HAMILTON POLICE SERVICE

An Overview of
Violence-Prone Areas in Hamilton

Three Years Later

Debbie Gifford
Corporate Planning Branch
May 6, 2013

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

I.   BACKGROUND

The Neighbourhood Safety Program (NSP), the Hamilton Police Service's (HPS) frontline policing model, was implemented Service-wide in 2006. The overall priorities of NSP are to achieve crime, disorder and fear of crime reduction; increase traffic safety, community mobilization and provide a safer working environment for our officers.

NSP, although recognized as a successful best practice, lacked sufficient resources to draw upon during spikes of violent crime and disorder. In attempt to address this shortcoming, in 2008 and 2009, HPS used the PAVIS grants to bolster the Guns and Weapons Enforcement Unit and address gang activities. In 2010, upon comprehensive research, the PAVIS funding was re-invested into the ACTION strategy. NSP and ACTION are predicated on the Broken Windows Theory - the notion that addressing quality of life issues and social disorder will prevent more serious crime.

The ACTION strategy is the next step in the evolution of NSP – the made in Hamilton integrated approach to community policing.

II. INTRODUCTION

This study essentially replicates the methodology used in the initial analysis *An Overview of Violence-Prone Areas in Hamilton* (Gifford 2010), with updated data from 2012. The purpose of this study, similar to the initial study, is to evaluate any

changes to the identified areas of violence in Hamilton and to support evidence-based deployment of resources.

III. METHODOLOGY

The data used for this hot spot and cluster analysis includes Shooting and Robbery crime incidents as well as violent calls-for-service categorized as follows:

Group 1: Homicide, Shooting, Stabbing, Person with Weapon, Robbery and Sexual Assault

Group 2: Assault

Group 3: Priority Zero

ArcGIS 10.0 and Crime Analyst extension were used to create the density maps. The area with the most intense clustering was identified based on the intersection of Violent (Group 1), Assault (Group 2) and Robbery hot spots. A second cluster analysis method was applied to the data to confirm identified patterns. Density maps were created within the violence-prone area and the number of events in each of the target areas were calculated. Temporal analysis was conducted using the events within the violence-prone area.

IV. SUMMARY OF FINDINGS

A.   VIOLENT, PROPERTY & OTHER CRIMES COMPARISON

1.   In 2012, 37.7% of the violent crimes that occurred in the City of Hamilton were in Division 1. This compares to 32.2% in Division 2 and 28.5% in Division 3. The remaining 1.6% could not be assigned to a Division.

2.   This same pattern showing a higher percentage of violent crime occurring in Division 1 is also evident in the 2009 data with 39.4% in Division 1, 29.5% in Division 2 and 29.7% in Division 3 (1.4% could not be assigned to a Division).

3.   In contrast, the opposite is observed with property crimes. In 2012, 36.9% of the property crimes that occurred in the City of Hamilton were in Division 3. This compares to 30.9% in Division 1 and 30.5% in Division 2 (1.8% could not be assigned to a Division).

4.   This same pattern showing a higher percentage of property crime occurring in Division 3 is also evident in the 2009 data with 37.7% in Division 3, 31.2% in Division 2 and 29.5% in Division 1 (1.6% could not be assigned to a Division).

5.   Division 1 has the highest percentage of prostitution in 2012 (96.7%) and 2009 (77.8%) and Drug Crimes in 2012 (52.8%) and 2009 (42.0%).

6.   Over the past three years, violent (-19.1%), property (-13.8%) and prostitution (-43.5%) crimes show double digit decreases.

7.   Over the past three years, drug crimes increased 39.4% between 2009 and 2012 and this is most likely due to the enforcement nature of this crime.

B.   SOCIAL LANDSCAPE

8.   Many of the neighbourhoods identified in the Code Red study (Buist, 2010) are within the violence-prone area identified in this report.

9.   Eight priority neighbourhoods identified by the City of Hamilton as part of the Neighbourhood Development Strategy (City of Hamilton, 2012) are within the violence-prone area identified in this report.

C.   HOT SPOT ANALYSIS

Kernel Density

10.   The large hot spot of Violent calls-for-service below the escarpment visually appears smaller in 2012 when compared to the results from 2009.

11.   The intensity of the hot spots of Violent calls-for-service located on the mountain area appear to have diminished in 2012 when compared to the results found in 2009.

12.   Both the size and intensity of the smaller hot spots of Violent calls-for-service located in west Hamilton, east Hamilton and Stoney Creek have decreased.

13.   Similar observations are also apparent between hot spots that were calculated for the Assault calls-for-service and for the Robbery incidents using 2009 and 2012 data.

14.   The size of the core hot spot of Assault calls-for-service and Robbery incidents located below the escarpment is noticeably reduced.

15.   The hot spots of Assault calls-for-service and Robbery incidents located on the mountain and west Hamilton, east Hamilton and Stoney Creek appear both smaller and less concentrated.

16.   The size of the violence-prone area is visually reduced in 2012 and there are no peripheral areas on the mountain or in west or east Hamilton.

Getis-Ord Gi*

17.   The Getis-Ord Gi* (pronounce G-I-star) method of hot spot or cluster analysis results illustrate that the most intense clustering of events are mostly below the escarpment and, for the most part, in central Hamilton stretching into east Hamilton.

D. VIOLENCE-PRONE AREAS

Size

18.   The size of the violence-prone area calculated using 2012 data is 16.8 sq km and consumes 1.5% of the area of the City of Hamilton.

19.   When compared to the size of the hot spot calculated in 2009, the area has decreased by 36.4% and consumes a smaller portion (0.9% less) of the city.

Frequency and Density

20.   There are fewer events in both the violence-prone area and within the City of Hamilton in 2012 versus 2009, with the exception of Shooting incidents.

21.   There are fewer events per square kilometer within the City of Hamilton in 2012 for Violent calls-for-service, Assault calls-for-service and Robbery incidents and no change for Priority Zero calls-for-service and Shooting incidents when compared to 2009.

22.   There are more events per square kilometer in the violence-prone areas in 2012 for Violent calls-for-service, Assault calls-for-service and Shooting incidents and fewer Priority Zero calls-for-service and Robbery incidents per square kilometer when compared to 2009.

Hot Spots

23.   The most intense spatial clustering of the Violent calls-for-service is centered around the Downtown core at King Street / James Street, and along King Street / Tisdale Avenue between Victoria Street and just east of Wentworth Street.

24.   Smaller and less intense hot spots of Violent calls-for-service are visible surrounding the core to the north along James Street / Robert Street; to the west

around Hess Street; to the south on either side the James Street. A small hot spot is also located in the Barton Street / Sherman Avenue area.

25.   To a somewhat lesser degree, Violent calls-for-service are clustered along Barton Street; Wellington Avenue North, and; between Wentworth Street North and Sherman Avenue.

26.   Intense clustering of Assault calls-for-service is again centred around the King Street and James Street area.

27.   Larger more intense hot spots of Assault calls-for-service are evident in the Hess Street area; James Street North / Robert Street; along Barton Street between Catherine Street and Wellington Street, and; along King Street / Tisdale Street between Wellington Street and Wentworth Street and extending to the south towards the escarpment.

28.   The most intense clustering of Robbery events is located around King Street / James Street; along King Street / Tisdale Street between Victoria Avenue and Wentworth Street, and; along Sanford Avenue between Wilson and Barton Streets.

29.   Smaller and somewhat less intense hot spots of Robbery incidents are visible surrounding the core to the north along James Street / Robert Street; to the west around Hess Street; to the south on either side the James Street.

30.   Similar pockets of clusters of Robbery incidents are shown in areas just east of Sherman Avenue around Barnesdale Avenue / Barton Street; Barnesdale Avenue / Main Street; Gage Park area, and; the Centre Mall area.

E.   TARGET AREAS

Location

31.   There are ten target areas within the violence-prone area.

Frequency and Density

32. There has been a decrease in the number of events occurring in the target areas in 2012 for virtually all of the event types when compared to 2009 numbers.

33. The exceptions are noted in Hess Village, Wentworth / Lottrige and Wellington / West target areas where the number of Violent calls-for-service are slightly higher in 2012 when compared to 2009; Priority Zero calls-for-service in the Centre Mall and Oriole Crescent areas, and; Shooting incidents increased in Hess Village, Wentworth / Lottridge and Wellington / West target areas in 2012 when compared to 2009.

Rank Order

34. The rank order of the target areas based on volume and density of events using the three larger datasets (Violent and Assault calls-for-service and Robbery incidents) in 2012 is very similar to 2009; indicating that the highest concentration of violent events is centered around the downtown core.

F. TEMPORAL ANALYSIS

35. Between approximately 1400 hours to 1700 hours; from approximately 1900 hours to midnight there is an increase in the number of Violent calls-for-service with the pattern strengthening on Thursdays, Fridays and Saturday, and; from midnight to approximately 0400 hours on Saturdays and Sundays.

36. The number of Assault calls-for-service begin around 1400 hours to 2200 hours on Mondays, Tuesdays, Wednesdays; from 1700 to midnight on Thursdays, Fridays, Saturdays and Sundays, and; midnight to 0400 hours on Saturday and Sunday mornings.

37. There is no visible pattern to the Robbery incidents when examined by time.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis and findings presented in this study, the following recommendations are put forth:

1.   The strategy to focus police resources below the escarpment, in the downtown core and in the areas of high concentration of violent events while maintaining the flexibility to redeploy these resources, rapidly, to any location in within the City of Hamilton in response to a public safety concerns should be continued.

2.   As discussed in the findings, the intensity of several pockets of concentrated violent events identified in the 2009 study have decreased in 2012. While this is a positive impact, HPS should continue to monitor these areas for spikes or gradual increases in violent events.

3.   Further ongoing analysis should be conducted in the violence-prone areas to actively track all crime and disorder issues. These analysis should be balanced with the Service-wide situational crime variances and guide the deployment of officers to the areas of greatest need.

4.   As outlined in the findings of this report, the impact of the intervention strategies that were implemented between 2010 and 2012, are notable and evident Service-wide. These impacts and the interconnection of the strategies should be included in the HPS ongoing communication strategies. It is important to be clear that community engagement, crime prevention and enforcement are integral components of NSP. Strategies such as ACTION are built upon the NSP priorities and are not simply zero-tolerance enforcement initiatives.

I. BACKGROUND

In 2006, the Hamilton Police Service (HPS) implemented a new patrol deployment model known as the Neighbourhood Safety Program (NSP); with the goals of increasing efficiency, effectiveness, time for proactive policing, community engagement, internal & external communication and job satisfaction. The overall priorities are to achieve crime, disorder and fear of crime reduction; increase traffic safety, community mobilization and provide a safer working environment for our officers.

NSP, although recognized as a successful best practice, lacked sufficient resources for Crime Managers and Divisions to draw upon during spikes of violent crime and disorder. In attempt to address this shortcoming, in 2008 and 2009, HPS used the PAVIS grants to bolster the Guns and Weapons Enforcement Unit and address gang activities.

In 2010, upon comprehensive research, the PAVIS funding was re-invested into the ACTION strategy (Mason 2010). ACTION was implemented in May of 2010 to better address some of the more violence-prone pockets within the City of Hamilton. Pre and post-deployment studies were conducted to support evidence-based deployment of resources which is a critical component of the anti-violence initiative (Gifford 2010 & 2011).

NSP and ACTION strategies are predicated on the Broken Windows Theory – the notion that signs of incivility, like broken windows, signify that nobody cares, which leads to greater fear of crime and a reduction of community efficacy, which in

turn can lead to more serious crimes and greater signs of incivility, repeating the cycle of decay (Scheider, 2009). ACTION is also a victim-based strategy that provides assistance to vulnerable people such as the homeless, emotionally disturbed persons, street workers, people living in poverty and high crime neighbourhoods. ACTION officers address neighbourhood quality of life issues and social disorder with the intent of preventing more serious crime. The primary goal of Broken Windows is the development of informal social control mechanisms within the communities.

In essence, the application of the ACTION strategy is the next step in the evolution of NSP – the made-in-Hamilton integrated approach to community policing that incorporates initiatives such as community collaboration, intelligence-led policing, and a problem-oriented approach to resolving issues in neighbourhoods.

II. INTRODUCTION

The foundation of the ACTION Strategy is to deploy a mobile, highly visible, focused uniform presence in identified violence-prone neighbourhoods until violence in these neighbourhoods have declined and other NSP initiatives have become entrenched. The ultimate goal of this strategy is to reduce violence, disorder and the fear of crime in neighbourhoods.

To support this initiative, areas that were more prone to violence were identified in a study titled *An Overview of Violence-Prone Areas in Hamilton* (Gifford 2010). This approach supported evidence-based deployment of resources which is a critical component of this rapid response initiative.

A second study was conducted six-months after the deployment of ACTION. In *An Overview of Violence-Prone Areas in Hamilton, Post Deployment* (Gifford 2010), changes to the trends and patterns of violent crime were examined using the same data elements that were referenced in the initial study. This study actually served as a temperature gauge for the ACTION deployment and was used to confirm the deployment strategy.

A third study, conducted one full year after ACTION was deployed. *ACTION Deployment, One Year Later* (Gifford 2011) examined the net impact of displacement/diffusion in the three main areas that ACTION was deployed – Downtown, Melvin Avenue and Concession Street.

Today, the ACTION anti-violence strategy has been deployed and operational over three years. This is the fourth in the series of studies that examine the areas more prone to violence within the City of Hamilton.

