

USING ADVANCED EXCEL TECHNIQUES TO PROVIDE DATA DRIVEN SOLUTIONS FOR REDUCING TRAFFIC OFFENCES IN THE CITY OF DENVER

AGENDA



- **Executive Summary**
 - Problem
 - Solution Approach
 - Key Findings
 - Recommendations
- **Key Findings**
 - Offence By District
 - Offence By Neighbourhood
 - Offence By Time
 - Bicycle & Pedestrian Involvement
- **Recommendations**
- **Appendix**

EXECUTIVE SUMMARY

Problem

- Analysis: Find patterns in the traffic offences that occurred the City & County of Denver in 2012 to provide effective solutions
- Techniques: How to find patterns in the data?
- Visualization: Present key findings in a way easy to understand

Solution Approach

- Data Audit: Scan the data to review its completeness and accuracy
- Data Cleaning: Fix the missing, redundant and unimportant information
- Perform Analysis using EXCEL Tools like 3D Maps, Power Pivots, Slicers, Data Modeling & Transformation

Key Findings

- Identify districts & neighbourhoods with most offences
- Find out days, time of the day etc. reporting most offences
- Identify the number of victims such as cyclists & pedestrians
- Hot Spot Mapping of offences by victim, offence type.

Recommendations

Data driven

recommendations have been drafted for the following criterias:

- Areas that need patrolling
- Days of the week in need of more police
- Districts with most offences
- Months that require extra patrolling
- Offence type that needs to be curbed on a priority basis

