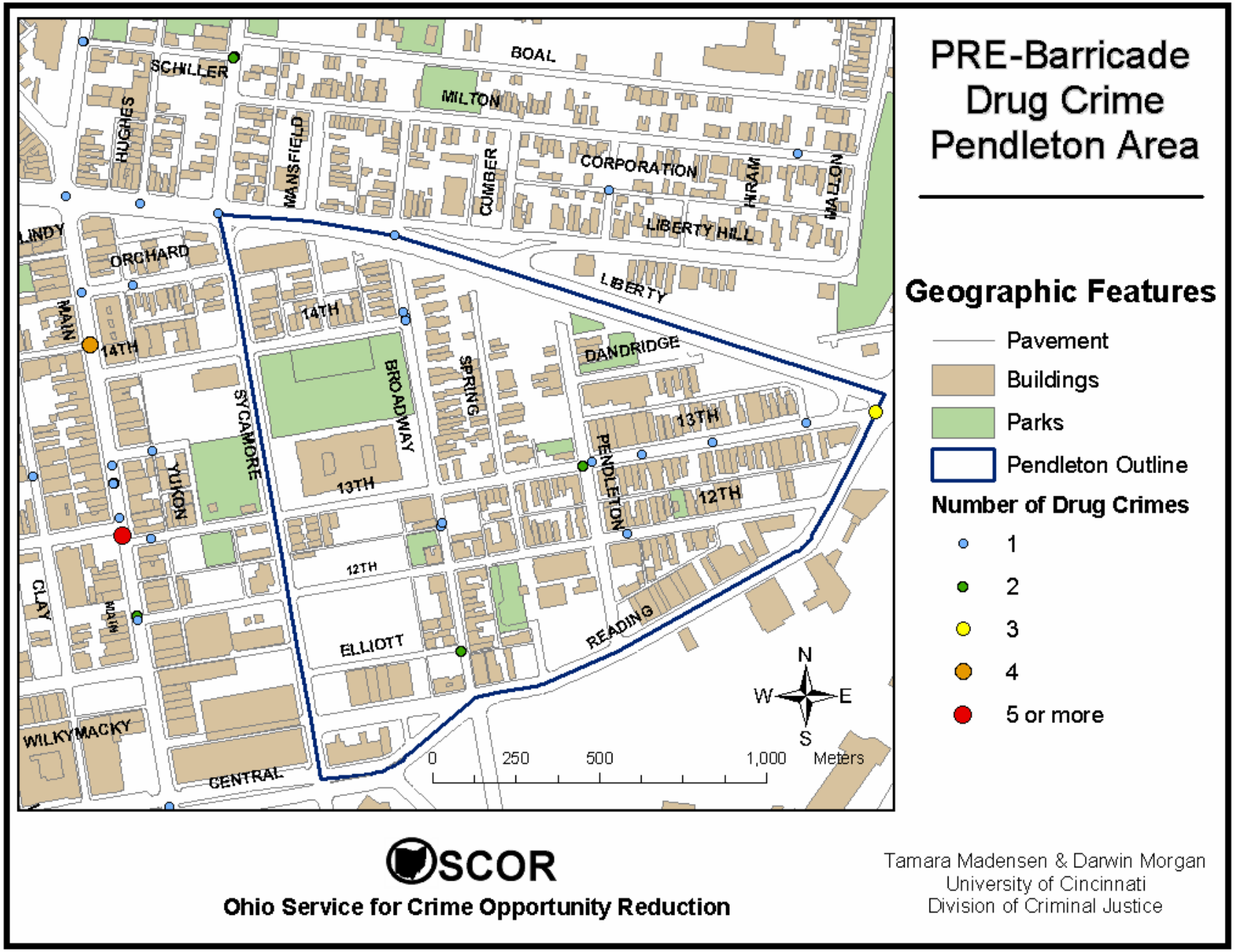
APPENDIX D

MAPS – DRUG CRIME IN PENDLETON



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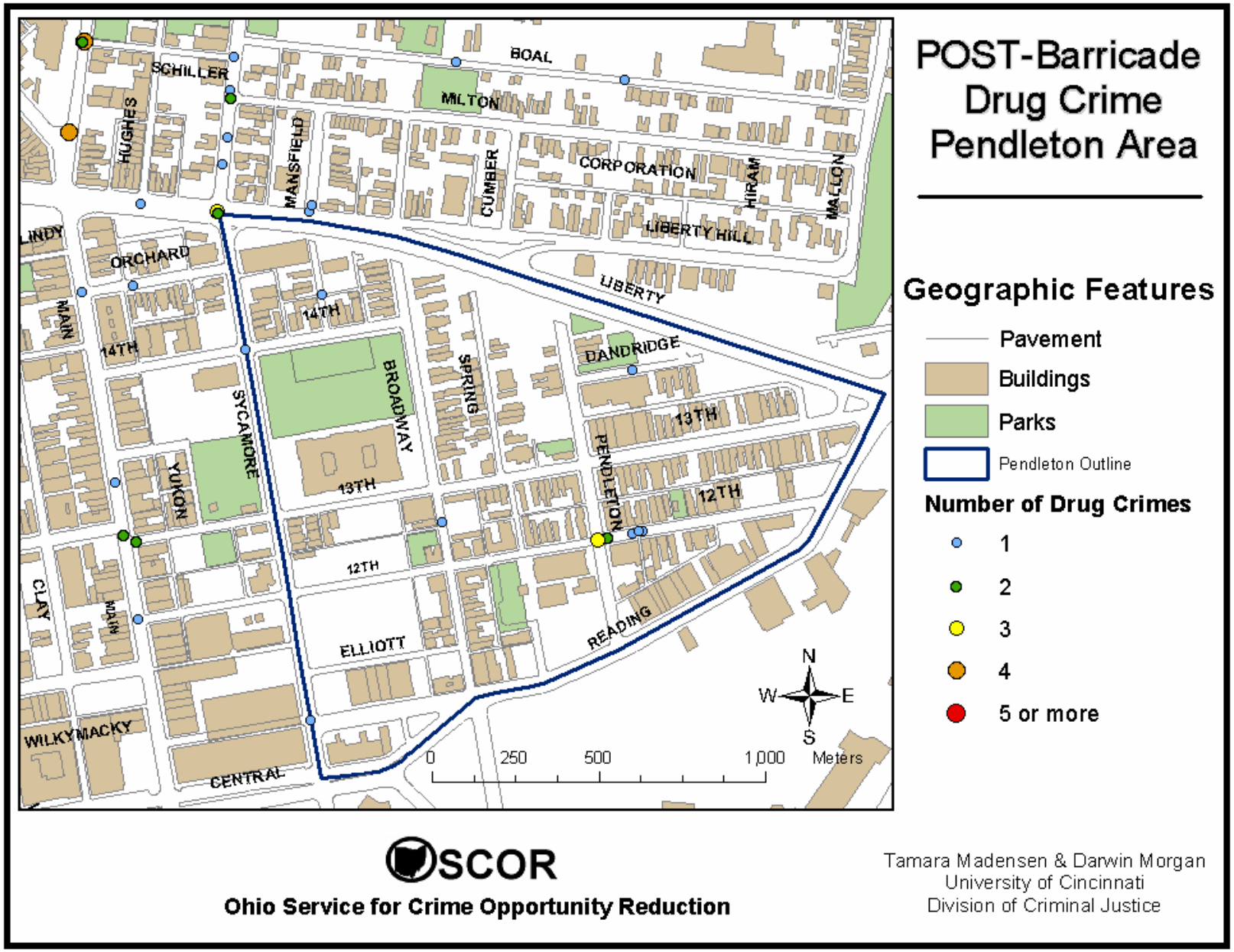
POST-Barricade
Drug Crime
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
Number of Drug Crimes
1
2
3
4
5 or more
BOAL
SCHILLER
MILTON
HUGHES
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LIBERTY HILL
LIBERTY
LINDY
ORCHARD
MAIN
14TH
DANDRIDGE
BROADWAY
SPRING
SYCAMORE
13TH
PENDLETON
YUKON
12TH
CLAY
ELLIOTT
READING
WILKYMACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
OSCOR
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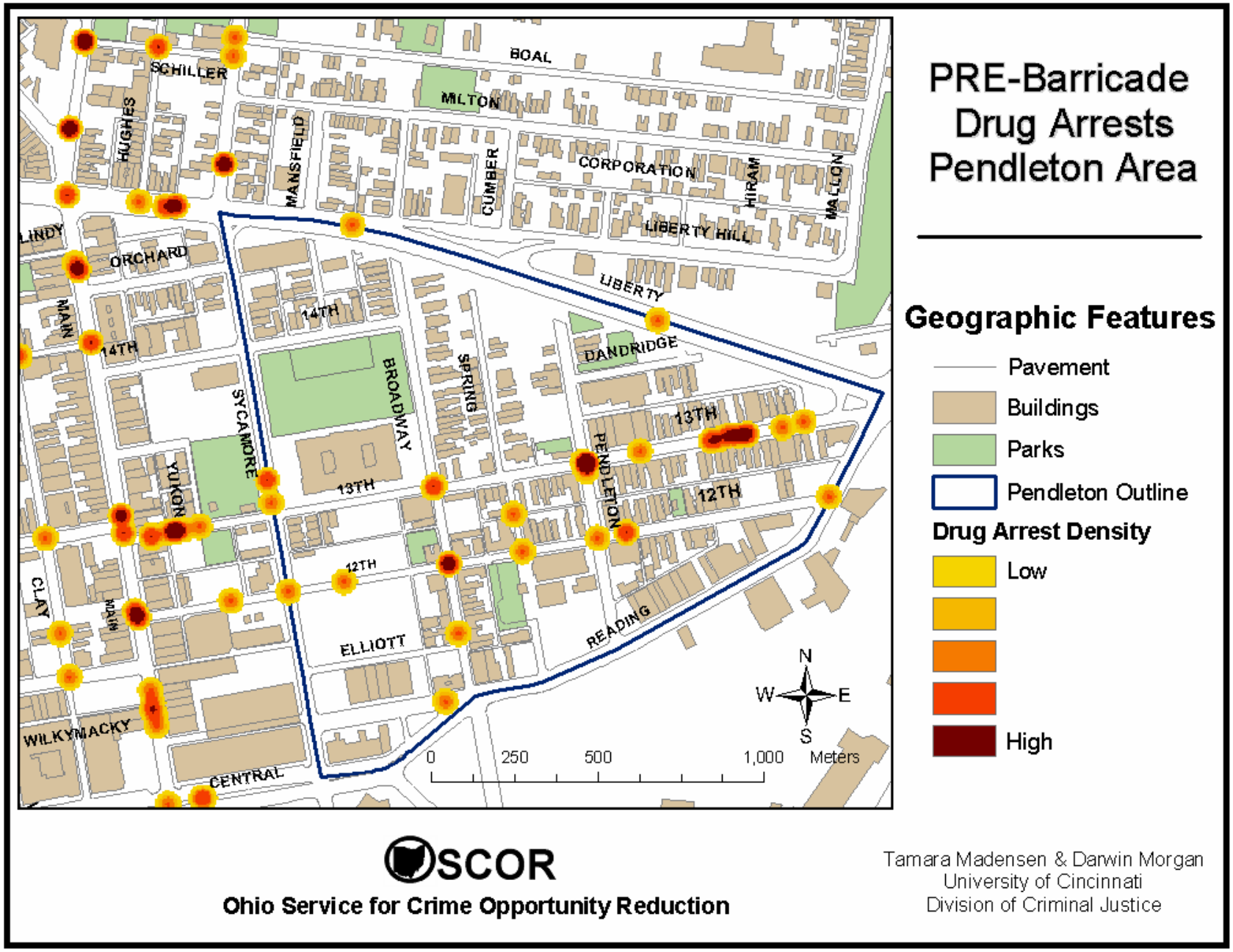
Division of Criminal Justice