III. STATEMENT OF THE PROBLEM

In May 2010, the Hamilton Police Service implemented the ACTION Strategy. To support of the deployment of ACTION Teams, areas of concentrated violent events were identified in a study titled *An Overview of Violence-prone Areas in Hamilton* (Gifford 2010). This study essentially replicates the methodology used in the initial analysis with updated data from 2012 for the purpose of evaluating any changes to the identified areas of violence and to support evidence-based deployment of resources.

IV. METHODOLOGY

A.   STUDY APPROACH

The three previous studies relating to the ACTION deployment (Gifford, 2010 & 2011) were reviewed along with the supporting data. Other demographic/statistical studies including *Code Red* (Buist, 2010), *Neighbourhood Development Strategy* (City of Hamilton, 2012), *Profile of Hamilton's Downtown Area* (Mayo, 2012), and *Neighbourhood Profiles* (Mayo, & Bahkt 2012) were reviewed and referenced where appropriate.

B.   STUDY PARAMETERS

The study period for this analysis is one year – 2012.   Uniform Crime Reporting (UCR) statistics were extracted from the NICHE records management system for the years 2009 and 2012. Results were aggregated by Patrol Division using the traditional breakdown and Statistics Canada's definition of Violent Crimes, Property Crimes, Prostitution and Drug Crimes.

In keeping with the methodology of the initial study, both calls-for-service and incident data were used for this analysis.   While incident data represent actual crimes that have been committed, calls-for-service data represent a call for help from the public which may or may not result in a crime. Calls-for-service data offers vital information about the types of events that the public feel are important enough to call 911. Computer Aided Dispatch (CAD) data represents the events that officers see happening on the streets. These data are the actual workload managed by the communications personnel and officers regardless of the disposition of the event.

As a result, calls-for-service data was extracted from the CAD system and violent calls-for-service were identified and grouped into the following three data sets:

Group 1:   Homicide, Shooting, Stabbing, Person with Weapon, Robbery and Sexual Assault

Group 2:   Assault

Group 3:   Priority Zero

The Group 1 dataset – Homicide, Shooting, Stabbing, Person with Weapon, Robbery and Sexual Assault calls-for-service represent potentially some of the most violent types of calls-for-service that occur in Hamilton; Assault calls-for-service included in the Group 2 layer represent one of the more frequent type of violent calls; while the Priority Zero calls are life threatening events.

Robbery Incidents were obtained from the HPS Crime Analysts and Shooting incidents were provided by the HPS Intelligence Analyst. Both of these data sets represent actual crimes that have been committed. The number of Shooting incidents were few and therefore the data was left at the point level. Robbery incidents were included as a layer in the hot spot analysis because of the nature of the crime. It is a violent crime that involves targets that cross different sectors i.e. commercial, financial, public and residential settings; and therefore, has a greater likelihood of occurring anywhere within the city. It is not a crime that is just localized to the more vulnerable areas of the city or areas that are frequented by large segments of the community.

C.   DATA ANALYSIS

SPSS (Statistical Package for Social Sciences) was used to download and process the CAD data. Canceled and duplicated calls-for-service were removed.

All data were imported into ArcGIS 10.1 (a geographic information system) and Hot Spot Analysis tool in Crime Analyst was used to produce kernel density maps for Violent (Group 1), Assault (Group 2) calls-for-service and Robbery Incident data sets. Similar to the 2009 study, a bandwidth (or search radius) of 1.0 kilometer and grid cell size of 65 meters were used to produce the density maps. The contour tool was used to highlight the areas of high event concentration. Shooting and Priority Zero data sets were left at the point data level. The violence-prone area was identified based on the intersection of these three hot spots. The intent behind this approach is for each separate layer to confirm or refute the location of the other layers.

A second method of cluster analysis was applied to the data to confirm identified patterns. The Getis-Ord Gi* (pronounced G-I-star) statistical method was used to identify hot spots using statistical significance testing. The data was aggregated to a distance of 65 meters with a fixed distance band of 2,000 meters.

Hot spots within the violence-prone area were identified using a search radius of 300 meters and cell size of 30 meters. As well, fundamental temporal statistics were calculated for the data within the violence-prone area.

D. DATA LIMITATIONS

The Shooting incident data and the Priority Zero calls-for-service data were small data sets, so they were kept at the point level. This resulted in a higher degree of observatory analysis versus confirmatory analysis on the part of the author for these data sets.

Due to the geography of Hamilton which is a combination of large rural areas in Division 3 and to some extent in Division 2 and concentrated urban areas in Divisions 1 and 2, the demands for policing differ across the City. As a result, it is difficult to keep the scale of the analysis consistent across the study area.

Variation in incident patterns was not taken into account in this study. For example, activity level in areas around the Colleges and Universities may spike for a period of time and require focused attention. This would also apply to seasonal variation such as the activity level at large sports parks such as Mohawk Sports Park on the Mountain. During the warmer weather, more people use the facilities which could mean an increase in incidents at these locations.

Lastly, this study is not a full-scale evaluation of the ACTION strategy. Results from other studies such as the Workload Study, ACTION Annual Report, 7-Year Staffing Plan, Chief's Budget Presentation etc. should be taken into consideration when assessing the overall impact of the ACTION Strategy.

V. RESULTS AND FINDINGS

A. VIOLENT PROPERTY & OTHER CRIMES COMPARISON

To obtain a general understanding of where the more violent crimes are occurring in the City, Uniform Crime Reporting (UCR) data were extracted from our Records Management System for 2009 & 2012. The results are shown in **Table 1**.

Table 1: Violent, Property, Prostitution & Drug Crimes by Division–2009 & 2012

CRIMES BY PATROL DIVISION – 2009 & 2012										
	DIV. 1	% of Total	DIV. 2	% of Total	DIV. 3	% of Total	U/K*	% of Total	SERVICE TOTAL	2009-2012 %Change
VIOLENT CRIME – 2009	2,693	39.4	2,018	29.5	2,026	29.7	96	1.4	6,833	
VIOLENT CRIME – 2012	2,084	37.7	1,782	32.2	1,575	28.5	88	1.6	5,529	-19.1
PROPERTY CRIME – 2009	6,348	29.5	6,733	31.2	8,116	37.7	350	1.6	21,547	
PROPERTY CRIME – 2012	5,736	30.9	5,655	30.5	6,842	36.9	334	1.8	18,567	-13.8
PROSTITUTION – 2009	84	77.8	22	20.4	1	0.9	1	0.9	108	
PROSTITUTION -2012	59	96.7	2	3.3	0	0.0	0	0.0	61	-43.5
DRUG CRIME – 2009	485	42.0	294	25.5	366	31.7	10	0.9	1,155	
DRUG CRIME – 2012	850	52.8	412	25.6	323	20.1	25	1.6	1,610	39.4

Source: NICHE UCR Occurrence Statistics printed on 2013/03/11
* Note: U/K denotes the crimes that could not be assigned to a Division

In 2012, 37.7% of the violent crimes that occurred in the City of Hamilton were in Division 1. This compares to 32.2% in Division 2 and 28.5% in Division 3. This same pattern showing a higher percentage of violent crime occurring in Division 1 is also evident in the 2009 data with 39.4% in Division 1, 29.5% in Division 2 and 29.7% in Division 3.

In contrast, the opposite is observed with property crimes. In 2012, 36.9% of the property crimes that occurred in the City of Hamilton were in Division 3. This

compares to 30.9% in Division 1 and 30.5% in Division 2. This same pattern showing a higher percentage of property crime occurring in Division 3 is also evident in the 2009 data with 37.7% in Division 3, 31.2% in Division 2 and 29.5% in Division 1.

As well, Division 1 has the highest percentage of prostitution in 2012 (96.7%) and 2009 (77.8%); and Drug Crimes in 2012 (52.8%) and 2009 (42.0%).

And, over the past three years, violent (-19.1%), property (-13.8%) and prostitution crime (-43.5%) statistics show double digit decreases. Only drug crimes increased (39.4%) between 2009 and 2012 and this is most likely due to the enforcement nature of this crime.

B   SOCIAL LANDSCAPE

Social and demographic trends provide a context through which the lives of individuals and groups can be better understood. Such data has been collected, analyzed and made relatively accessible to the general public. One notable study is the Code Red series (Buist, 2010) sponsored by the Hamilton Spectator in 2010. This series compared and ranked specific economic and public health indicators across neighbourhoods in the City of Hamilton. The results of the overall ranking of neighbourhoods are shown in **Figure 1**. Here, many of the neighbourhoods with the lowest rankings are located below the escarpment and extend across central Hamilton and east Hamilton. Many of these neighbourhoods are also within the violence-prone areas identified in subsequent analyses further along in this report.

Figure 1: Code Red Overall Ranking
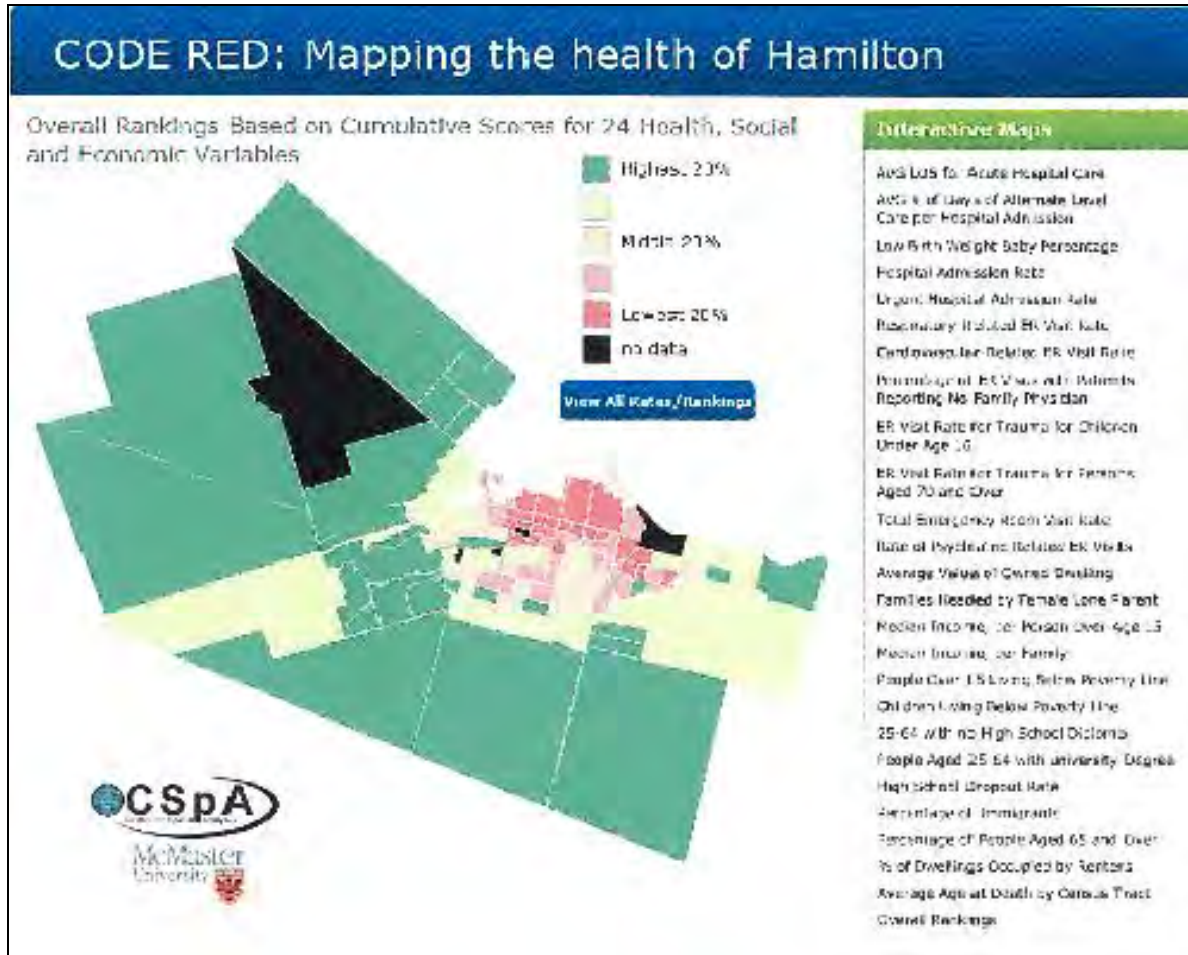
In response to the results of the Code Red series, the City of Hamilton identified twelve priority neighbourhoods and collaborated with groups and agencies to develop action strategies to improve the quality of life in these areas as part of the Neighbourhood Development strategy (City of Hamilton, 2012). A map showing the location of Hamilton's Neighbourhood Action Strategy Boundaries is shown in **Figure 2**. Similarly, eight of these priority neighbourhoods are within the violence-prone areas identified in the next section.

Figure 2: Hamilton's Neighbourhood Action Strategy Boundaries

C. HOT SPOT ANALYSIS

Spatial statistics help to reveal patterns and illustrate distributions in data that would be difficult to see with the naked eye (ESRI, 2011). Hot Spot analysis using spatial statistics produces maps that show, geographically, where events are concentrated.

Two methods of hot spot analysis were used in this study – Kernel Density, a method that maps density values of points and Getis-Ord Gi* (pronounced G-I-star), a method that maps the statistical significance of points.