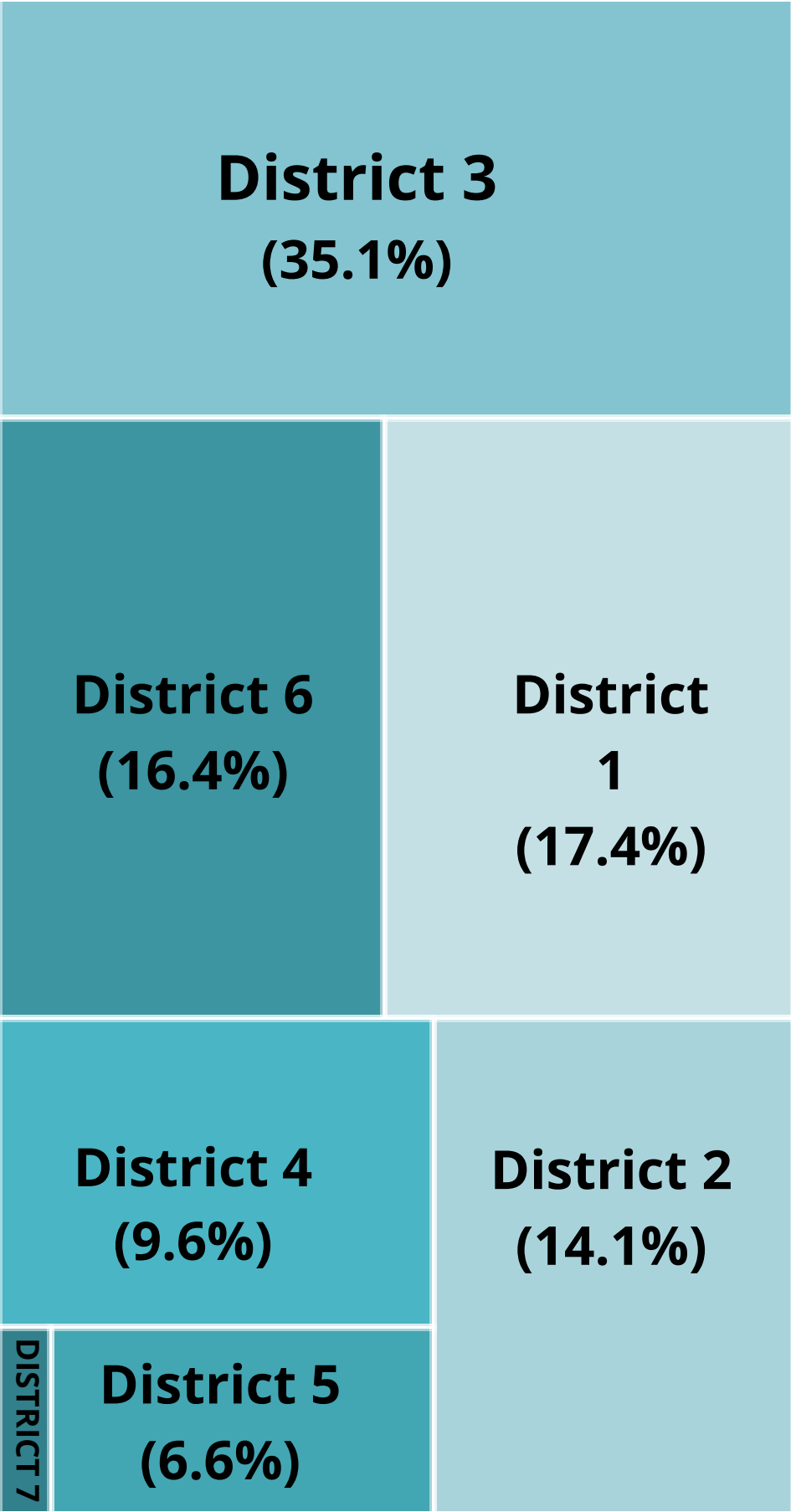


KEY FINDINGS

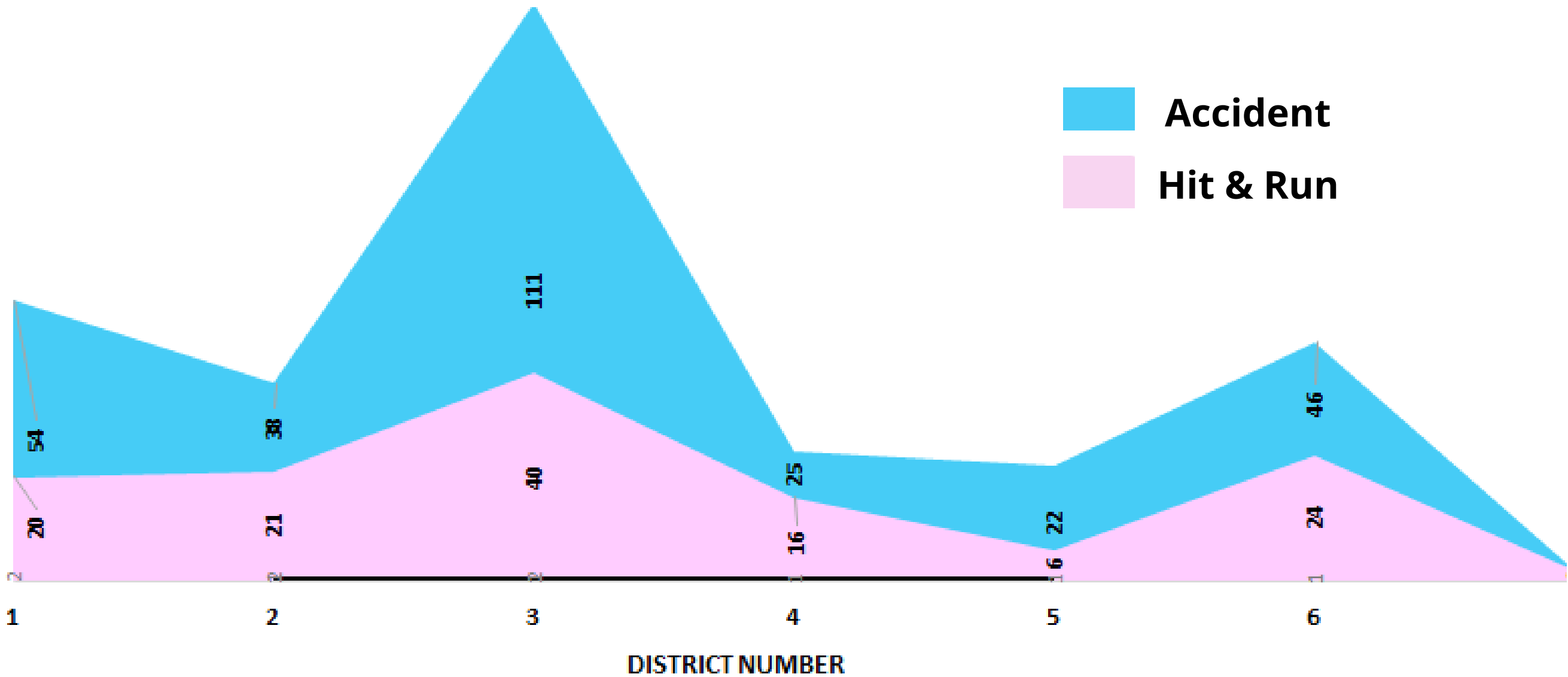


OFFENCE BY DISTRICT

Offence % in 7 Districts



Most Common Offence Type in 7 Districts