APPENDIX E

DENSITY MAPS – DRUG ARRESTS IN PENDLETON


PRE-Barricade
Drug Arrests
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
Drug Arrest Density
Low
High
BOAL
SCHILLER
MILTON
HUGHES
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LINDY
ORCHARD
LIBERTY HILL
LIBERTY
MAIN
14TH
BROADWAY
SPRING
DANDRIDGE
SYCAMORE
13TH
PENDLETON
12TH
YUKON
CLAY
ELLIOTT
READING
WILKYMACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
OSCOR
Ohio Service for Crime Opportunity Reduction
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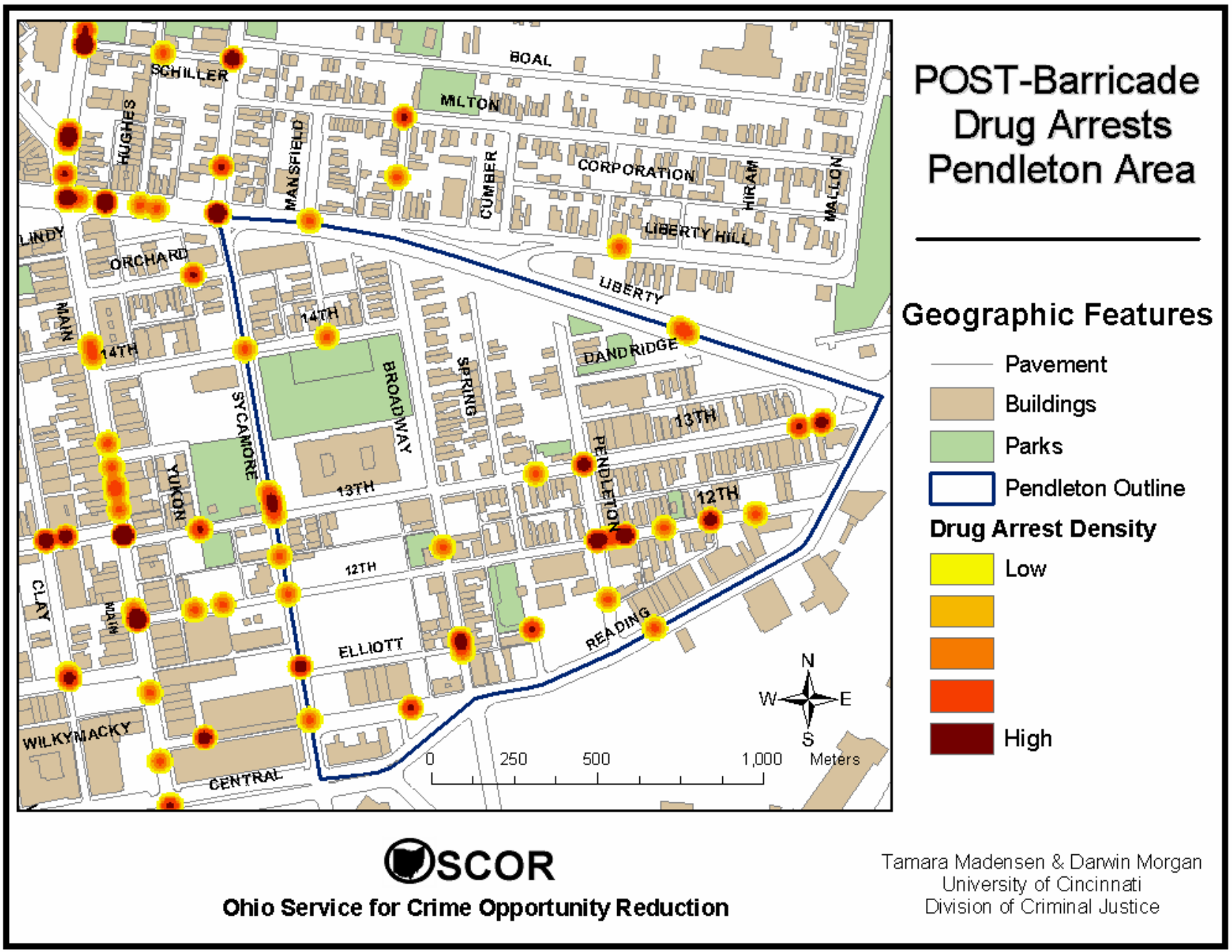
University of Cincinnati
Division of Criminal Justice


POST-Barricade
Drug Arrests
Pendleton Area
Geographic Features
Pavement
Buildings
Parks
Pendleton Outline
Drug Arrest Density
Low
High
BOAL
SCHILLER
MILTON
HUGHES
MANSFIELD
CUMBER
CORPORATION
HIRAM
MALLON
LIBERTY HILL
LINDY
ORCHARD
LIBERTY
MAIN
14TH
DANDRIDGE
BROADWAY
SPRING
SYCAMORE
13TH
PENDLETON
YUKON
12TH
CLAY
MAIN
ELLIOTT
READING
WILKYMACKY
CENTRAL
N
W
E
S
0
250
500
1,000
Meters
OSCOR
Ohio Service for Crime Opportunity Reduction
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University of Cincinnati
Division of Criminal Justice

APPENDIX F

TABLES – OFFENSES BY DATASET[18]

[18] Only offenses that could theoretically be influenced by the barricade are included in the tables.

CALLS FOR SERVICE TABLES

PENDLETON CFS

OFFENSE	PRE	POST	DIFF
ASSAULT	33	27	-6
DISORDERLY PERSON OR CROWD	60	46	-14
PERSON CUT	4	0	-4
FIGHT	10	9	-1
PERSON WITH GUN	23	20	-3
MENACING	17	17	0
POLICE OFFICER NEEDS ASSISTANCE	1	0	-1
ROBBERY	5	6	+1
PERSON SHOT	5	2	-3
POSSIBLE SHOTS FIRED	10	43	+33
PERSON WITH WEAPON	4	5	+1
DRUG USE/SALE	18	14	-4
CRIMINAL DAMAGE	13	19	+6
SUSPICIOUS PERSON OR AUTO	27	26	-1
AUTO ACCIDENT	60	44	-16
AUTO THEFT	30	25	-5
TRAFFIC HAZARD	24	41	+17
CAR IN VIOLATION	69	77	+8
TRAFFIC POST	0	1	+1

13^{TH} STREET 500 BLOCK CFS

OFFENSE	PRE	POST	DIFF
ASSAULT	7	5	-2
DISORDERLY PERSON OR CROWD	9	9	0
PERSON CUT	2	0	-2
FIGHT	3	1	-2
PERSON WITH GUN	7	4	-3
MENACING	2	7	+5
ROBBERY	1	1	0
PERSON SHOT	4	0	-4
POSSIBLE SHOTS FIRED	5	4	-1
PERSON WITH WEAPON	1	3	+2
DRUG USE/SALE	9	0	-9
CRIMINAL DAMAGE	2	2	0
SUSPICIOUS PERSON OR AUTO	1	1	0
AUTO ACCIDENT	5	2	-3
AUTO THEFT	2	3	+1
TRAFFIC HAZARD	1	3	+2
CAR IN VIOLATION	7	4	-3