1.   Kernel Density

Kernel Density analysis is a spatial statistical method that generates a map of density values from an underlying point layer (ESRI UK, 2012). Simply put, a grid is overlaid all the points. The number of points in each cell within a specified search radius are counted resulting in an overall density value for each cell.

The results of the kernel density hot spot analyses using the 2012 data are shown in **Figures 4, 6** and **8.** For comparison purposes, the results of the same analyses conducted using 2009 data are shown in **Figures 3, 5** and **7.** It is important to note that the same parameters were used for both analysis.

Referring to **Figures 3** and **4**, the large hot spot of Violent calls-for-service (red symbology) below the escarpment visually appears smaller in 2012 when compared to the results from 2009. As well, the intensity of the hot spots located on the mountain area appear to have diminished in 2012 when compared to the results found in 2009. This is shown by the change in colour of the features from red to yellow. And, both the size and intensity (red to yellow symbology) of the smaller hot spots located in west and east Hamilton and Stoney Creek have decreased between the 3-year period.

Similar observations are also apparent between hot spots that were calculated for the Assault calls-for-service in 2009 and 2012 (**Figures 5** and **6**) and for the Robbery incidents (**Figures 7** and **8**). That is, the size of the core hot spot below the escarpment is noticeably reduced and the peripheral features on the mountain, west Hamilton, east Hamilton and Stoney Creek appear both smaller and less concentrated (change in colour from red to yellow).

Figure 3: Hot Spot Analysis for Violent Calls-for-Service – 2009
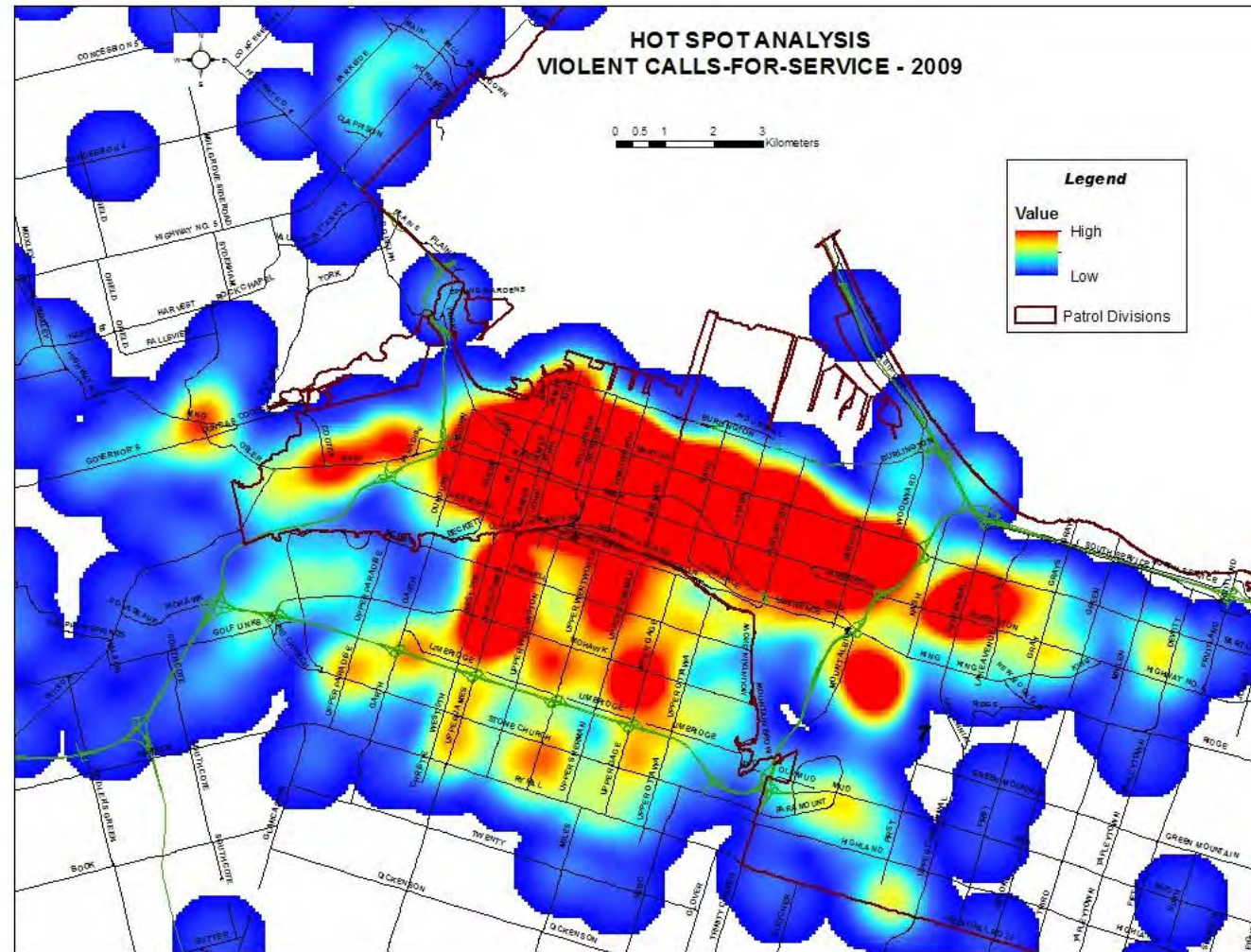
Figure 4: Hot Spot Analysis for Violent Calls-for-Service – 2012
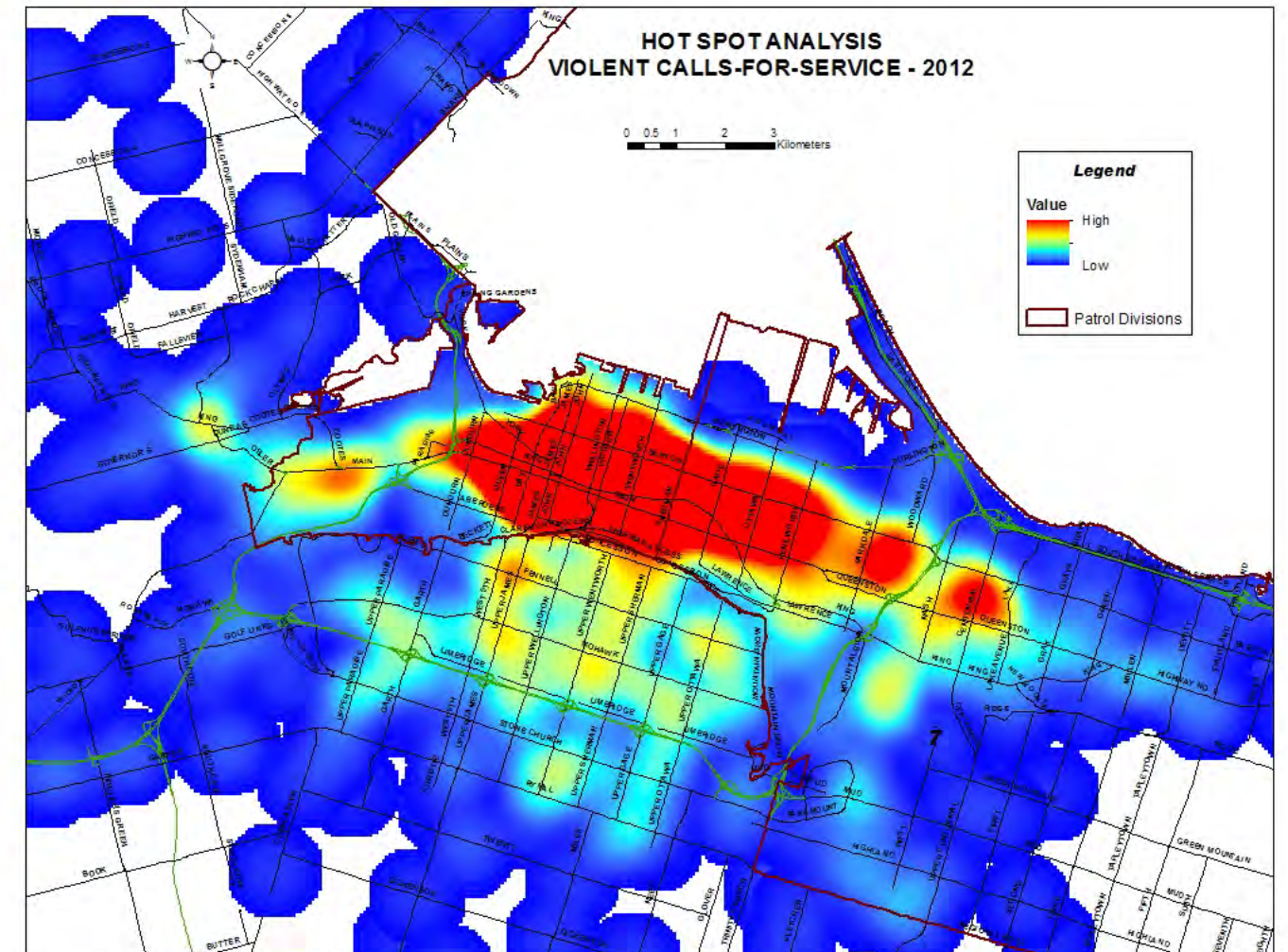
Figure 5: Hot Spot Analysis for Assault Calls-for-Service – 2009

HOT SPOT ANALYSIS
ASSAULT CALLS-FOR-SERVICE - 2009
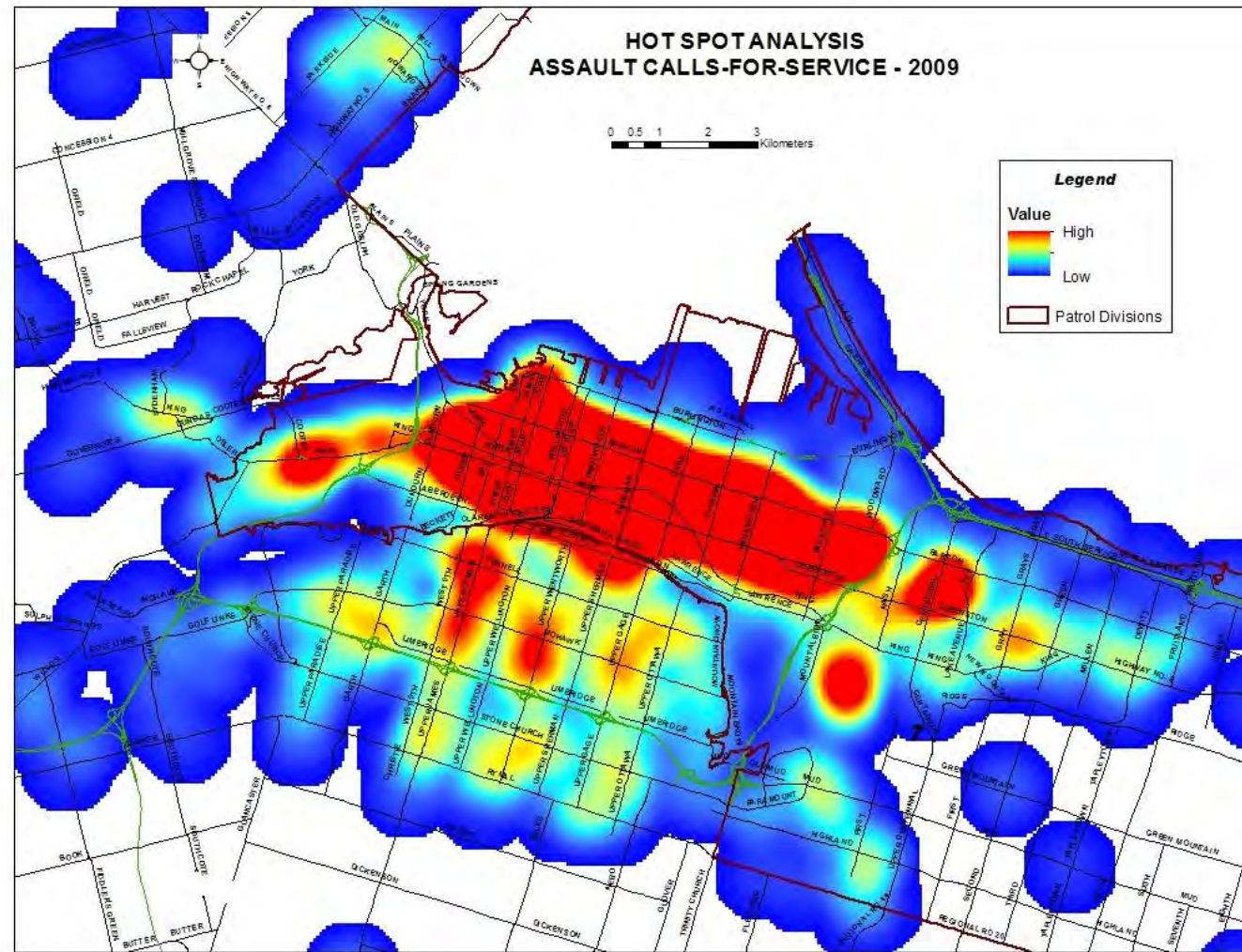
Figure 6: Hot Spot Analysis for Assault Calls-for-Service – 2012