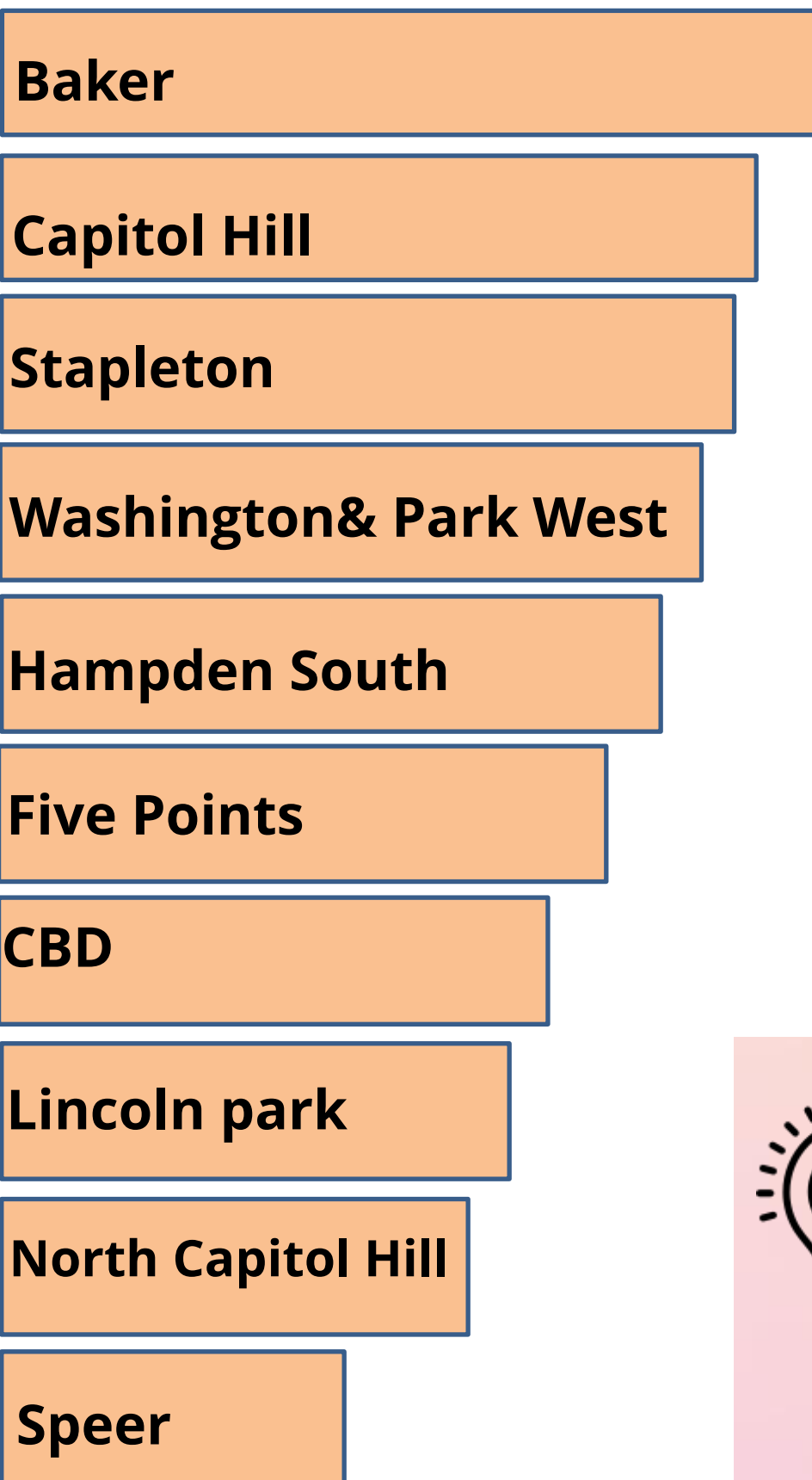


- District 3, 1 and 6 respectively are top three in terms of offence rate
- Accidents are considerably high in District 3 compared to other districts