12TH STREET 500 BLOCK CFS

OFFENSE	PRE	POST	DIFF
ASSAULT	3	6	+3
DISORDERLY PERSON OR CROWD	7	10	+3
PERSON CUT	1	0	-1
FIGHT	1	2	+1
PERSON WITH GUN	2	3	+1
POLICE OFFICER NEEDS ASSISTANCE	1	0	-1
PERSON SHOT	1	1	0
POSSIBLE SHOTS FIRED	0	21	+21
DRUG USE/SALE	1	9	+8
CRIMINAL DAMAGE	1	1	0
SUSPICIOUS PERSON OR AUTO	1	5	+4
AUTO ACCIDENT	5	3	-2
AUTO THEFT	4	2	-2
TRAFFIC HAZARD	2	1	-1
CAR IN VIOLATION	2	11	+9
TRAFFIC POST	0	1	+1

PART 1 CRIME TABLES

PENDLETON P1 CRIME

OFFENSE	PRE	POST	DIFF
AGGRAVATED ROBBERY	4	3	-1
FELONIOUS ASSAULT	10	5	-5
ROBBERY	4	2	-2
THEFT OF LICENSE PLATE(S)	1	1	0
UNAUTHORIZED USE OF MOTOR VEHICLE	0	2	+2
VEHICLE THEFT	17	8	-9

13TH STREET 500 BLOCK P1 CRIME

OFFENSE	PRE	POST	DIFF
AGGRAVATED ROBBERY	1	0	-1
FELONIOUS ASSAULT	3	0	-3
VEHICLE THEFT	2	0	-2

12TH STREET 500 BLOCK P1 CRIME

OFFENSE	PRE	POST	DIFF
FELONIOUS ASSAULT	1	1	0
THEFT OF LICENSE PLATE(S)	0	1	+1
VEHICLE THEFT	0	1	+1

PART 2 CRIME TABLES

PENDLETON P2 CRIME

OFFENSE	PRE	POST	DIFF
AGGRAVATED MENACING	2	0	-2
ASSAULT	16	11	-5
CRIMINAL DAMAGING/ENDANGERING	19	26	+7
CRIMINAL MISCHIEF	0	2	+2
INTIMIDATION	0	1	+1
MENACING BY STALKING	1	0	-1

13TH STREET 500 BLOCK P2 CRIME

OFFENSE	PRE	POST	DIFF
AGGRAVATED MENACING	0	1	+1
ASSAULT	3	4	+1
CRIMINAL DAMAGING/ENDANGERING	1	4	+3

12TH STREET 500 BLOCK P2 CRIME

OFFENSE	PRE	POST	DIFF
ASSAULT	2	1	-1
CRIMINAL DAMAGING/ENDANGERING	3	2	-1

PART 1 ARREST TABLES

PENDLETON P1 ARRESTS

OFFENSE	PRE	POST	DIFF
ATTEMPTED AUTO THEFT	1	0	-1
FELONIOUS ASSAULT	8	1	-7

13TH STREET 500 BLOCK P1 ARRESTS

OFFENSE	PRE	POST	DIFF
FELONIOUS ASSAULT	3	0	-3

12TH STREET 500 BLOCK P1 ARRESTS

OFFENSE	PRE	POST	DIFF
FELONIOUS ASSAULT	1	0	-1

PART 2 ARREST TABLES

PENDLETON P2 ARRESTS

OFFENSE	PRE	POST	DIFF
AGGRAVATED MENACING	2	1	-1
ASSAULT	6	0	-6
CARRYING CONCEALED WEAPONS	6	5	-1
CRIMINAL DAMAGE OR ENDANGERMENT	1	3	+2
CRIMINAL MISCHIEF	0	1	+1
DISCHARGING FIREARMS	1	0	-1
DISORDERLY CONDUCT	7	27	+20
DRUG ABUSE SCHEDULE 1 2	11	8	-3
DRUG ABUSE SCHEDULE 3 4 5	1	0	-1
ILLEGAL WEAPON POSSESSION	1	4	+3
ILLEGAL POSSESSION-PRESCRIPTION DRUG	1	0	-1
INTIMIDATE VICTIM OR WITNESS	0	1	+1
MENACING BY STALKING	1	0	-1
NO CRIMINAL RECORD	16	28	+12
COUNTERFEIT CONTROLLED SUBSTANCE	1	0	-1
POSSESSION OF DRUG PARAPHERNALIA	2	10	+8
POSSESSION OF OPEN FLASK	5	17	+12
RECEIVING STOLEN MOTOR VEHICLE	6	0	-6
RESISTING ARREST	2	2	0
TRAFFICKING	10	3	-7

13^{TH} STREET 500 BLOCK P2 ARRESTS

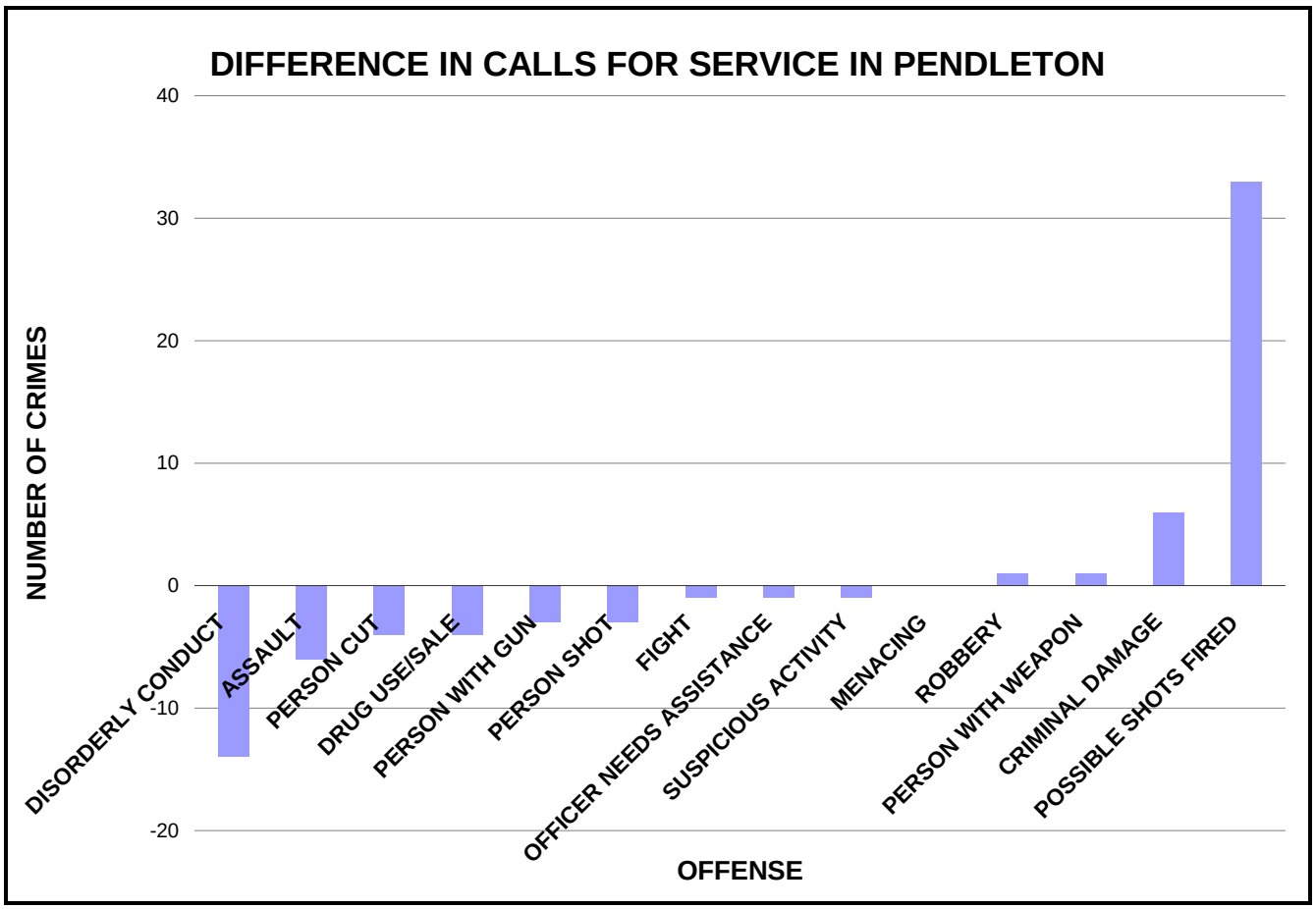
OFFENSE	PRE	POST	DIFF
AGGRAVATED MENACING	0	1	+1
CARRYING CONCEALED WEAPON	2	1	-1
CRIMINAL DAMAGE OR ENDANDERMENT	0	1	+1
DISCHARGING FIREARMS	1	0	-1
DISORDERLY CONDUCT	1	0	-1
DRUG ABUSE SCHEDULE 1 2	5	1	-4
ILLEGAL WEAPON POSSESSION	1	0	-1
ILLEGAL POSSESSION-PRESCRIPTION DRUG	1	0	-1
INTIMIDATE VICTIM OR WITNESS	0	1	+1
NO CRIMINAL RECORD	7	2	-5
COUNTERFEIT CONTROLLED SUBSTANCE	1	0	-1
POSSESSION OF DRUG PARAPHERNALIA	0	2	+2
POSSESSION OF OPEN FLASK	0	1	+1
RECEIVING STOLEN MOTOR VEHICLE	1	0	-1
RESISTING ARREST	1	0	-1
TRAFFICKING	5	0	-5