HOT SPOT ANALYSIS
ASSAULT CALLS-FOR-SERVICE - 2012
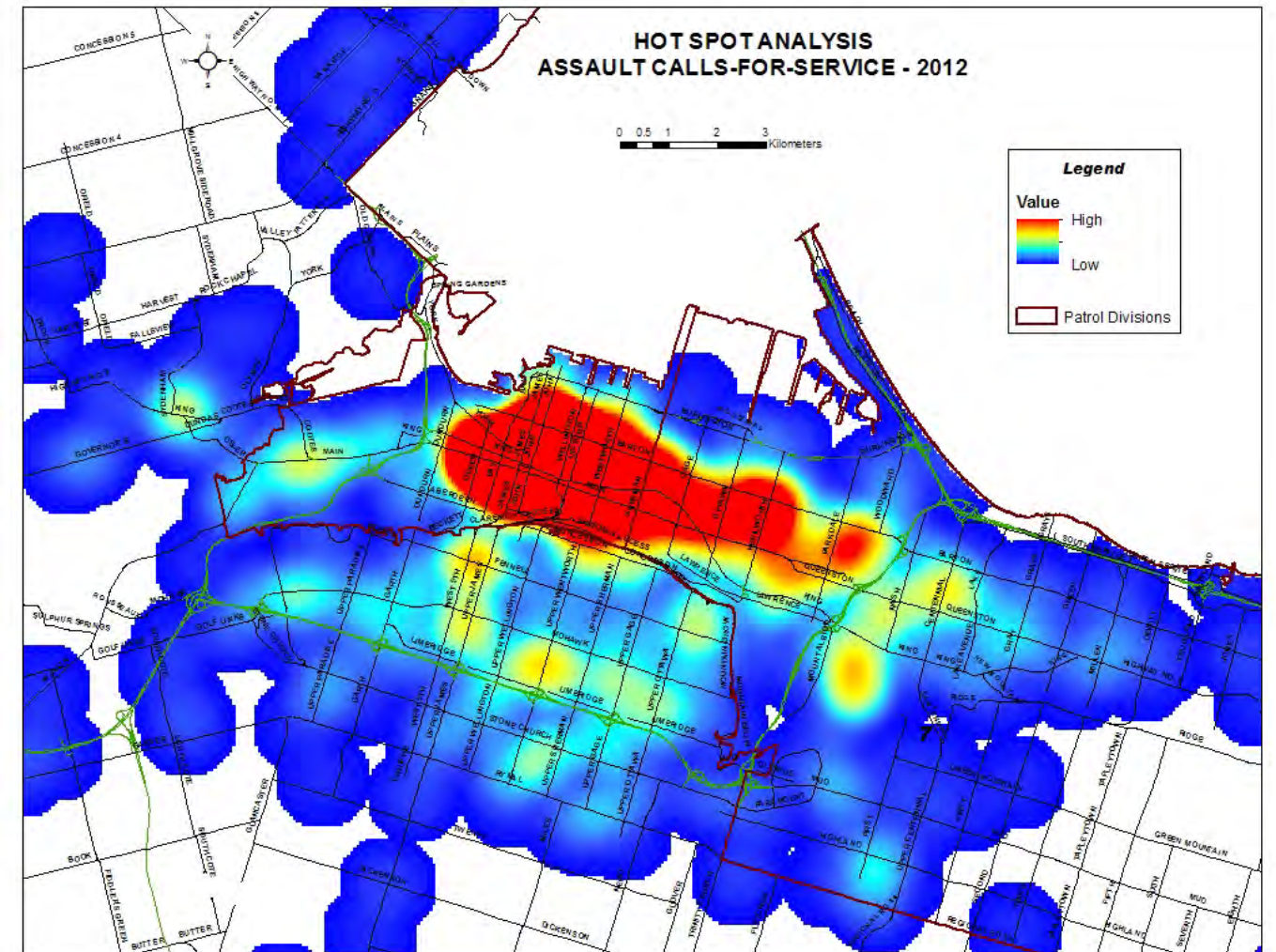
Figure 7: Hot Spot Analysis for Robbery Incidents – 2009
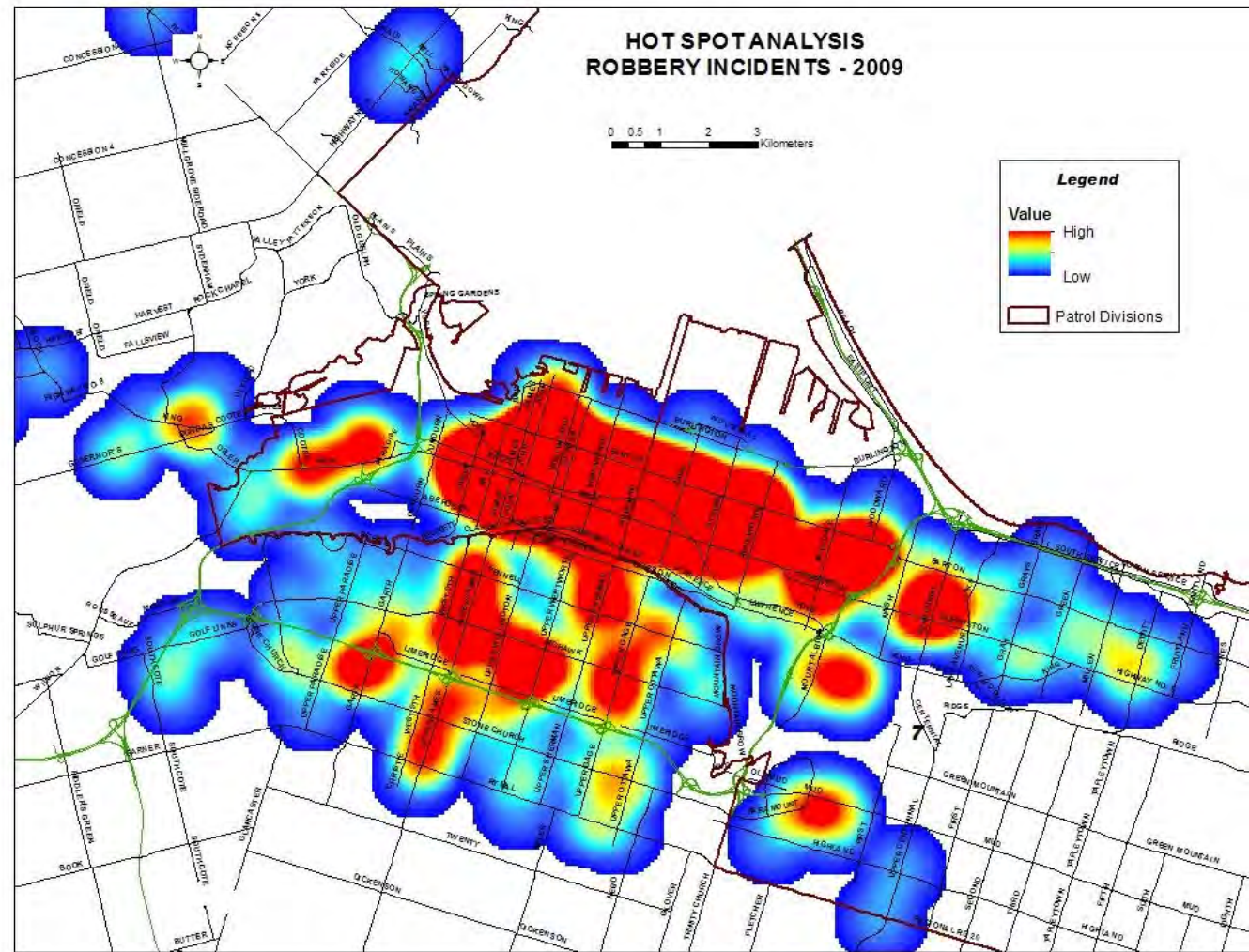
Figure 8: Hot Spot Analysis for Robbery Incidents – 2012

HOT SPOT ANALYSIS
ROBBERY INCIDENTS - 2009

0 0.5 1   2   3
Kilometers

Legend

Value
High
Low

Patrol Divisions

HOT SPOT ANALYSIS
ROBBERY INCIDENTS - 2012

0 0.5 1   2   3
Kilometers

Legend

Value
High
Low

Patrol Divisions
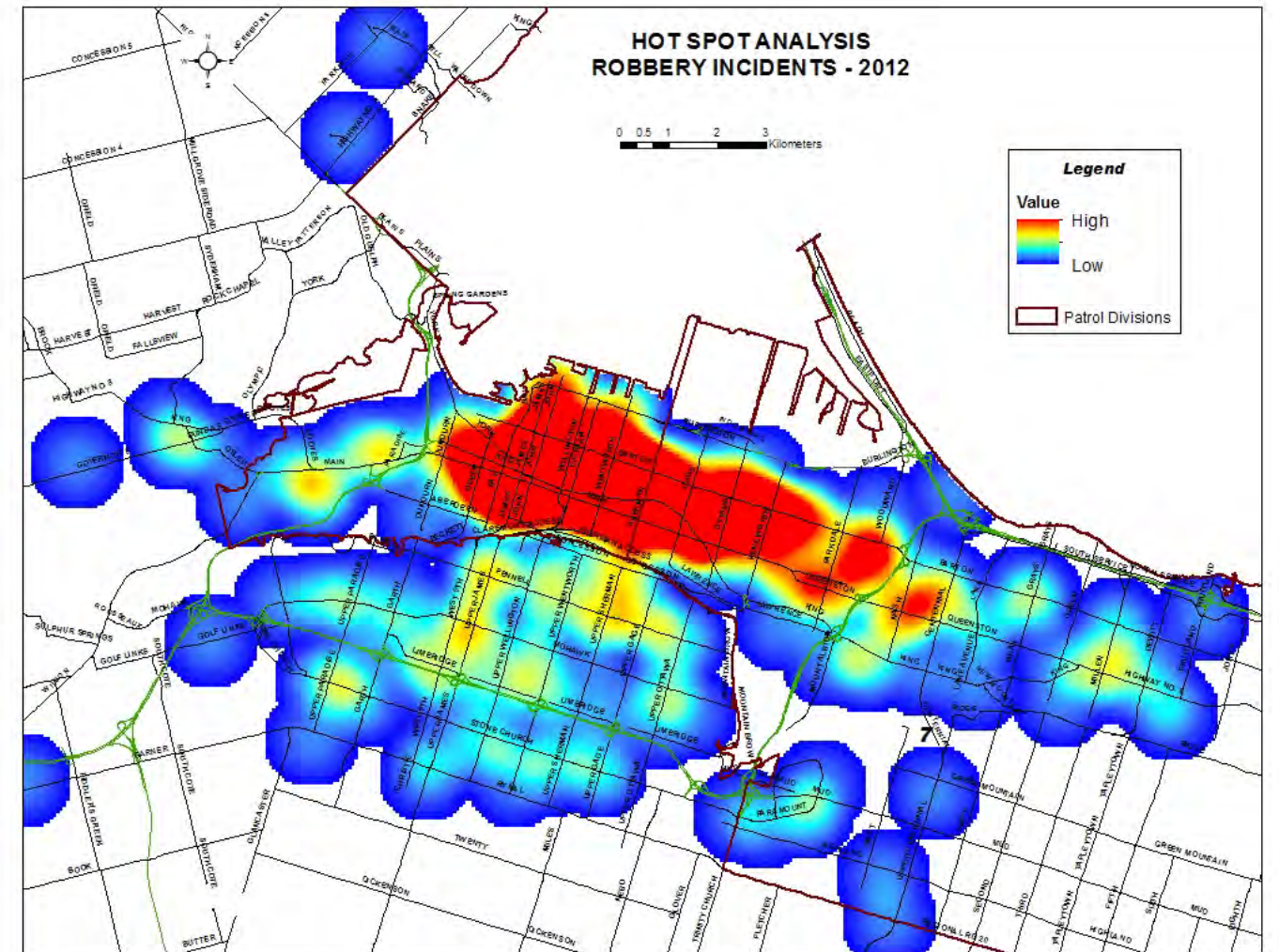
As outlined in the methodology, all three layers were overlaid and the intersection of the areas with the most intense clustering of events (red symbology) was delineated to create a core area that represents the violence-prone area.

Figure 9 presents the violence-prone areas identified in 2009 (beige feature) overlaid with the results using the 2012 data (blue feature). This view of the data presents a summary of the results of the hot spot analysis discussed in the previous section. Here, the size of the core area is visually reduced in 2012 and there are no peripheral areas on the mountain or in west or east Hamilton.