- District 3 also has the most number of neighbourhoods (25) which makes it susceptible to report more offences

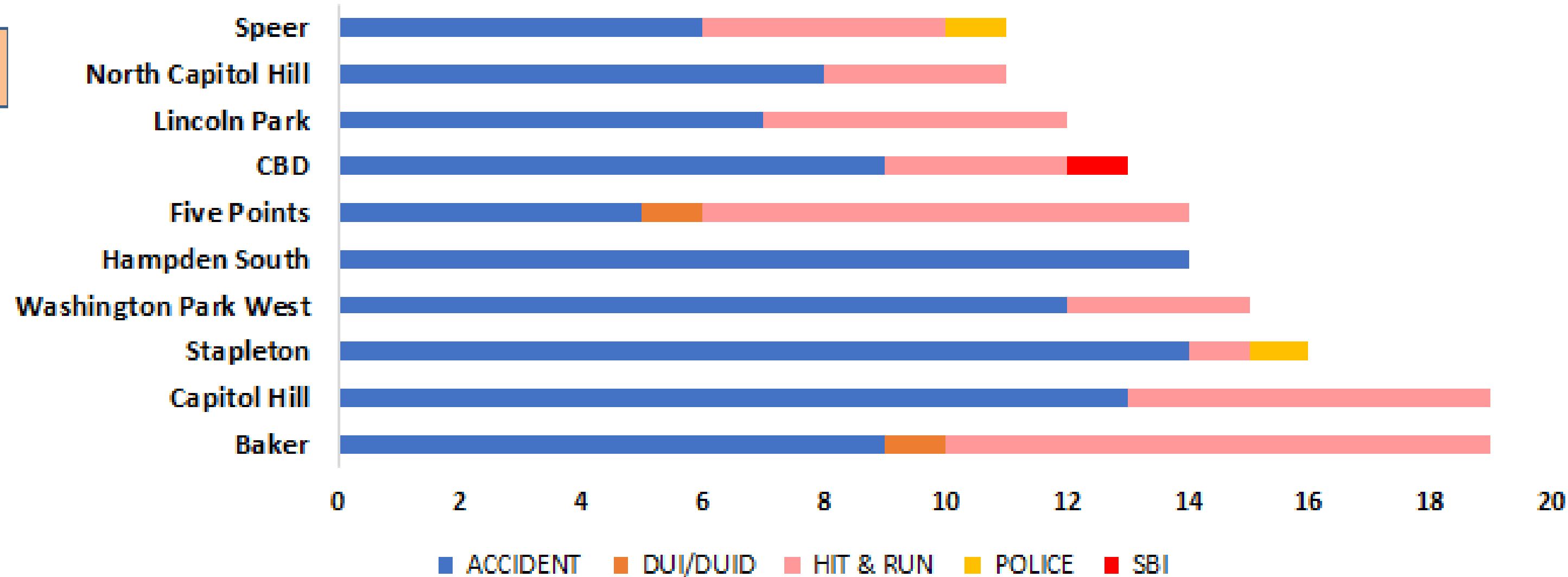
Note: Data on population not available so results might be skewed