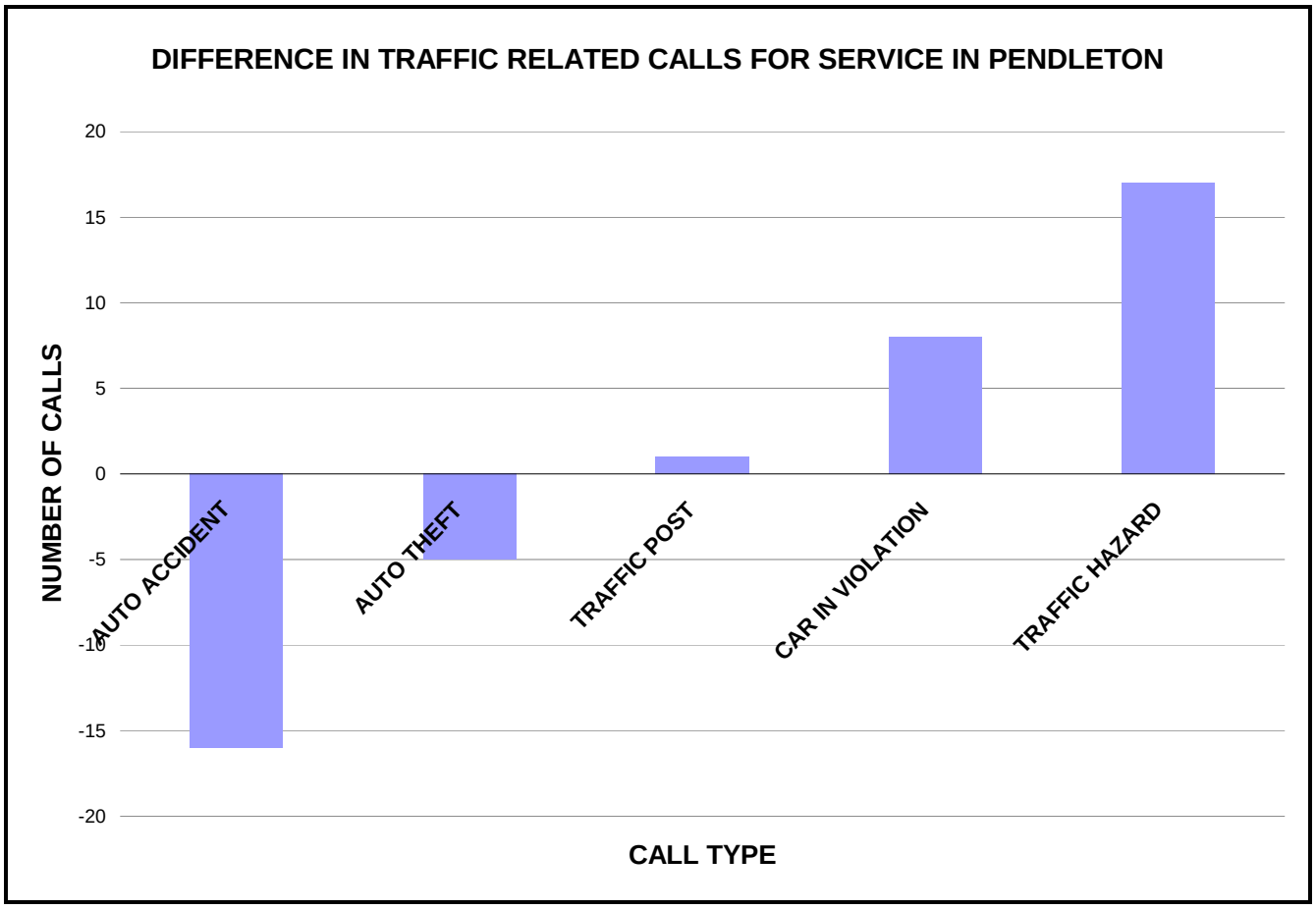
12TH STREET 500 BLOCK P2 ARRESTS

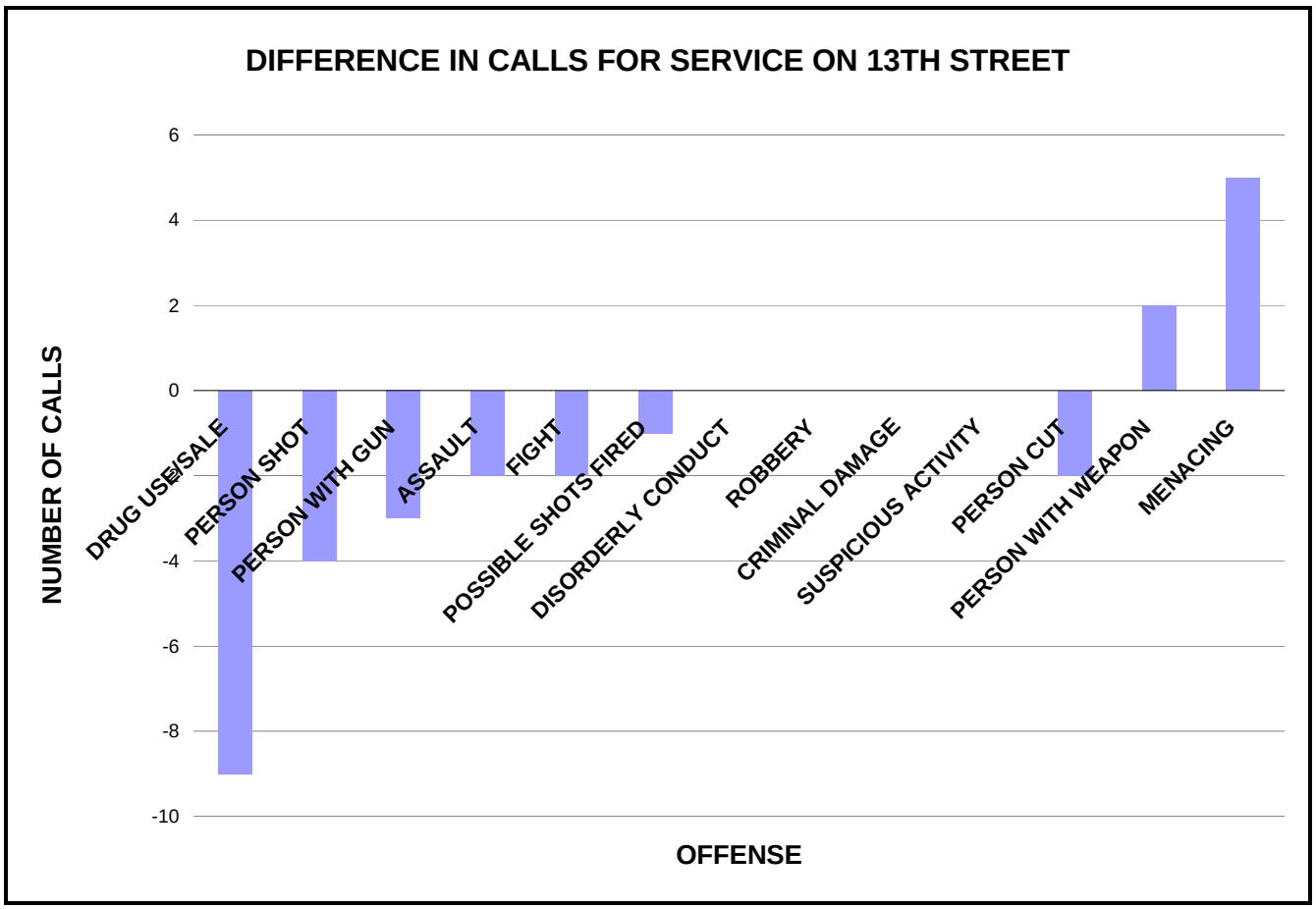
OFFENSE	PRE	POST	DIFF
ASSAULT	1	0	-1
CARRYING CONCEALED WEAPON	1	2	+1
CRIMINAL DAMAGE OR ENDANGERMENT	0	1	+1
DISORDERLY CONDUCT	1	1	0
DRUG ABUSE SCHEDULE 1 2	1	5	+4
ILLEGAL WEAPON POSSESSION	0	2	+2
NO CRIMINAL RECORD	1	5	+4
POSSESSION OF DRUG PARAPHERNALIA	0	2	+2
POSSESSION OF OPEN FLASK	1	1	0
TRAFFICKING	1	3	+2