Figure 9: Violence-Prone Areas – 2009 and 2012
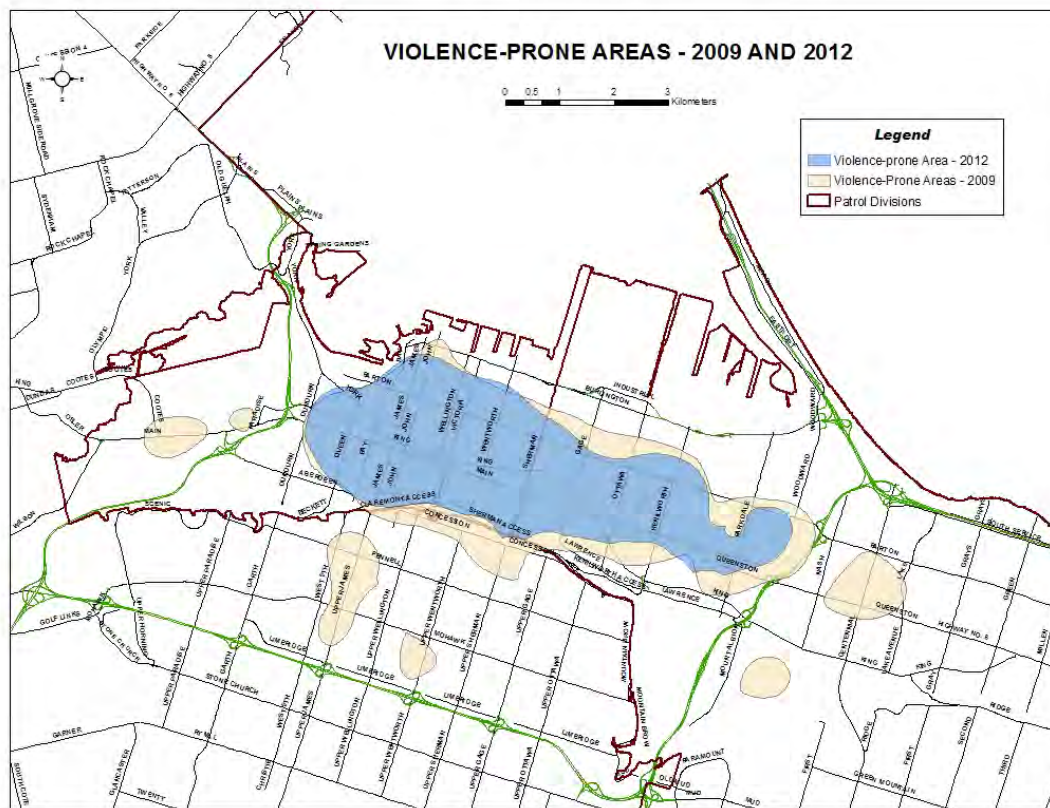
2.   Getis-Ord Gi*

To further confirm the location of the most intense clustering of events, a second method of hot spot analysis or cluster analysis was applied to the 2012 data.

The Getis-Ord Gi* statistical method determines whether clusters in the data are statistically significant. To be a statistically significant hot spot, a feature must have a high Gi* value and be surrounded by other features with high Gi* values as well.

The results of the analysis are shown in **Figures 10, 11** and **12**. Here, hot spots shown in red are statistically significant high clusters of events; random events are shown in yellow and cold spots shown in blue are statistically significant low clusters of events. All three maps, illustrate that the most intense clustering of events are mostly below the escarpment and, for the most part, in central Hamilton and stretching into east Hamilton.

Figure 10: Hot Spot Results for Violent Calls-for-Service – 2012
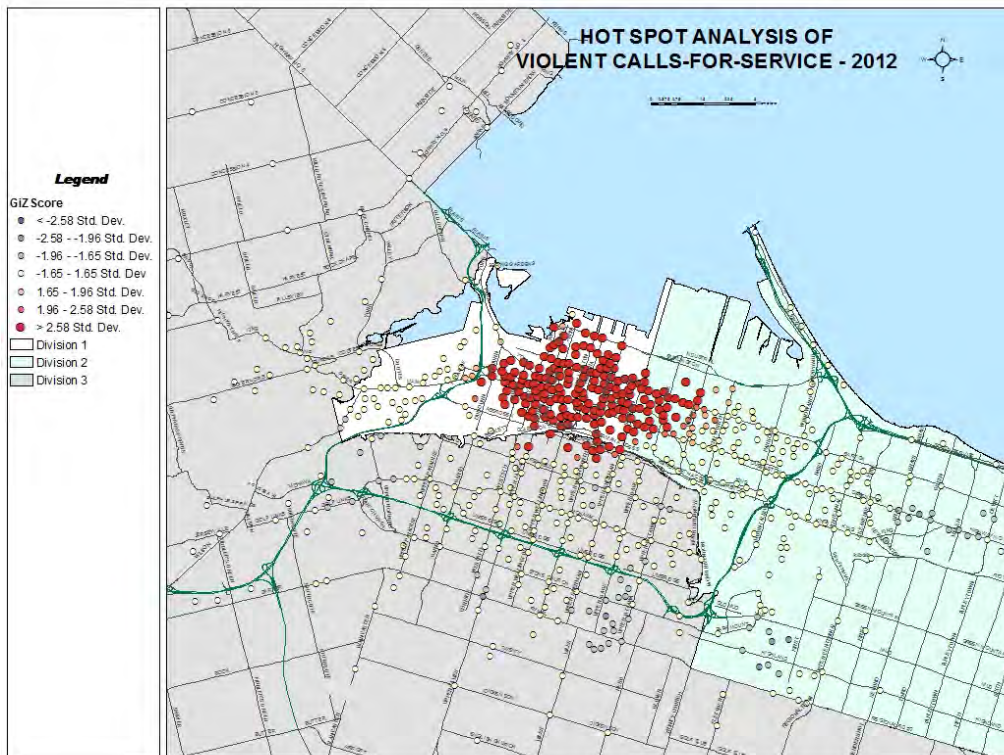
Figure 11: Hot Spot Results for Assault Calls-for-Service – 2012
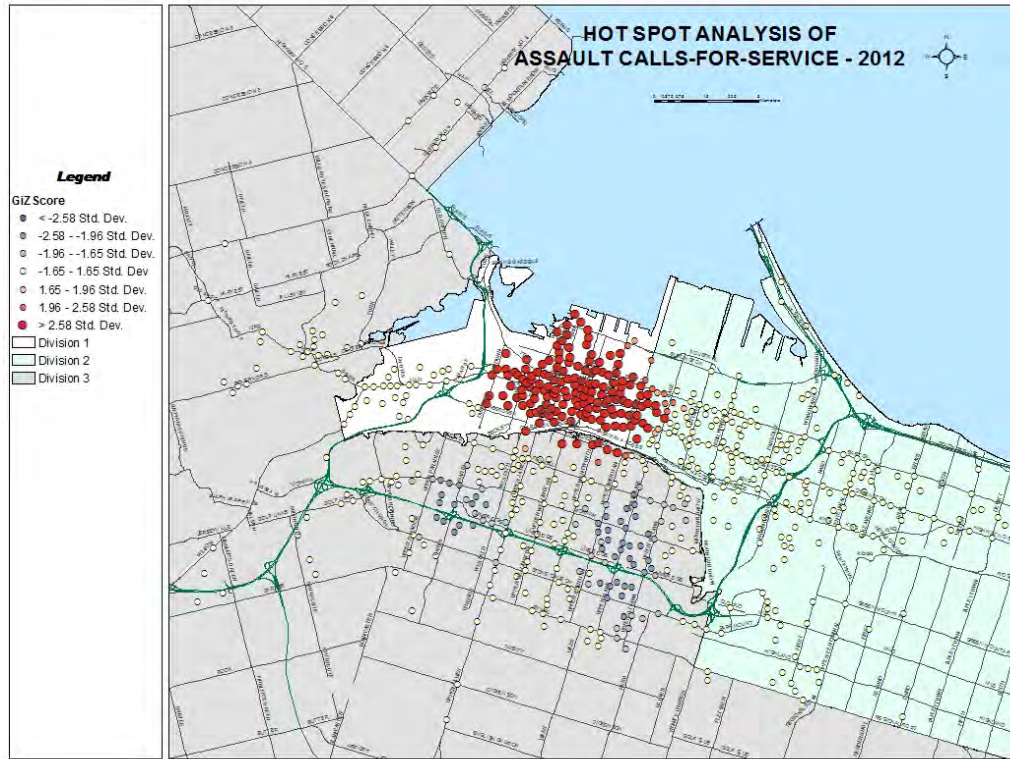
Figure 12: Hot Spot Results for Robbery Incidents – 2012
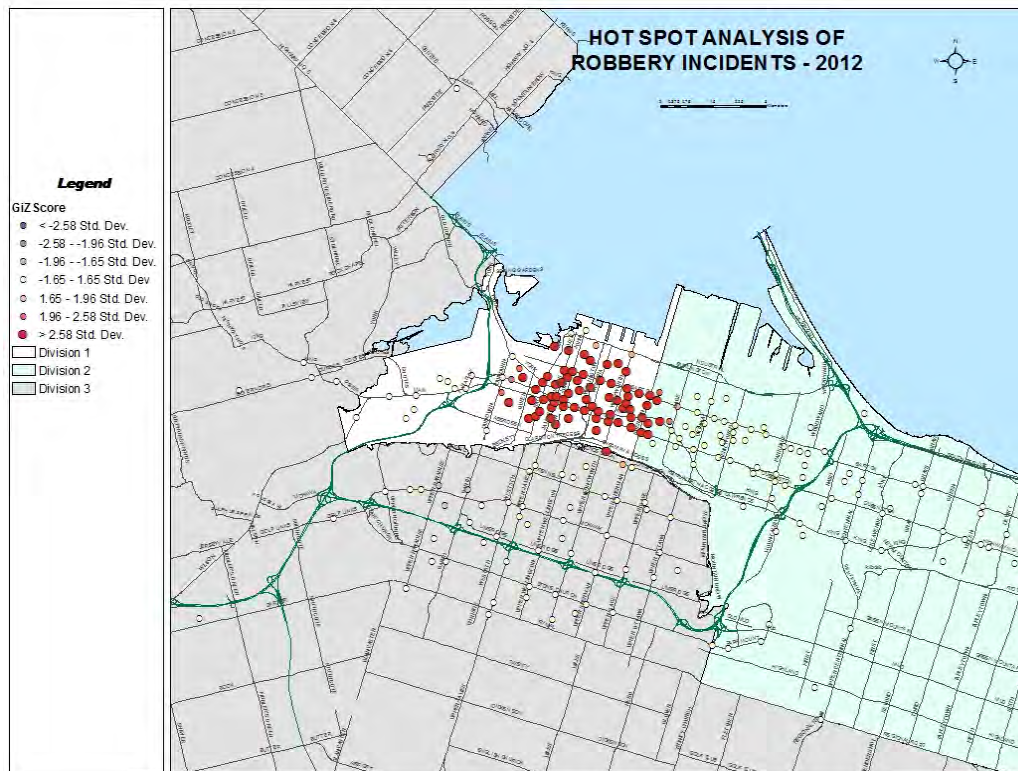
D.   VIOLENCE-PRONE AREAS

The violence-prone areas calculated initially and again in this study were compared in terms of size, frequency and density of events.

1.   Size

As shown in **Table 2**, the size of the core hot spot calculated using 2012 data is 16.8 sq km and consumes 1.5% of the area of the City of Hamilton.   When compared to the size of the core hot spot calculated in 2009, the area has decreased by 36.4% and consumes a smaller portion (0.9% less) of the city.

Table 2: Violence-Prone Areas (VPA) Comparison, 2009 & 2012

2009		2012		% CHANGE VPA	% CHANGE CITY
VPA	% CITY	VPA	CITY		
26.4 sq km	2.3%	16.8 sq km	1.5%	-36.4%	-0.9%

*City of Hamilton area = 1,126 sq km

2.   Frequency and Density

Calculating the density or the number of events per area, is a more accurate method of comparing two areas of a different size.   Using the areas shown in **Table 2** above, **Table 3 and 4** present the number of crimes and calls-for-service and the density of events in the violence-prone areas identified using the 2009 and 2012 data and within the City of Hamilton.   **Figures 13 and 14** present the density calculations graphically.

Referring to **Tables 3** and **4**, there are fewer events occurring in both the violence-prone area and within the City of Hamilton in 2012 when compared to 2009, with the exception of Shooting incidents.   However, when the density or number of events per square kilometer is calculated and compared, this reveals another dimension to the findings.

Table 3: Frequency and Density of Events in Violence-Prone Areas (VPA) – 2009

| CRIMES & CALLS-FOR-SERVICE (CFS) | 2009 | | | |
| | VPA | | CITY | |
	FREQ.	DENSITY	FREQ.	DENSITY
Violent CFS	1,176	44.5	1,863	1.7
Assault CFS	1,764	66.8	2,540	2.3
Robbery Incidents	445	16.9	619	0.5
Priority Zero CFS	102	3.9	163	0.1
Shooting Incidents	7	0.3	9	0.01

Table 4: Frequency and Density of Events in Violence-Prone Areas (VPA) – 2012

| CRIMES & CALLS-FOR-SERVICE (CFS) | 2012 | | | |
| | VPA | | CITY | |
	FREQ.	DENSITY	FREQ.	DENSITY
Violent CFS	840	50.0	1,610	1.4
Assault CFS	1,277	76.0	2,136	1.9
Robbery Incidents	243	14.5	405	0.4
Priority Zero CFS	49	2.9	104	0.1
Shooting Incidents	6	0.4	9	0.01

Referring to **Figure 13**, there are fewer events per square kilometer within the City of Hamilton in 2012 for Violent calls-for-service, Assault calls-for-service and Robbery incidents and no change for Priority Zero calls-for-service and Shooting incidents when compared to 2009.

A similar comparison of the density of events within the violence-prone areas (see **Figure 14**) reveals an increase in the number of Violent calls-for service, Assault calls-for-service and Shooting incidents and a decrease for Priority Zero calls-for-service and Robbery incidents per square kilometer.

In other words, although the of events per sq/km city-wide have decreased or remained stable, the density of events within the violence-prone area in 2012 show more variance.