OFFENCE BY NEIGHBOURHOOD

Neighbourhoods with number of Offences >10



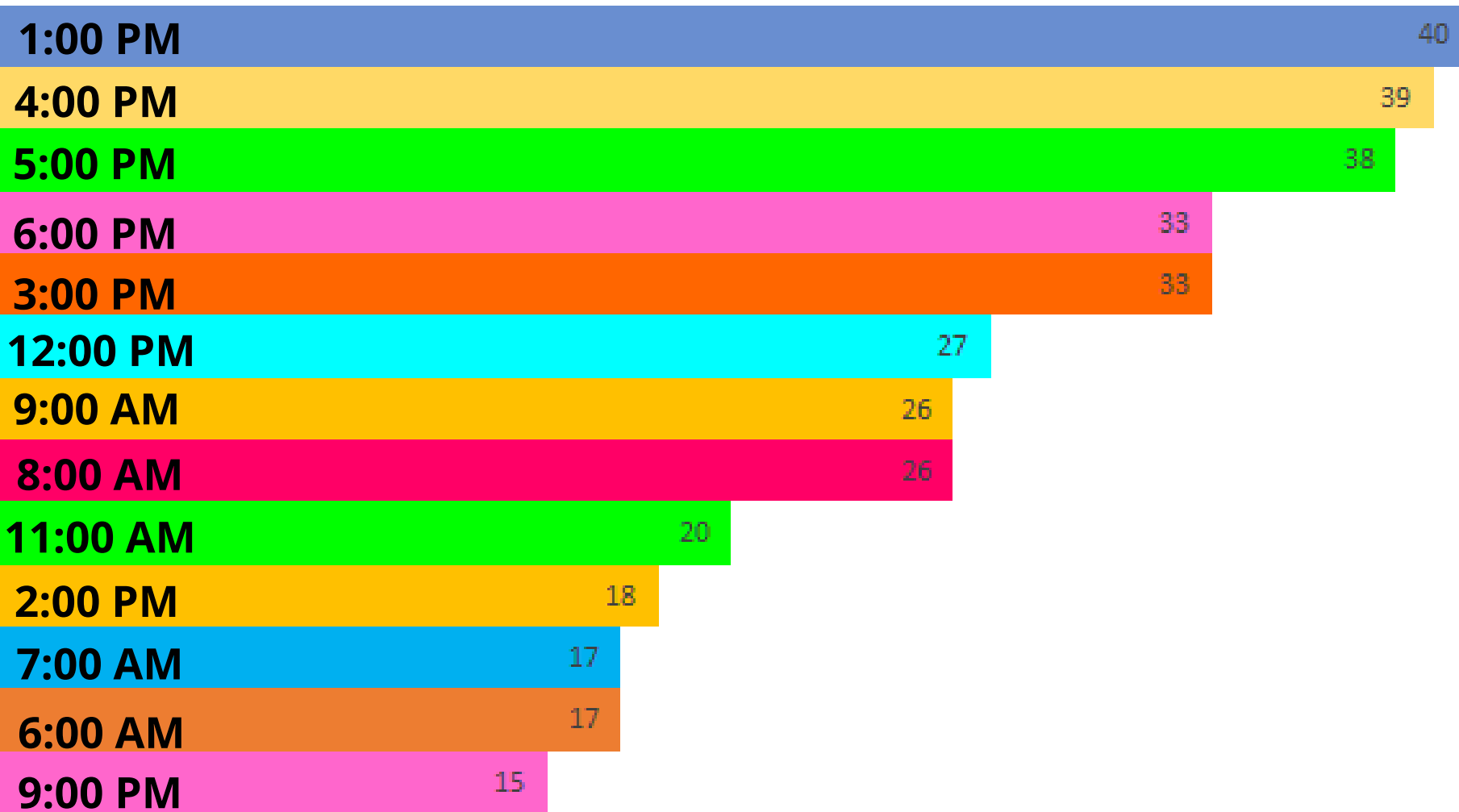
Most Common type of offence in different neighbourhoods