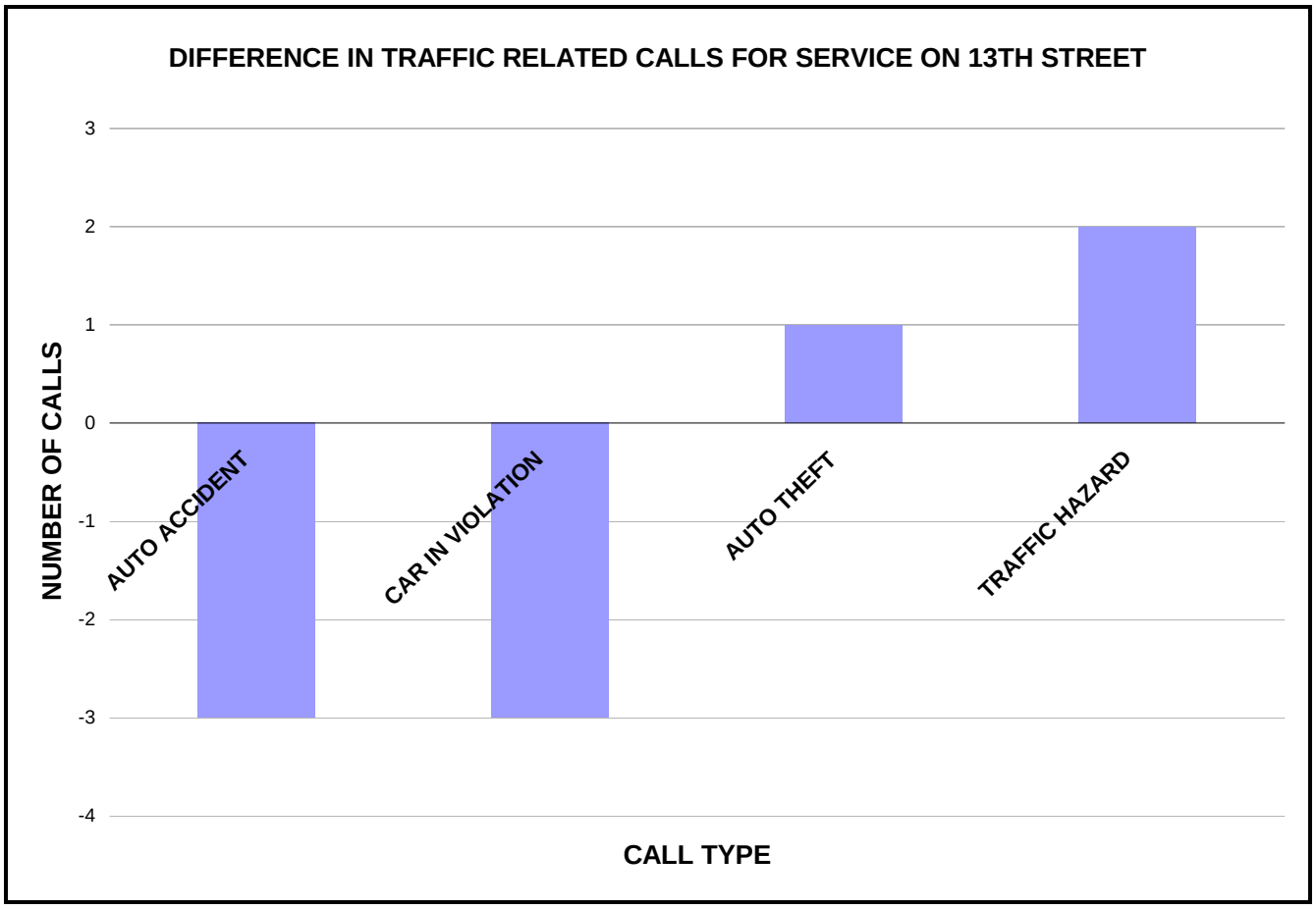
APPENDIX G

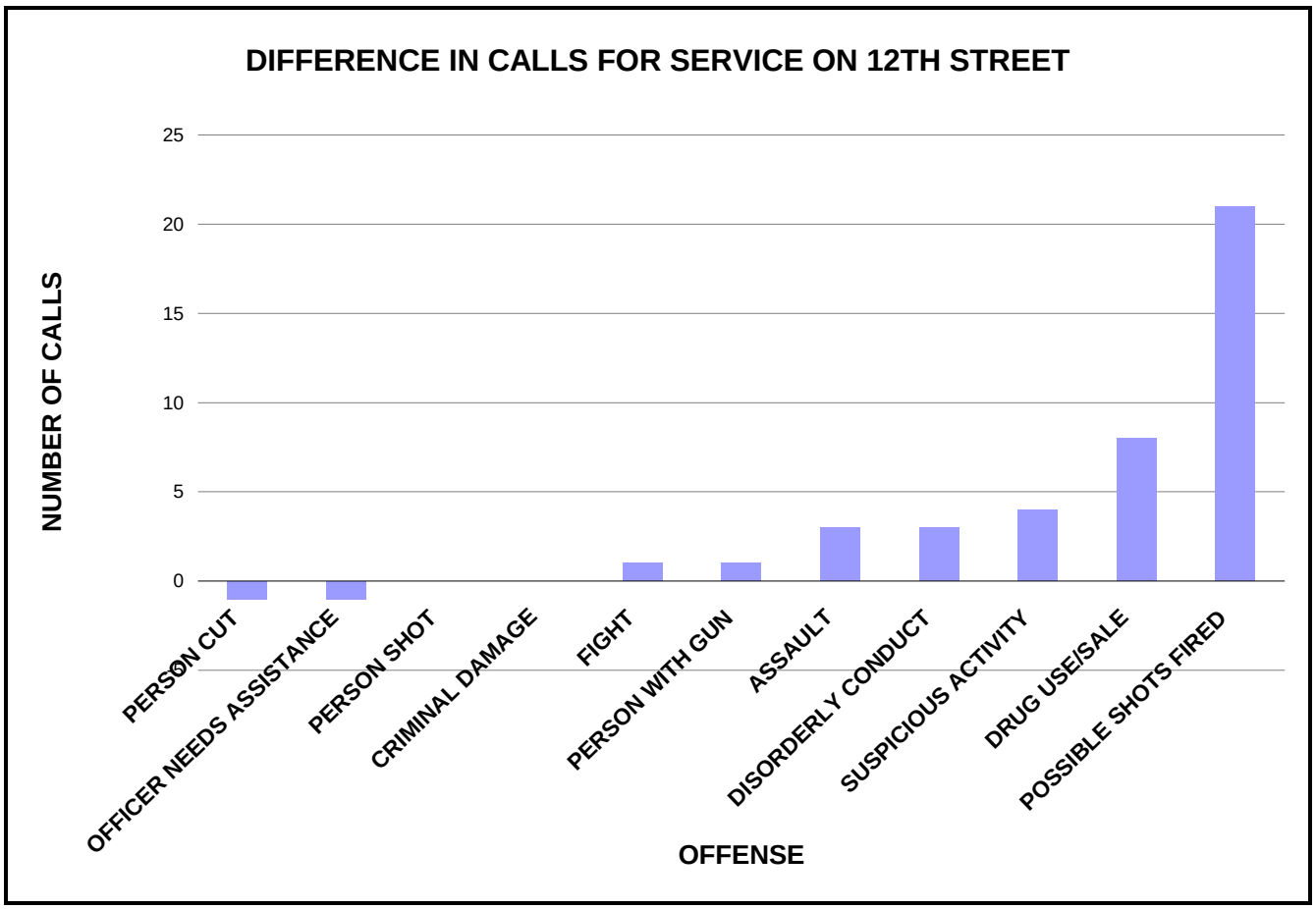
GRAPHS – DIFFERENCE IN OFFENSES

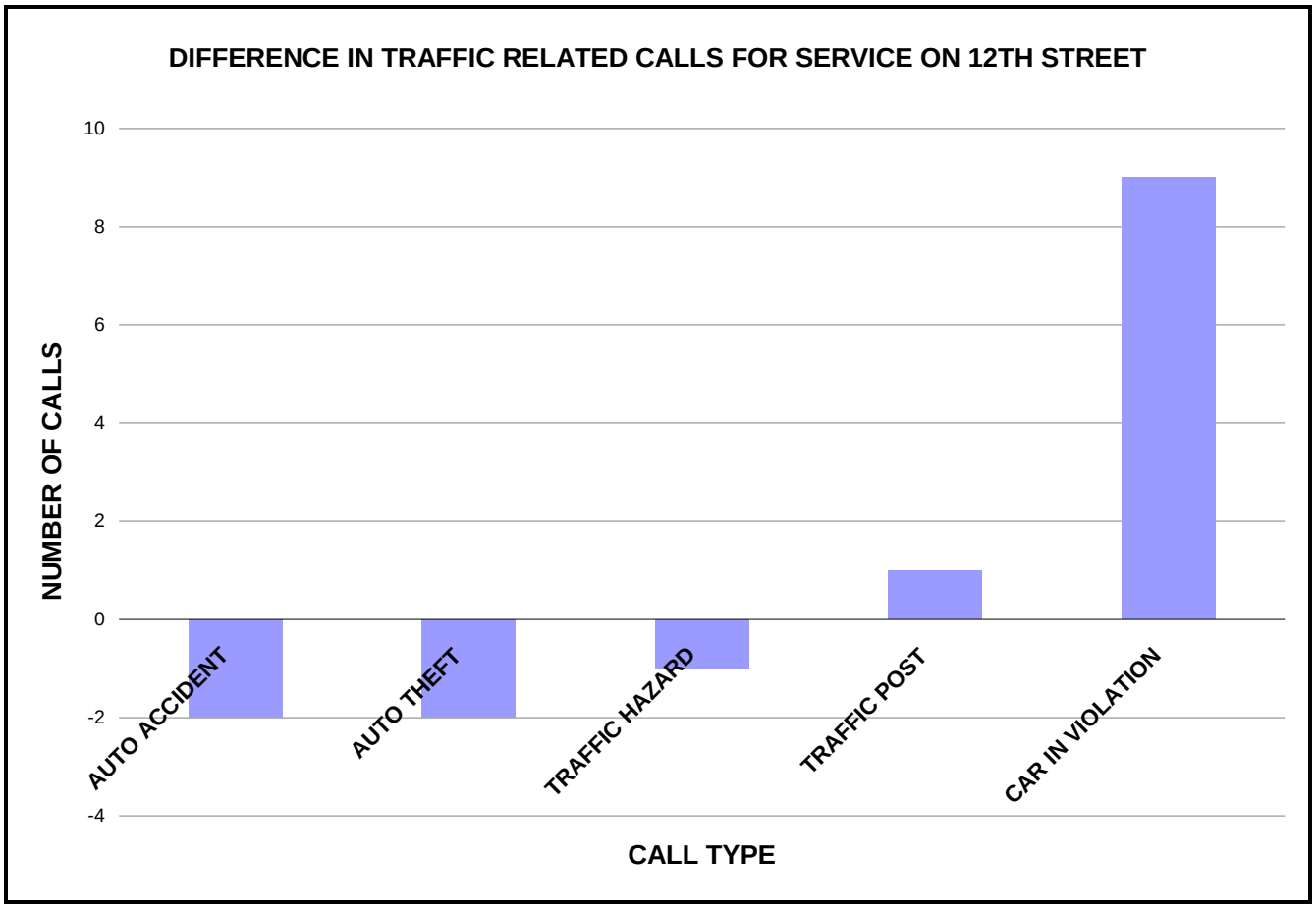

DIFFERENCE IN CALLS FOR SERVICE IN PENDLETON
NUMBER OF CRIMES
40
30
20
10
0
-10
-20
DISORDERLY CONDUCT
ASSAULT
PERSON CUT
DRUG USE/SALE
PERSON WITH GUN
PERSON SHOT
FIGHT
OFFICER NEEDS ASSISTANCE
SUSPICIOUS ACTIVITY
MENACING
ROBBERY
PERSON WITH WEAPON
CRIMINAL DAMAGE
POSSIBLE SHOTS FIRED
OFFENSE