Figure 13: Density of Events in the City of Hamilton – 2009 and 2012

DENSITY OF EVENTS IN THE CITY OF HAMILTON - 2009 & 2012

	Violent	Assault	Robbery	Priority Zero	Shooting
2009	1.7	2.3	0.5	0.1	0.01
2012	1.4	1.9	0.4	0.1	0.01
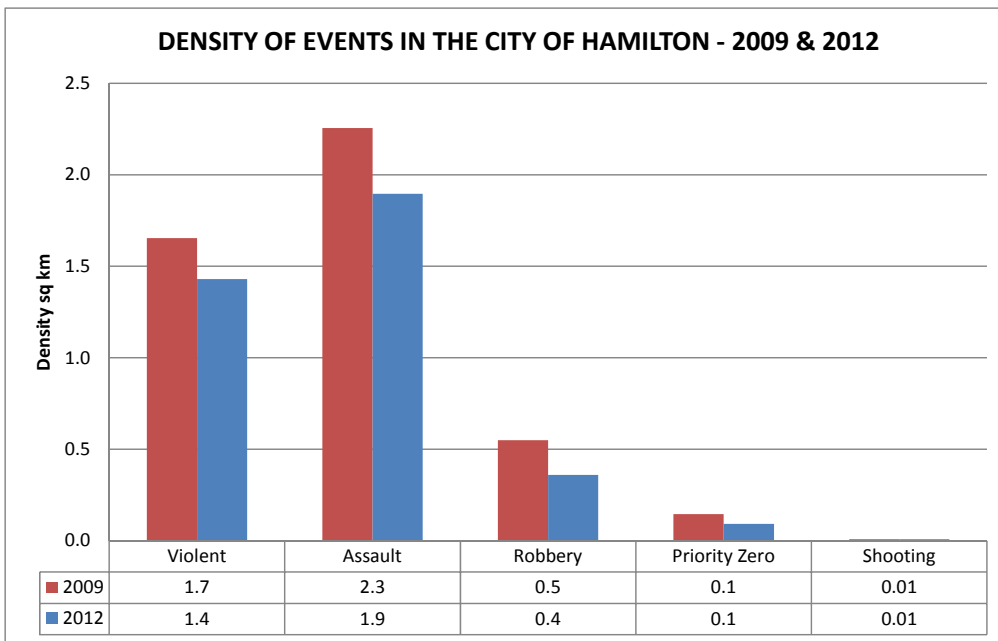
Figure 14: Density of Events in the Violence-Prone Areas – 2009 and 2012

DENSITY OF EVENTS IN THE VPA - 2009 & 2012

	Violent	Assault	Robbery	Priority Zero	Shooting
2009	44.5	66.8	16.9	3.9	0.3
2012	50.0	76.0	14.5	2.9	0.4
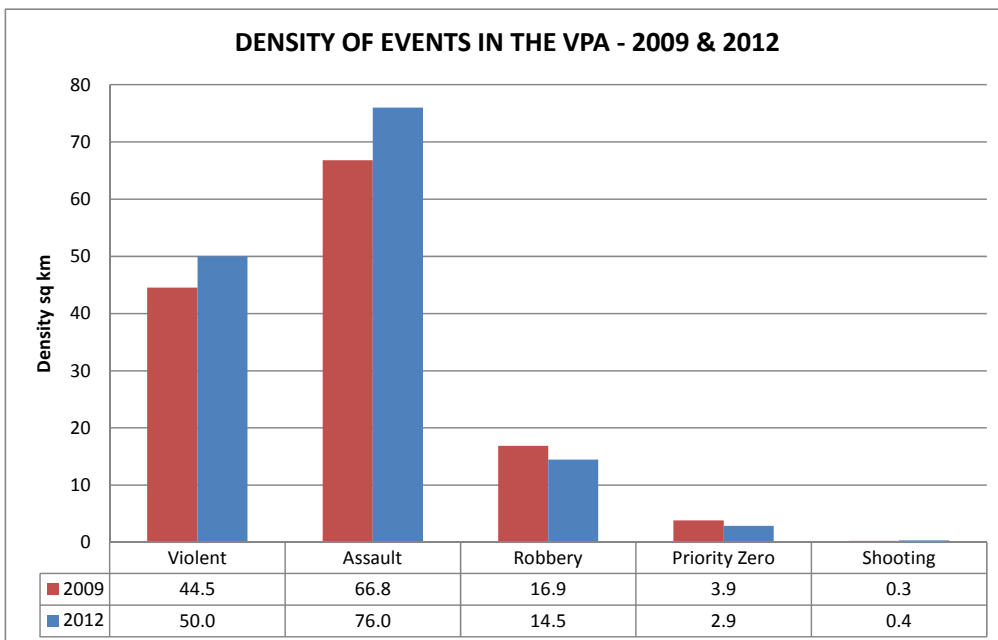
3.   Hot Spots

The Kernel Density hot spot analysis method was applied to the three data sets – Violent calls-for-service, Assault calls-for-service and Robbery incidents, using the events that occurred within the violence-prone area. The results are shown in **Figures 15, 16** and **17**.

Referring to **Figure 15**, again the most intense spatial clustering (red symbology) of the Violent calls-for-service is centered around the Downtown core at King Street / James Street, and; along King Street / Tisdale Street between Victoria Street and just east of Wentworth Street.

Smaller and somewhat less intense hot spots (red to yellow symbology) are visible surrounding the core to the north along James Street / Robert Street; to the West around Hess Street; to the south on either side the James Street. A small hot spot is also located in the Barton Street / Sherman Avenue area.

To a somewhat lesser degree (yellow symbology), Violent calls-for-service are clustered along Barton Street; Wellington Street North, and; between Wentworth Street North and Sherman Avenue. Interestingly, all of these hot spots coincide with the Target Areas previously identified.

Referring to **Figure 16**, although the shape and to some degree the intensity of some of the red hot spots differ, similar geographic patterns are evident with the Assault calls-for-service. Again, intense clustering is shown around the King Street and James Street area. Larger more intense hot spots are evident in the Hess Street area; James Street North / Robert Street; along Barton Street between Catherine Street and Wellington Street, and; along King Street / Tisdale Street

between Wellington Street and Wentworth Street and extending to the south towards the escarpment.

Figure 17, depicts the clustering of Robbery incidents. Again, the most intense clustering of events are located around King Street / James Street; along King Street / Tisdale Street between Victoria Avenue and Wentworth Street, and; along Sanford Avenue between Wilson Street and Barton Street.

Smaller and somewhat less intense hot spots (red to yellow symbology) are visible surrounding the core to the north along James Street / Robert Street; to the West around Hess Street; to the south on either side the James Street.

Similar pockets of clusters are shown in areas just east of Sherman Avenue around Barnesdale Avenue / Barton Street; Barnesdale Avenue / Main Street; Gage Park area, and; the Centre Mall area.

Figure 15: VPA Hot Spot Analysis, Violent Calls-for-Service – 2012

Figure 16: VPA Hot Spot Analysis, Assault Calls-for-Service – 2012

Figure 17: VPA Hot Spot Analysis, Robbery Incidents - 2012
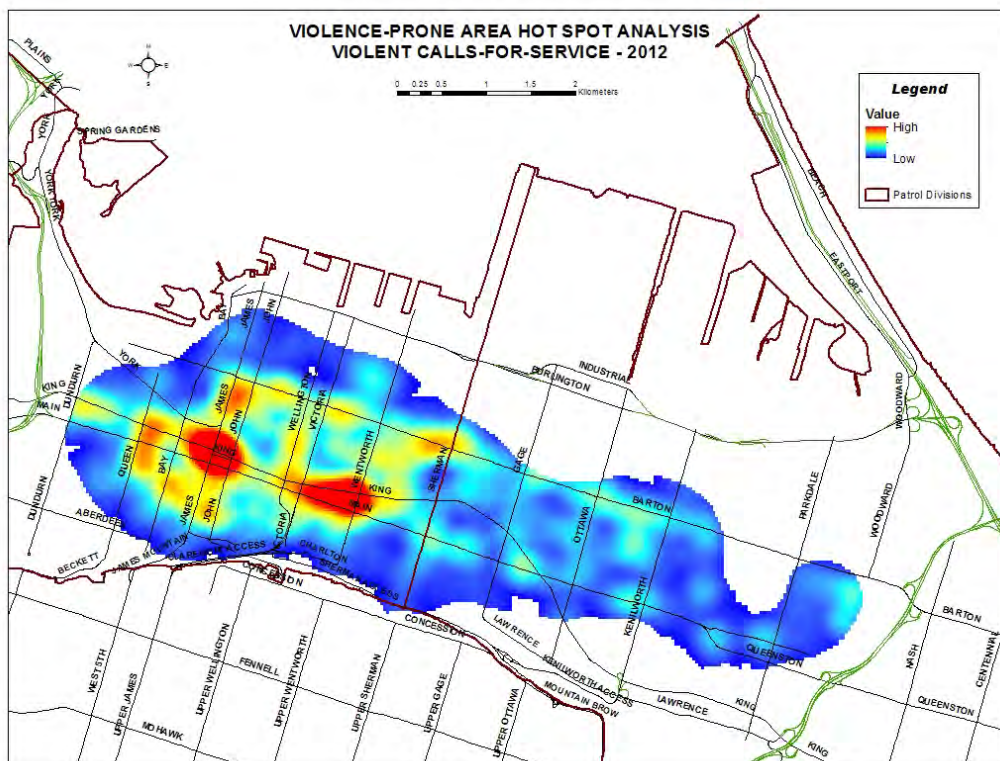
E.   TARGET AREAS

1.   Location

As part of the initial study, target areas within the violence-prone area were identified to help further narrow down the large area into more manageable segments.   Repeat events were overlaid with Shooting and Priority Zero events. Neighbourhood features such as hospitals, parks, low income housing, social services, schools, colleges/universities were also added.   Further, the Crime Managers were consulted to provide more insight into the challenges faced in these neighbourhoods.

Similarly, as part of this study, the Crime Managers were again consulted. Not surprisingly, the target areas identified in the initial study that fall within the updated violence-prone area continue to be areas of concern today.   In fact, the target areas also coincide with many of the areas identified in the hot spot analysis discussed in the previous section.   It is apparent that within these target areas are establishments or attributes that attract people such as parks and malls, entertainment establishments etc. which in turn contributes to the demand for police attention.

Subsequently, 10 areas of focus remain.   **Figure 18** shows the locations of the 10 target areas overlaid the updated violence-prone area.

Figure 18: Violence-Prone Area and Target Areas – 2012
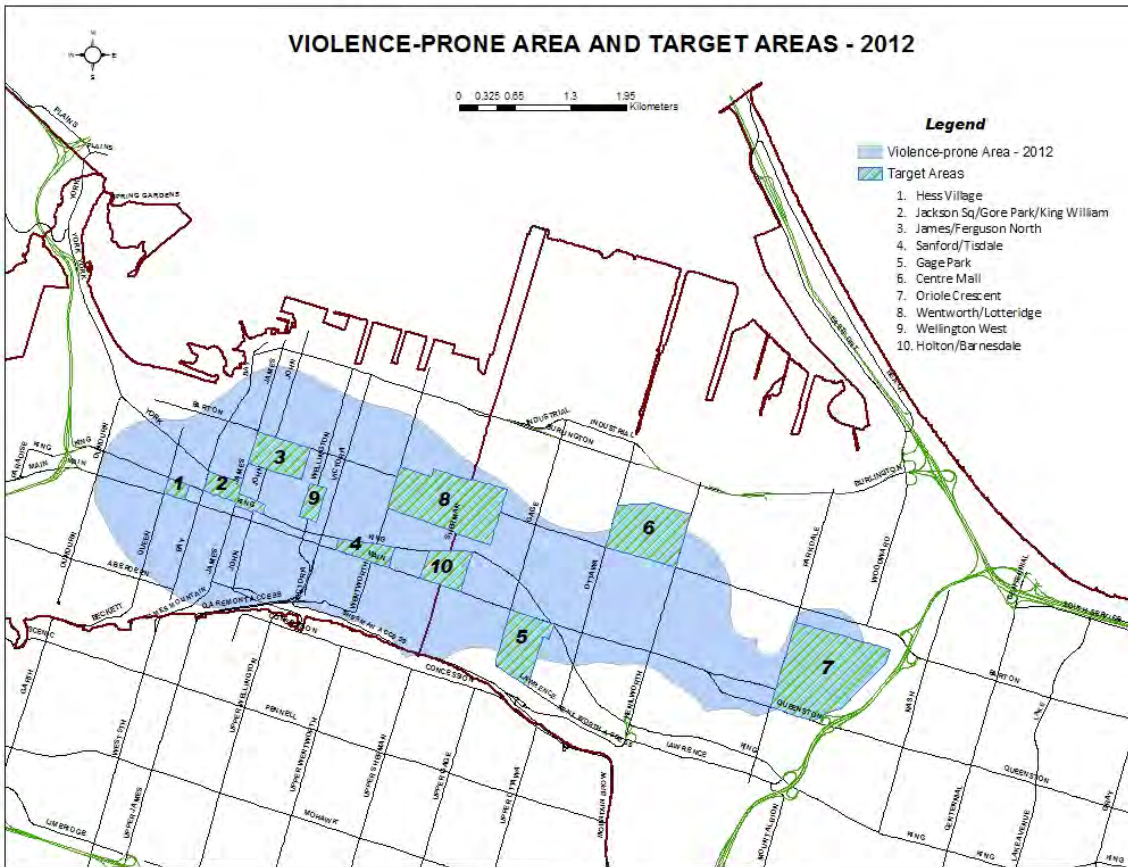
2. Frequency and Density

The number of Violent, Assault and Priority Zero calls-for-service as well as Robbery and Shooting incidents were tabulated for each target area in 2012. Since the size and location of the target areas were kept constant, the number of events that occurred in these areas in 2009 can be compared to the 2012 numbers. **Figures 19, 20** and **21** present this comparison graphically for Violent calls-for-service, Assault calls and Robbery incidents. The Shooting incidents and Priority Zero calls-for-service were not graphed due to the small number of events in the target areas. **Tables 5 through 10** tabulate the size of each Target area along with the frequency and density of events in 2009 and 2012.