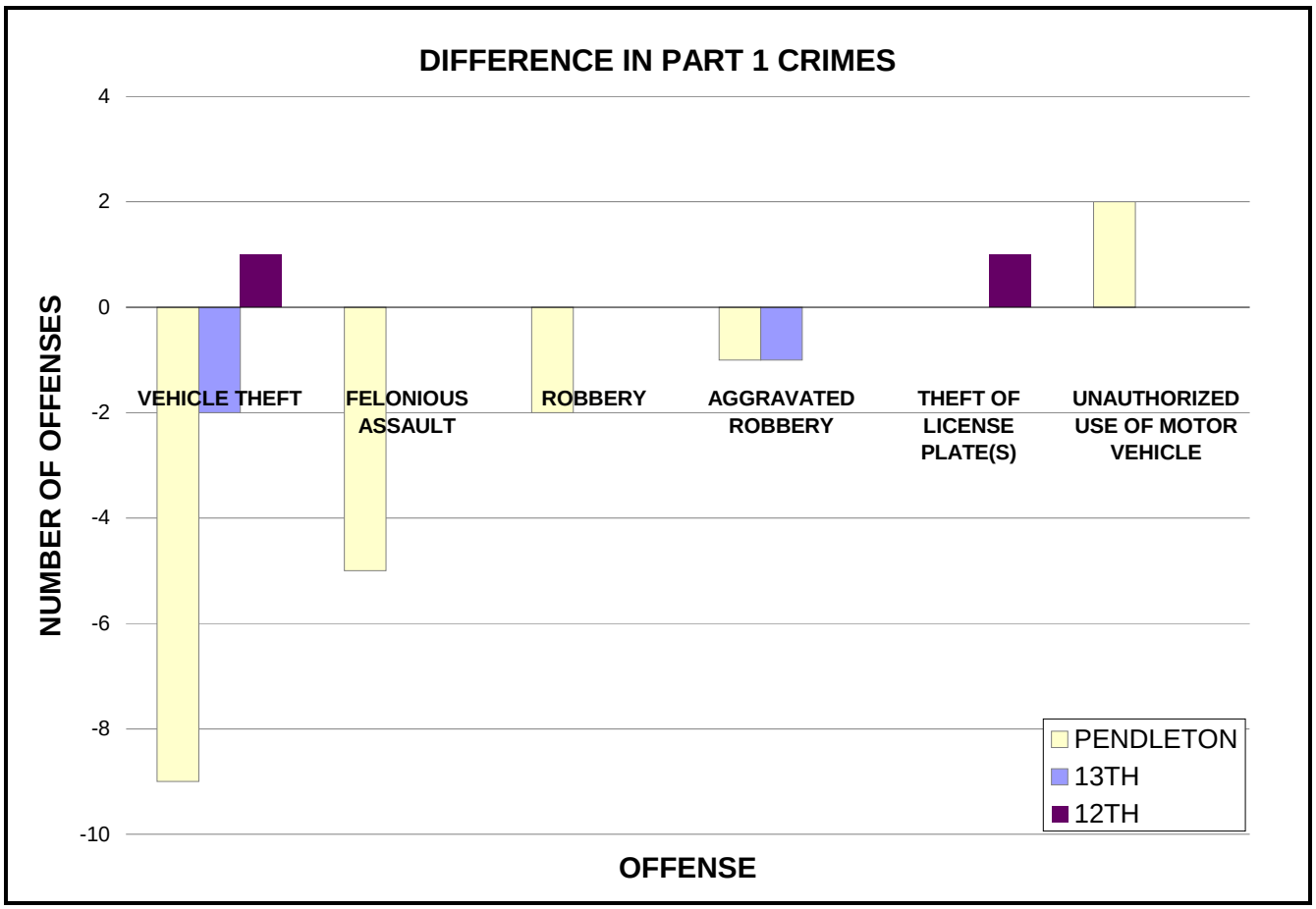

DIFFERENCE IN TRAFFIC RELATED CALLS FOR SERVICE IN PENDLETON
NUMBER OF CALLS
20
15
10
5
0
-5
-10
-15
-20
AUTO ACCIDENT
AUTO THEFT
TRAFFIC POST
CAR IN VIOLATION
TRAFFIC HAZARD
CALL TYPE

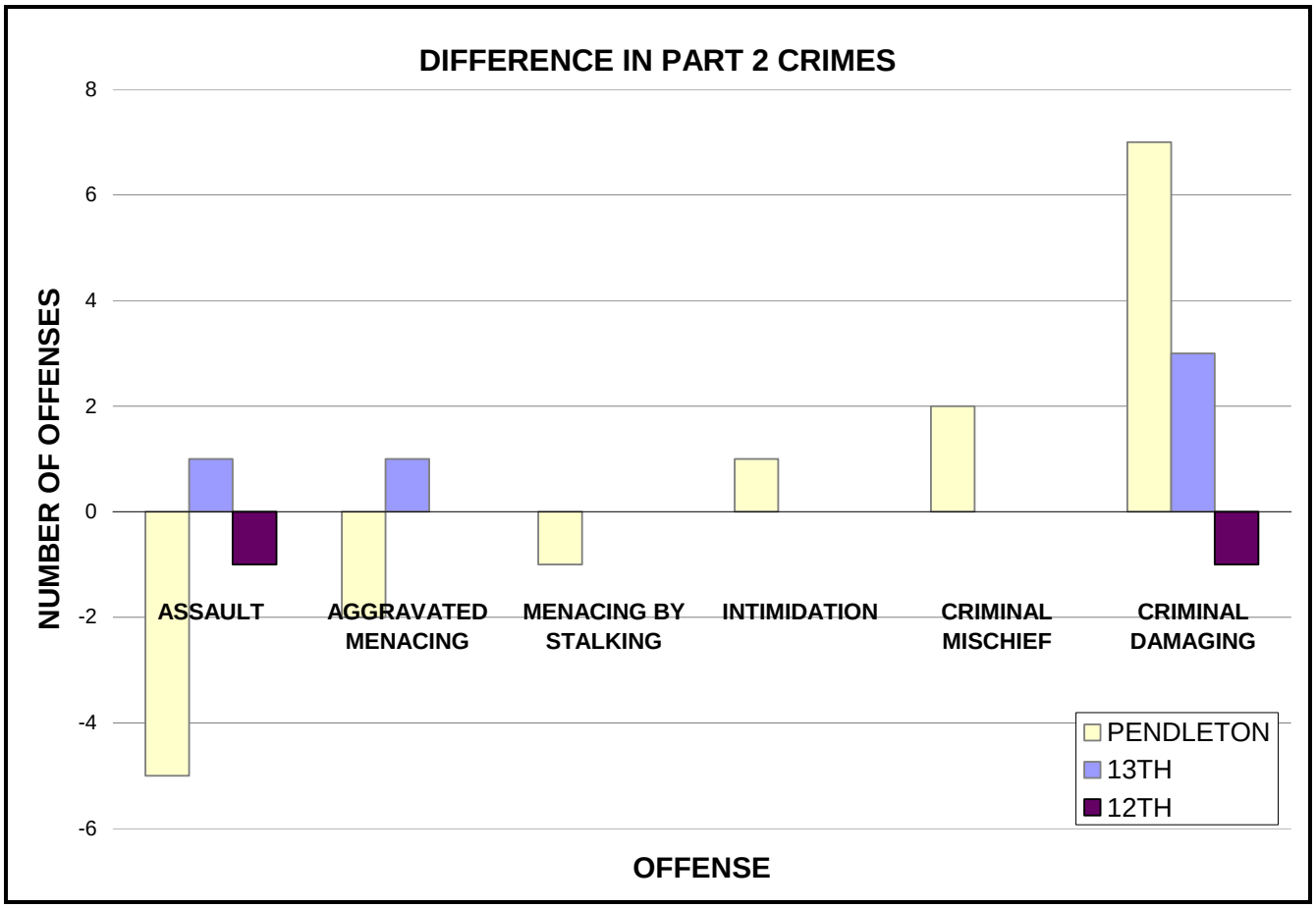

DIFFERENCE IN CALLS FOR SERVICE ON 13TH STREET
NUMBER OF CALLS
6
4
2
0
-4
-6
-8
-10
DRUG USE/SALE
PERSON SHOT
PERSON WITH GUN
ASSAULT
FIGHT
POSSIBLE SHOTS FIRED
DISORDERLY CONDUCT
ROBBERY
CRIMINAL DAMAGE
SUSPICIOUS ACTIVITY
PERSON CUT
PERSON WITH WEAPON
MENACING
OFFENSE

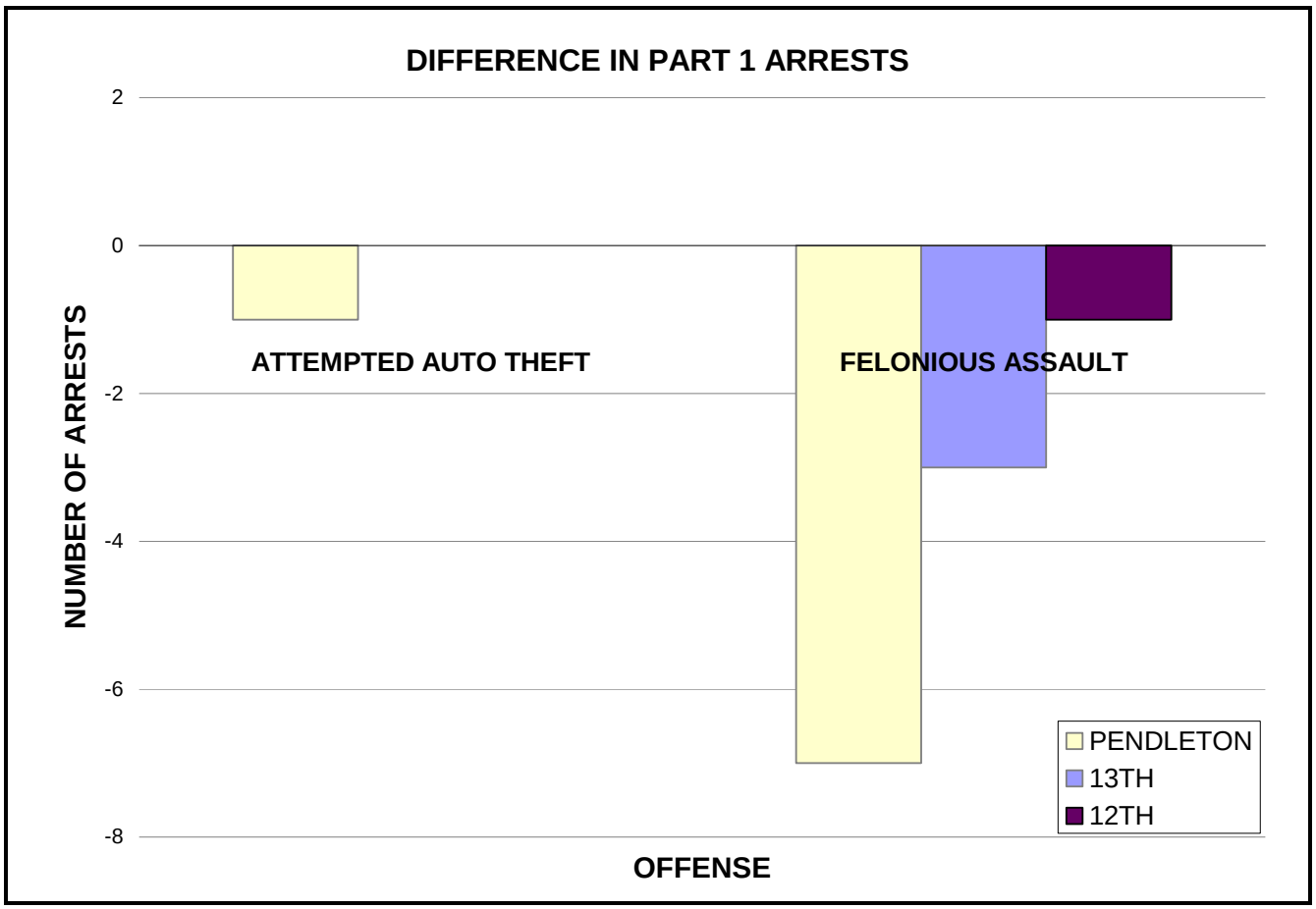

DIFFERENCE IN TRAFFIC RELATED CALLS FOR SERVICE ON 13TH STREET
NUMBER OF CALLS
3
2
1
0
-1
-2
-3
-4
AUTO ACCIDENT
CAR IN VIOLATION
AUTO THEFT
TRAFFIC HAZARD
CALL TYPE

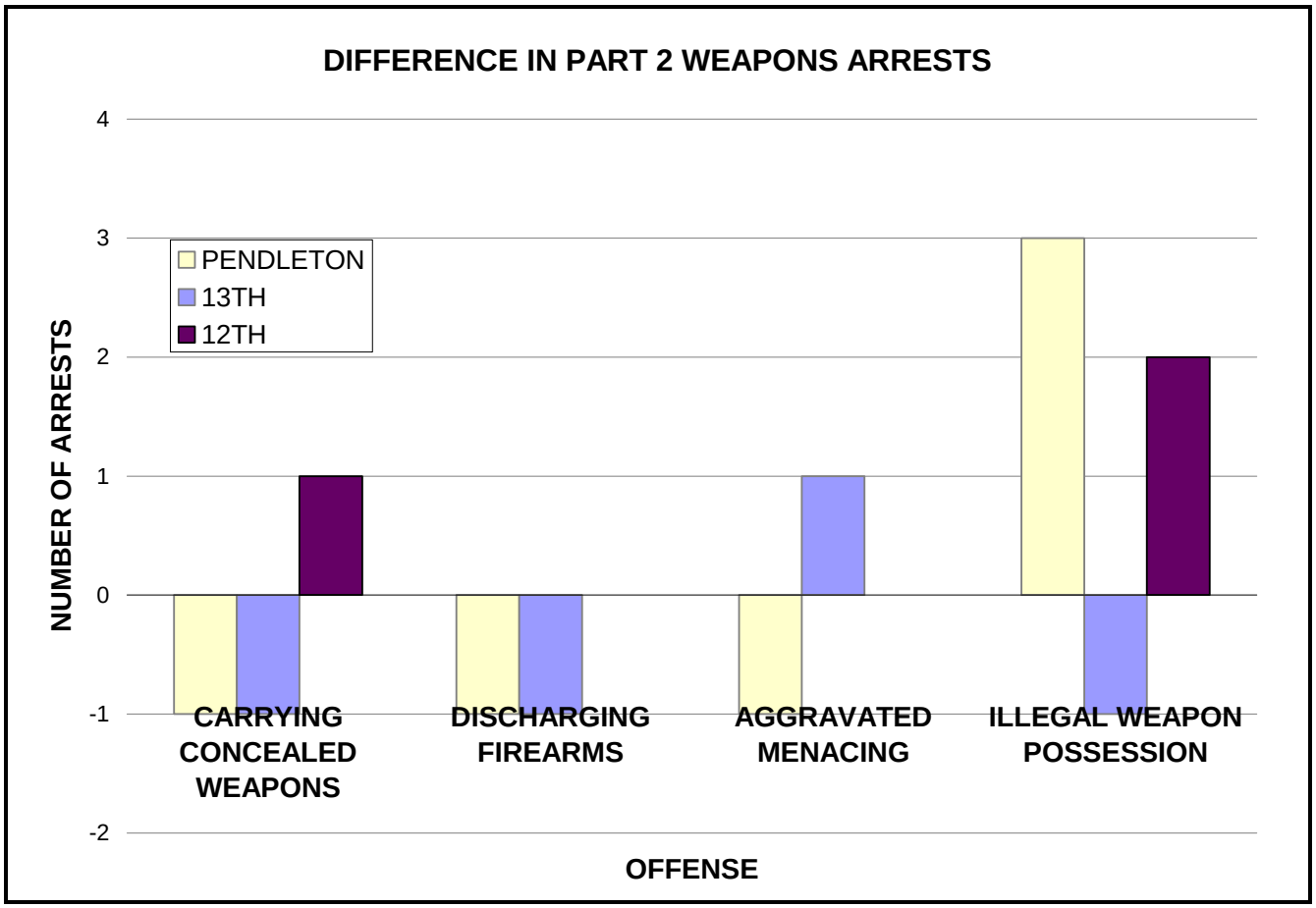

DIFFERENCE IN CALLS FOR SERVICE ON 12TH STREET
NUMBER OF CALLS
25
20
15
10
5
0
PERSON CUT
OFFICER NEEDS ASSISTANCE
PERSON SHOT
CRIMINAL DAMAGE
FIGHT
PERSON WITH GUN
ASSAULT
DISORDERLY CONDUCT
SUSPICIOUS ACTIVITY
DRUG USE/SALE
POSSIBLE SHOTS FIRED
OFFENSE