Interestingly, there has been a decrease in the number of events occurring in the target areas in 2012 for virtually all of the event types when compared to the 2009 numbers. The exceptions are noted in Hess Village, Wentworth / Lottridge and Wellington / West target areas where the number of Violent calls-for-service are slightly higher in 2012 when compared to 2009 (See **Table 5** and **Figure 19**); Priority Zero calls-for-service in the Centre Mall and Oriole Crescent areas (see **Table 8**), and; Shooting incidents increased in Hess Village, Wentworth / Lottridge and Wellington / West target areas (see **Table 9**) in 2012 when compared to 2009.

Table 5: Frequency & Density of Violent Calls for Service in Target Areas, 2009 & 2102

VIOLENT CALLS-FOR-SERVICE								
ID	TARGET AREA	DIV	2009 FREQ	2012 FREQ	% CHANGE	AREA (Sq Km)	2009 DENSITY	2012 DENSITY
1	Hess Village	1	11	15	36.4%	0.048	227.8	310.7
2	Jackson Sq /Gore Park/ King William	1	85	67	-21.2%	0.144	591.9	466.6
3	James /Ferguson North	1	72	47	-34.7%	0.251	287.3	187.5
4	Sanford /Tisdale	1	76	59	-22.4%	0.128	593.5	460.8
5	Gage Park	2	19	11	-42.1%	0.338	56.2	32.5
6	Centre Mall	2	22	23	4.5%	0.521	42.2	44.1
7	Oriole Crescent	2	48	35	-27.1%	0.970	49.5	36.1
8	Wentworth /Lottridge	1 & 2	66	71	7.6%	0.767	86.1	92.6
9	Wellington /West	1	17	19	11.8%	0.083	205.2	229.3
10	Holton /Barnesdale	1 & 2	47	17	-63.8%	0.206	228.6	82.7

Figure 19: Frequency of Violent Calls-for-Service in Target Areas, 2009 & 2102

FREQUENCY OF VIOLENT CALLS-FOR-SERVICE
IN TARGET AREAS - 2009 & 2012

	Hess Village	Jackson Sq /Gore Park/ King William	James /Ferguson North	Sanford /Tisdale	Gage Park	Centre Mall	Oriole Crescent	Wentworth /Lottridge	Wellington /West	Holton /Barnesdale
2012	15	67	47	59	11	23	35	71	19	17
2009	11	85	72	76	19	22	48	66	17	47
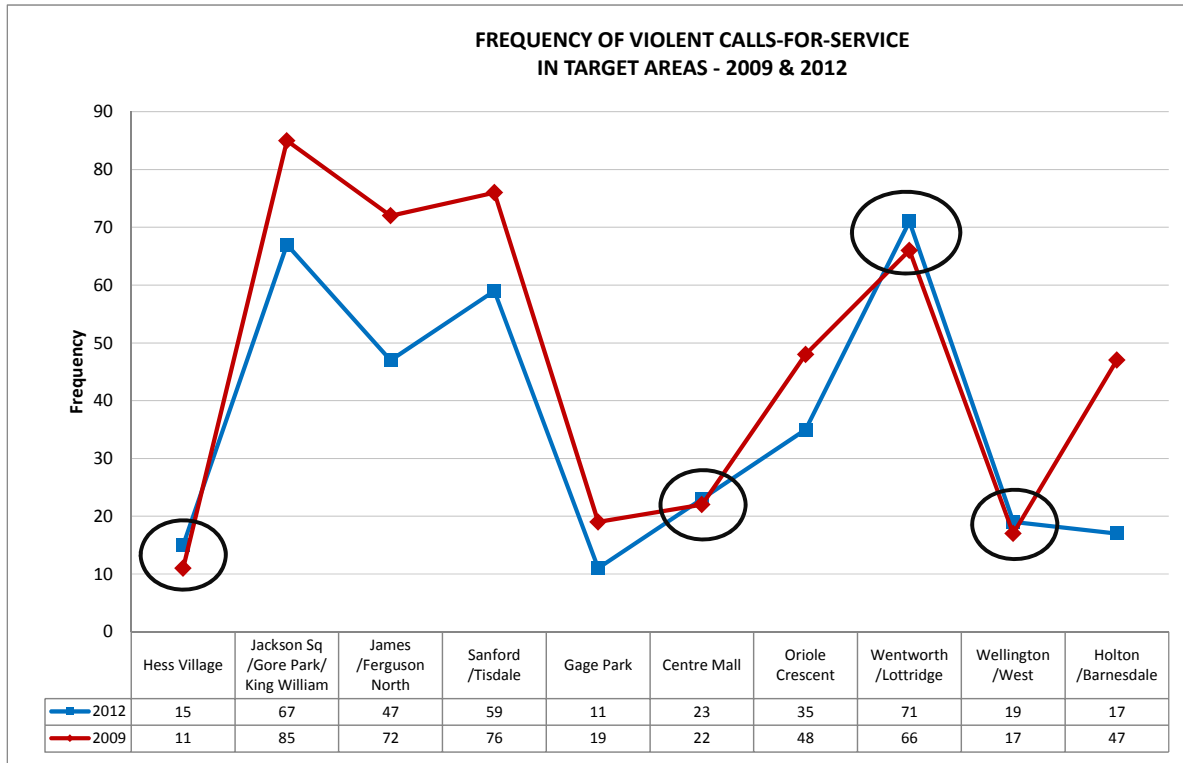
Table 6: Frequency & Density of Assault Calls-for-Service in Target Areas, 2009 & 2012

ASSAULT CALLS-FOR-SERVICE								
ID	TARGET AREA	DIV	2009 FREQ	2012 FREQ	% CHANGE	AREA (Sq Km)	2009 DENSITY	2012 DENSITY
1	Hess Village	1	57	55	-3.5%	0.048	1,180.5	1139.1
2	Jackson Sq/Gore Park/ King William	1	133	96	-27.8%	0.144	926.1	668.5
3	James /Ferguson North	1	158	137	-13.3%	0.251	630.4	546.6
4	Sanford /Tisdale	1	75	56	-25.3%	0.128	585.7	437.3
5	Gage Park	2	17	10	-41.2%	0.338	50.2	29.6
6	Centre Mall	2	28	27	-3.6%	0.521	53.7	51.8
7	Oriole Crescent	2	67	46	-31.3%	0.970	69.1	47.4
8	Wentworth /Lottridge	1 & 2	99	71	-28.3%	0.767	129.1	92.6
9	Wellington /West	1	28	20	-28.6%	0.083	338.0	241.4
10	Holton /Barnesdale	1 & 2	57	34	-40.4%	0.206	277.3	165.4

AN OVERVIEW OF VIOLENCE-PRONE AREAS IN HAMILTON – THREE YEARS LATER

Figure 20: Frequency of Assault Calls-for-Service in Target Areas, 2009 & 2102

FREQUENCY OF ASSAULT CALLS-FOR-SERVICE
IN TARGET AREAS - 2009 & 2012

	Hess Village	Jackson Sq/Gore Park/ King William	James /Ferguson North	Sanford /Tisdale	Gage Park	Centre Mall	Oriole Crescent	Wentworth /Lottridge	Wellington /West	Holton /Barnesdale
2012	55	96	137	56	10	27	46	71	20	34
2009	57	133	158	75	17	28	67	99	28	57
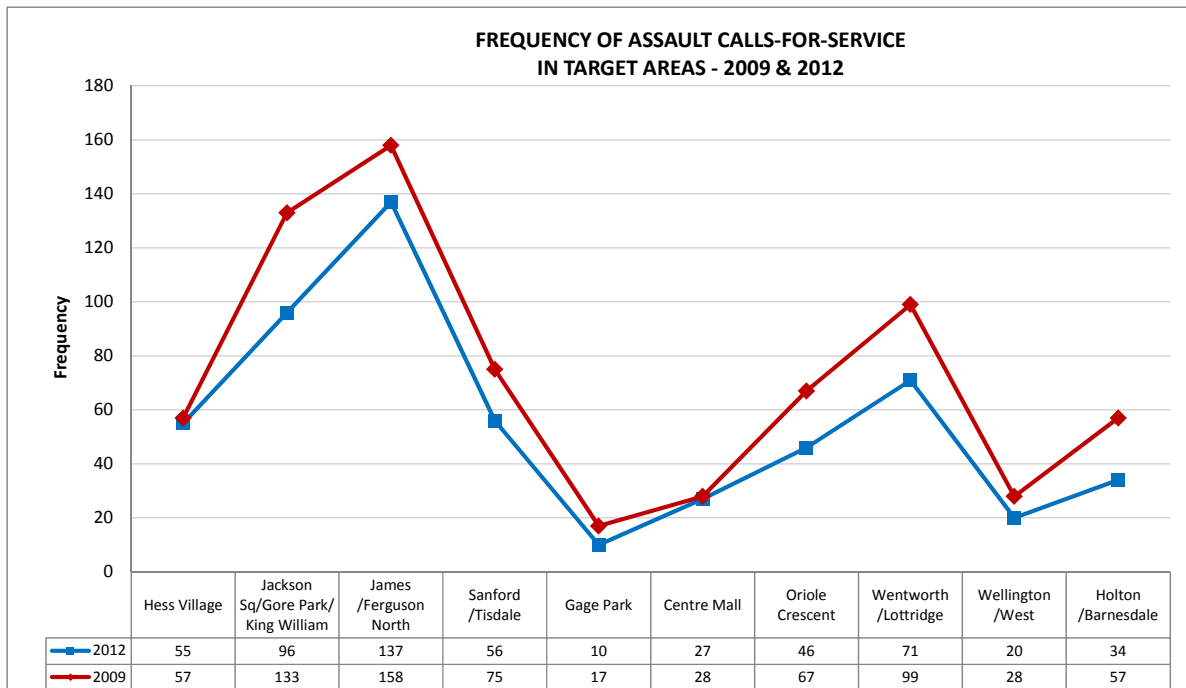
Table 7: Frequency & Density Robbery Incidents in Target Areas, 2009 & 2012

ROBBERY INCIDENTS								
ID	TARGET AREA	DIV	2009 FREQ	2012 FREQ	% CHANGE	AREA (Sq Km)	2009 DENSITY	2012 DENSITY
1	Hess Village	1	4	3	-25.0%	0.048	82.8	62.1
2	Jackson Sq /Gore Park / King William	1	31	19	-38.7%	0.144	215.9	132.3
3	James / Ferguson North	1	29	14	-51.7%	0.251	115.7	55.9
4	Sanford / Tisdale	1	32	20	-37.5%	0.128	249.9	156.2
5	Gage Park	2	7	4	-42.9%	0.338	20.7	11.8
6	Centre Mall	2	11	11	0.0%	0.521	21.1	21.1
7	Oriole Crescent	2	25	13	-48.0%	0.970	25.8	13.4
8	Wentworth / Lottridge	1 & 2	29	25	-13.8%	0.767	37.8	32.6
9	Wellington / West	1	10	5	-50.0%	0.083	120.7	60.4
10	Holton / Barnesdale	1 & 2	15	10	-33.3%	0.206	73.0	48.6

Figure 21: Frequency of Robbery Incidents in Target Areas, 2009 & 2102

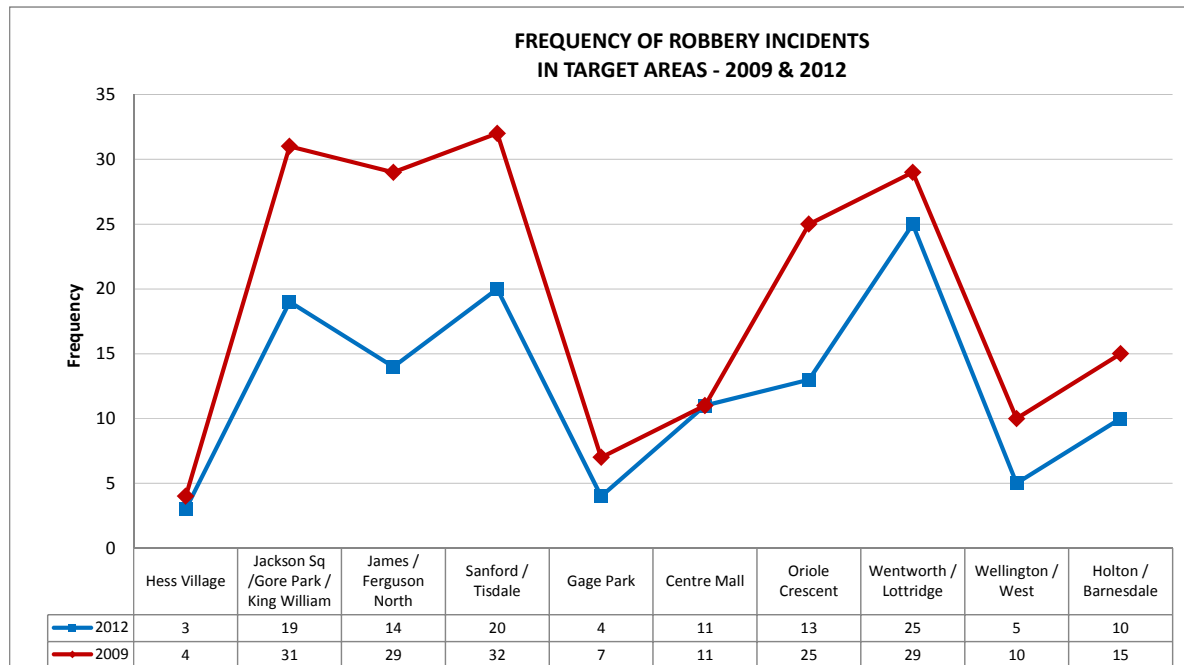|	Hess Village	Jackson Sq /Gore Park / King William	James / Ferguson North	Sanford / Tisdale	Gage Park	Centre Mall	Oriole Crescent	Wentworth / Lottridge	Wellington / West	Holton / Barnesdale
2012	3	19	14	20	4	11	13	25	5	10
2009	4	31	29	32	7	11	25	29	10	15