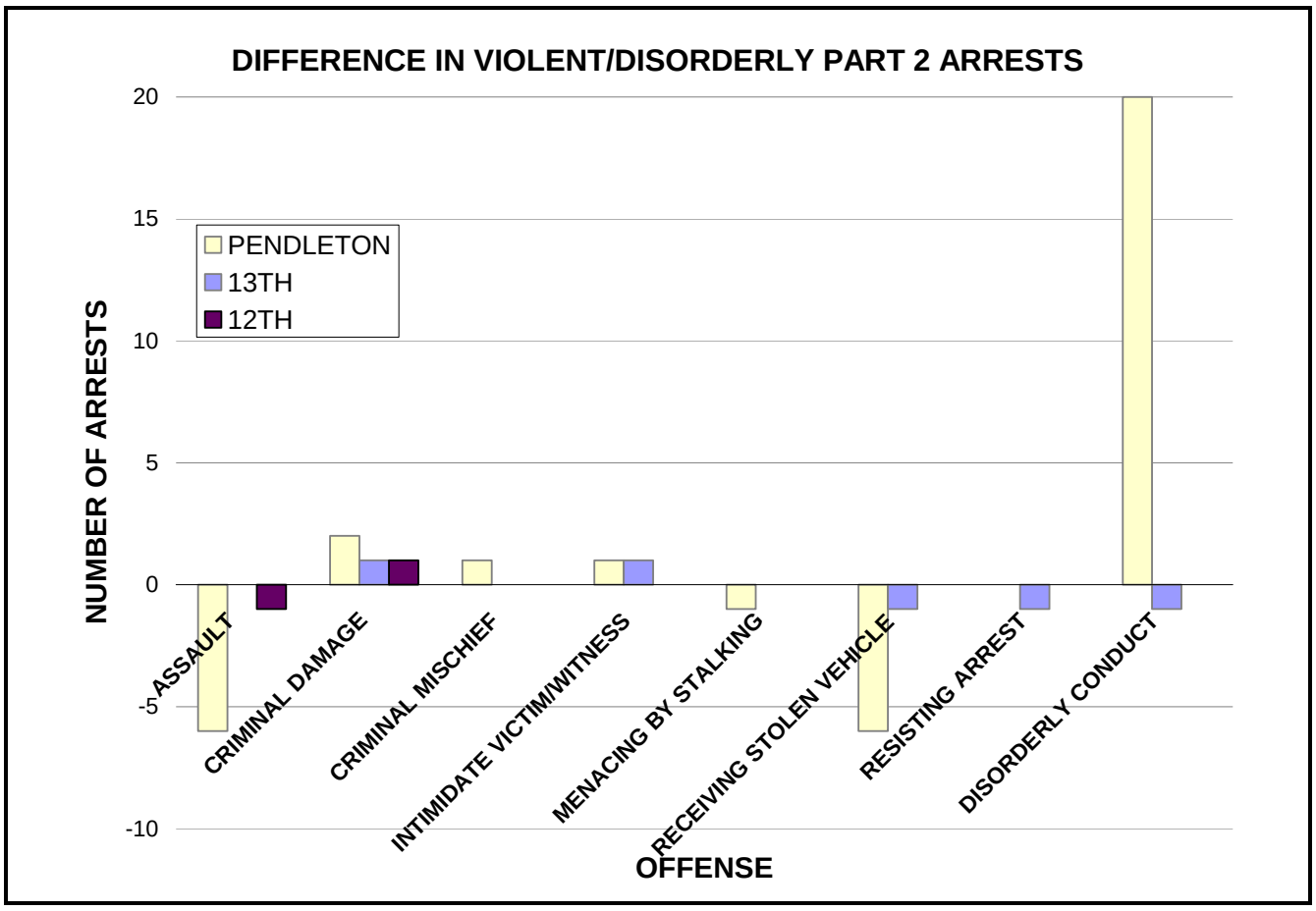

DIFFERENCE IN TRAFFIC RELATED CALLS FOR SERVICE ON 12TH STREET
NUMBER OF CALLS
10
8
6
4
2
0
-2
-4
AUTO ACCIDENT
AUTO THEFT
TRAFFIC HAZARD
TRAFFIC POST
CAR IN VIOLATION
CALL TYPE

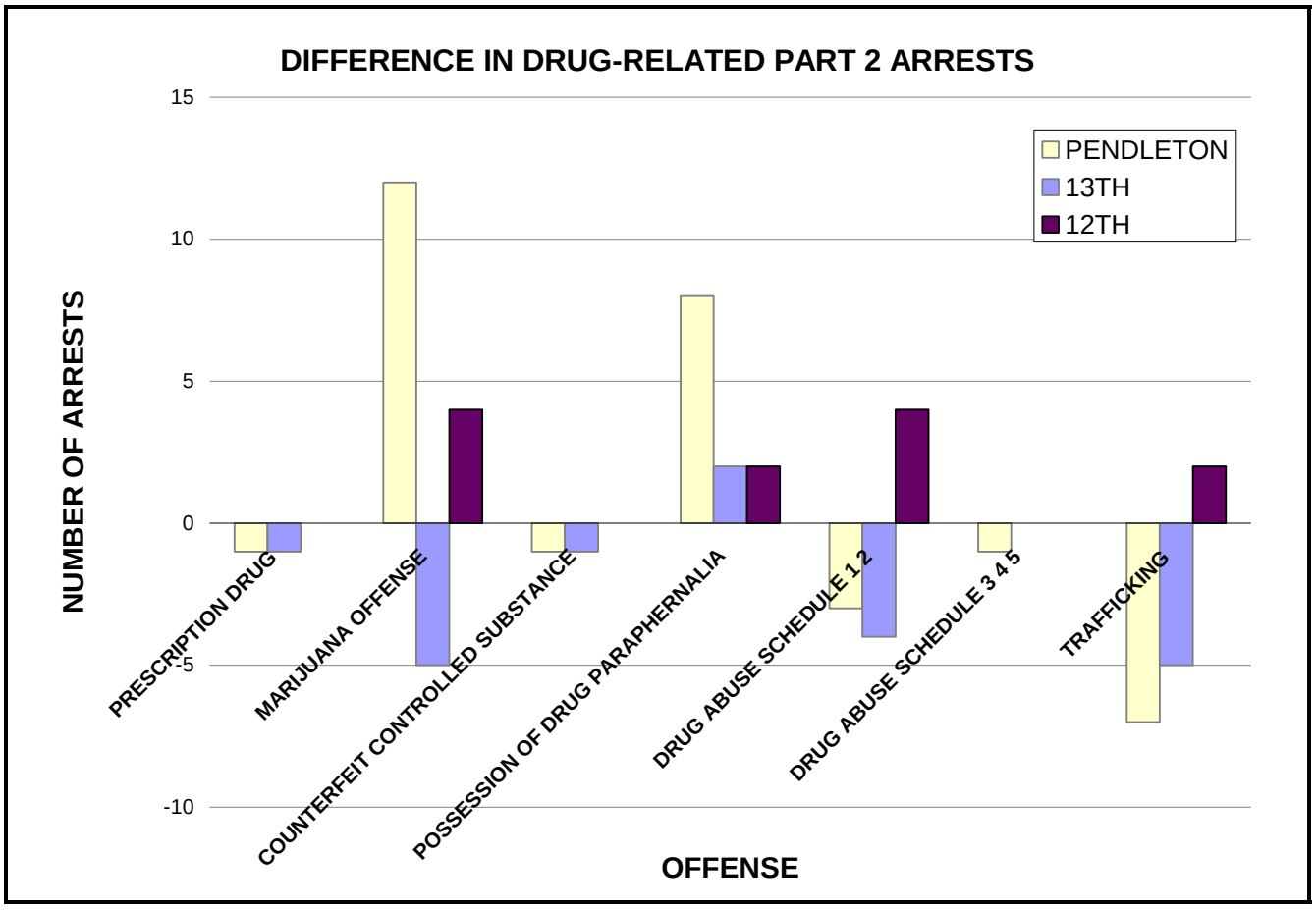

DIFFERENCE IN PART 1 CRIMES
NUMBER OF OFFENSES
4
2
0
-2
-4
-6
-8
-10
VEHICLE THEFT
FELONIOUS ASSAULT
ROBBERY
AGGRAVATED ROBBERY
THEFT OF LICENSE PLATE(S)
UNAUTHORIZED USE OF MOTOR VEHICLE
PENDLETON
13TH
12TH
OFFENSE


DIFFERENCE IN PART 2 CRIMES
NUMBER OF OFFENSES
8
6
4
2
0
-2
-4
-6
ASSAULT
AGGRAVATED MENACING
MENACING BY STALKING
INTIMIDATION
CRIMINAL MISCHIEF
CRIMINAL DAMAGING
PENDLETON
13TH
12TH
OFFENSE


DIFFERENCE IN PART 1 ARRESTS
2
0
-2
-4
-6
-8
NUMBER OF ARRESTS
ATTEMPTED AUTO THEFT
FELONIOUS ASSAULT
PENDLETON
13TH
12TH
OFFENSE


DIFFERENCE IN PART 2 WEAPONS ARRESTS
4
3
2
1
0
-1
-2
NUMBER OF ARRESTS
PENDLETON
13TH
12TH
CARRYING CONCEALED WEAPONS
DISCHARGING FIREARMS
AGGRAVATED MENACING
ILLEGAL WEAPON POSSESSION
OFFENSE


DIFFERENCE IN VIOLENT/DISORDERLY PART 2 ARRESTS
NUMBER OF ARRESTS
20
15
10
5
0
-5
-10
PENDLETON
13TH
12TH
ASSAULT
CRIMINAL DAMAGE
CRIMINAL MISCHIEF
INTIMIDATE VICTIM/WITNESS
MENACING BY STALKING
RECEIVING STOLEN VEHICLE
RESISTING ARREST
DISORDERLY CONDUCT
OFFENSE


DIFFERENCE IN DRUG-RELATED PART 2 ARRESTS
NUMBER OF ARRESTS
15
10
5
0
-5
-10
PENDLETON
13TH
12TH
PRESCRIPTION DRUG
MARIJUANA OFFENSE
COUNTERFEIT CONTROLLED SUBSTANCE
POSSESSION OF DRUG PARAPHERNALIA
DRUG ABUSE SCHEDULE 1 2
DRUG ABUSE SCHEDULE 3 4 5
TRAFFICKING
OFFENSE