Table 8: Frequency & Density of Priority Zero Calls-for-Service in Target Areas, 2009 & 2012

PRIORITY ZERO CALLS-FOR-SERVICE								
ID	TARGET AREA	DIV	2009 FREQ	2012 FREQ	DIFF	AREA (Sq Km)	2009 DENSITY	2012 DENSITY
1	Hess Village	1	1	0	-1	0.048	20.7	0.0
2	Jackson Sq/Gore Park/ King William	1	5	1	-4	0.144	34.8	7.0
3	James/Ferguson North	1	4	3	-1	0.251	16.0	12.0
4	Sanford/Tisdale	1	8	0	-8	0.128	62.5	0.0
5	Gage Park	2	0	0	0	0.338	0.0	0.0
6	Centre Mall	2	0	1	1	0.521	0.0	1.9
7	Oriole Crescent	2	4	5	1	0.970	4.1	5.2
8	Wentworth/Lottridge	1 & 2	5	3	-2	0.767	6.5	3.9
9	Wellington/West	1	0	0	0	0.083	0.0	0.0
10	Holton/Barnesdale	1 & 2	4	3	-1	0.206	19.5	14.6

AN OVERVIEW OF VIOLENCE-PRONE AREAS IN HAMILTON – THREE YEARS LATER

Table 9: Frequency & Density of Shooting Incidents in Target Areas, 2009 & 2012

	SHOOTING INCIDENTS							
ID	TARGET AREA	DIV	2009 FREQ	2012 FREQ	DIFF	AREA (Sq Km)	2009 DENSITY	2012 DENSITY
1	Hess Village	1	0	1	1	0.048	0.0	20.7
2	Jackson Sq/Gore Park/ King William	1	1	0	-1	0.144	7.0	0.0
3	James /Ferguson North	1	1	0	-1	0.251	4.0	0.0
4	Sanford/Tisdale	1	1	1	0	0.128	7.8	7.8
5	Gage Park	2	0	0	0	0.338	0.0	0.0
6	Centre Mall	2	0	0	0	0.521	0.0	0.0
7	Oriole Crescent	2	2	0	-2	0.970	2.1	0.0
8	Wentworth/Lottridge	1 & 2	0	2	2	0.767	0.0	2.6
9	Wellington/West	1	0	1	1	0.083	0.0	12.1
10	Holton/Barnesdale	1 & 2	1	0	-1	0.206	4.9	0.0

3.   Rank Order

Table 10 presents the target areas in rank order based on volume and density of events using the three larger datasets (Violent and Assault calls-for-service and Robbery incidents). The Shooting and Priority Zero data set were used to break any ties. The results of the 2009 rank order is included for comparison.

Referring to **Table 10,** the rank order of the target areas in 2012 is very similar to 2009 indicating that again, the highest concentration of violent events is centered around the downtown core.

**Table 10: Target Areas in Rank Order – 2009 & 2012**

TARGET AREA	DIV	2009 RANK	2012 RANK
Jackson Sq/Gore Park/King William	1	1	1
Sanford/Tisdale	1	2	3
Hess Village	1	3	2
James/Ferguson North	1	4	4
Wellington/West	1	5	5
Holton/Barnesdale	1&2	6	6
Wentworth/Lottridge	1 & 2	7	7
Centre Mall	2	8	8
Concession Street	3	9	N/A
Limeridge Mall	3	10	N/A
Albright/Quigley/St Andrews	2	11	N/A
Oriole Crescent	2	12	9
Mohawk College	3	13	N/A
Gage Park	2	14	10
Upper James/Brucedale	3	15	N/A
Delawanna	2	16	N/A
McMaster University	1	17	N/A

F.   TEMPORAL ANALYSIS

The violent events occurring in the Violence-Prone area were further examined by time. The results are shown in **Figures 22**, **23** and **24**.

Referring to **Figure 22**, the colour variations are based on the number of Violent calls-for-service reported in 2012 by the hour-of-day and day-of-week. The most notable pattern is shown with the orange and red symbology. Between approximately 1400 hours to 1700 hours; from approximately 1900 hours to midnight with the pattern strengthening on Thursdays, Fridays and Saturday, and; from midnight to approximately 0400 hours on Saturdays and Sundays.

Figure 22: Occurrence of Violent Calls-for Service in Violence-Prone Area - 2012
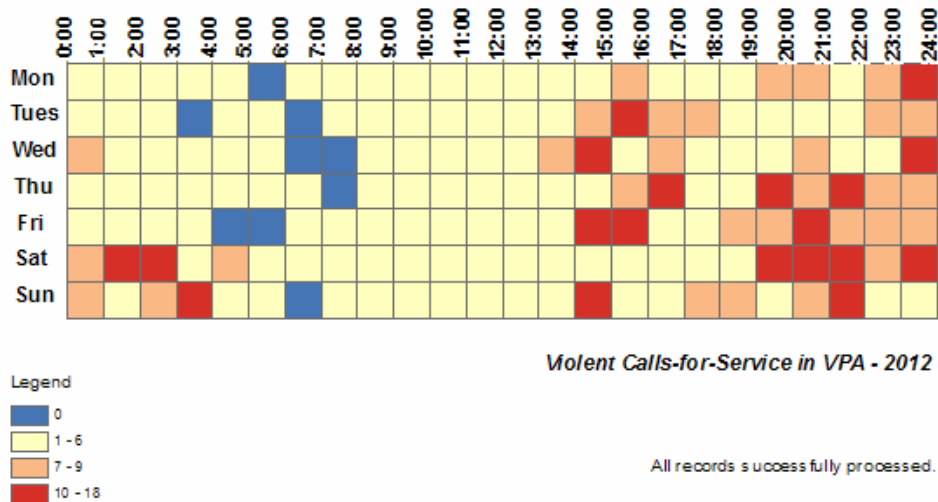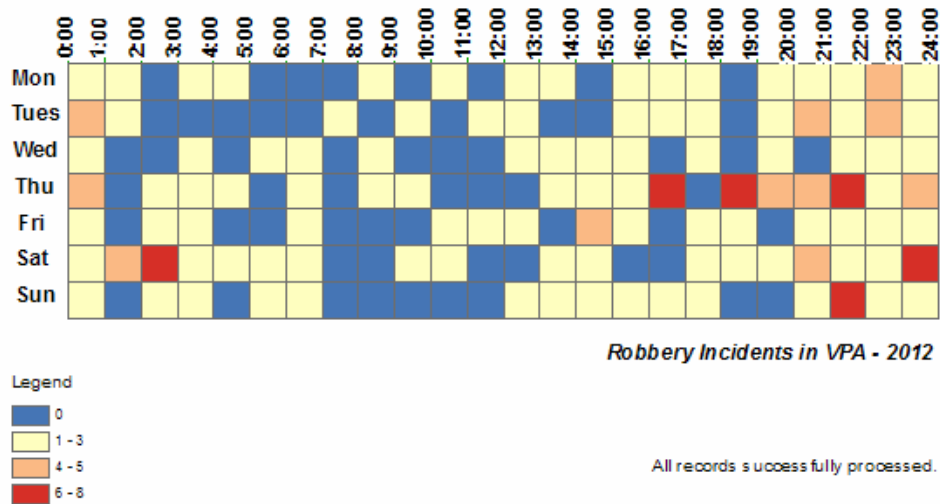

Referring to **Figure 23**, the number of Assault calls-for-service begin around 1400 hours to 2200 hours on Mondays, Tuesdays, Wednesdays; from 1700 hours to midnight on Thursdays, Fridays, Saturdays and Sundays, and; midnight to 0400 hours on Saturday and Sunday mornings.

Figure 23: Occurrence of Assault Calls-for Service in Violence-Prone Area - 2012

Assault Calls-for-Service in VPA - 2012

Legend
- 0
- 1 - 10
- 11 - 17
- 19 - 27

All records successfully processed.
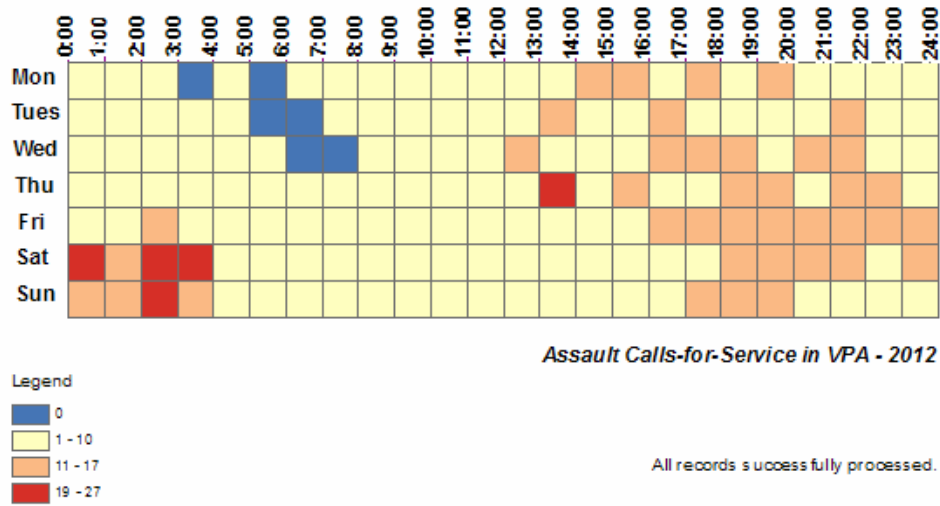
Referring to **Figure 24**, there is no visible pattern to the Robbery incidents when examined by time. This could be due to the small data set or the result of analyzing all types of robberies, i.e. commercial, financial, public and residential as one homogeneous group.

Figure 24: Occurrence of Robbery Incidents in Violence-Prone Area - 2012

Robbery Incidents in VPA - 2012

Legend
- 0
- 1 - 3
- 4 - 5
- 6 - 8

All records successfully processed.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis and findings presented in this study, the following recommendations are put forth:

1.   The strategy to focus police resources below the escarpment, in the downtown core and in the areas of high concentration of violent events while maintaining the flexibility to redeploy these resources, rapidly, to any location in within the City of Hamilton in response to a public safety concerns should be continued.

2.   As discussed in the findings, the intensity of several pockets of concentrated violent events identified in the 2009 study have decreased in 2012. While this is a positive impact, HPS should continue to monitor these areas for spikes or gradual increases in violent events.

3.   Further ongoing analysis should be conducted in the violence-prone areas to actively track all crime and disorder issues. These analysis should be balanced with the Service-wide situational crime variances and guide the deployment of officers to the areas of greatest need.

4.   As outlined in the findings of this report, the impact of the intervention strategies that were implemented between 2010 and 2012, are notable and evident Service-wide. These impacts and the interconnection of the strategies should be included in the HPS ongoing communication strategies. It is important to be clear that community engagement, crime prevention and enforcement are integral components of the NSP. Strategies such as ACTION are built upon the NSP priorities and are not simply zero-tolerance enforcement initiatives.

AN OVERVIEW OF VIOLENCE-PRONE AREAS IN HAMILTON – THREE YEARS LATER

BIBLIOGRAPHY

1.   Buist, Steve, *Code Red*, Hamilton Spectator, 2010, Retrieved March 26, 2013 from: http://www.thespec.com/topic/codered

2.   City of Hamilton, *Neighbourhood Development Strategy*. Retrieved March 2013 from: http://www.hamilton.ca/ProjectsInitiatives/NeighbourhoodDevelopment/

3.   Gifford, Debbie, *An Overview of Violence-Prone Areas in Hamilton*. Hamilton Police Service, April 2010.

4.   Gifford, Debbie, *An Overview of Violence-Prone Areas in Hamilton Post Deployment*. Hamilton Police Service, November 2010.

5.   Gifford, Debbie, *ACTION Deployment One Year Later*. Hamilton Police Service, August 2011.

6.   Mason, Will, *Proposal to Create the Hamilton Anti-Violence & Empowered Neighbourhood Unit*. Hamilton Police Service, February 2010.

7.   Mayo, Sara, & Bahkt, Lubabah, *Neighbourhood Profiles*. Social Planning Research Council, March, 2012.

8.   Mayo, Sara, *Profile of Hamilton's Downtown Area*. Social Planning Research Council, January, 2012.

9.   Scheider, Matthew, *Community Policing Nugget: Broken Windows and Community Policing*. Department of Justice, Community Oriented Policing Services, Retrieved April 25, 2013 from http://cops.usdoj.gov/