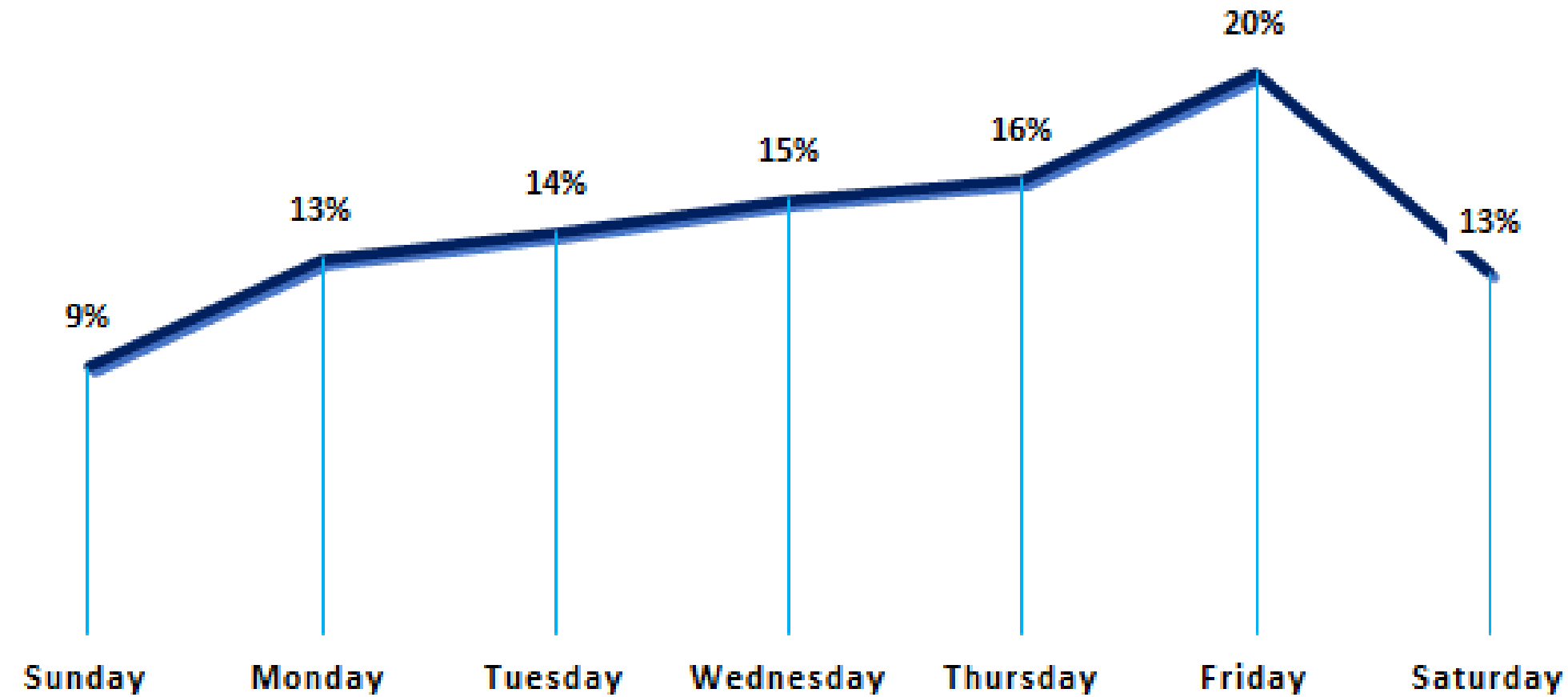
- At least 10 neighbourhoods with number of offences >10
- Baker (D3) & Capitol Hill (D6) have highest number of offences (approx. 20)
- Hampden South (D3) only has Accidents (approx. 15)
- Accidents & Hit and Run most common in these neighbourhoods

OFFENCE BY TIME

Number of Offences by Hour of the Day



Offence Percentage by Days of the Week



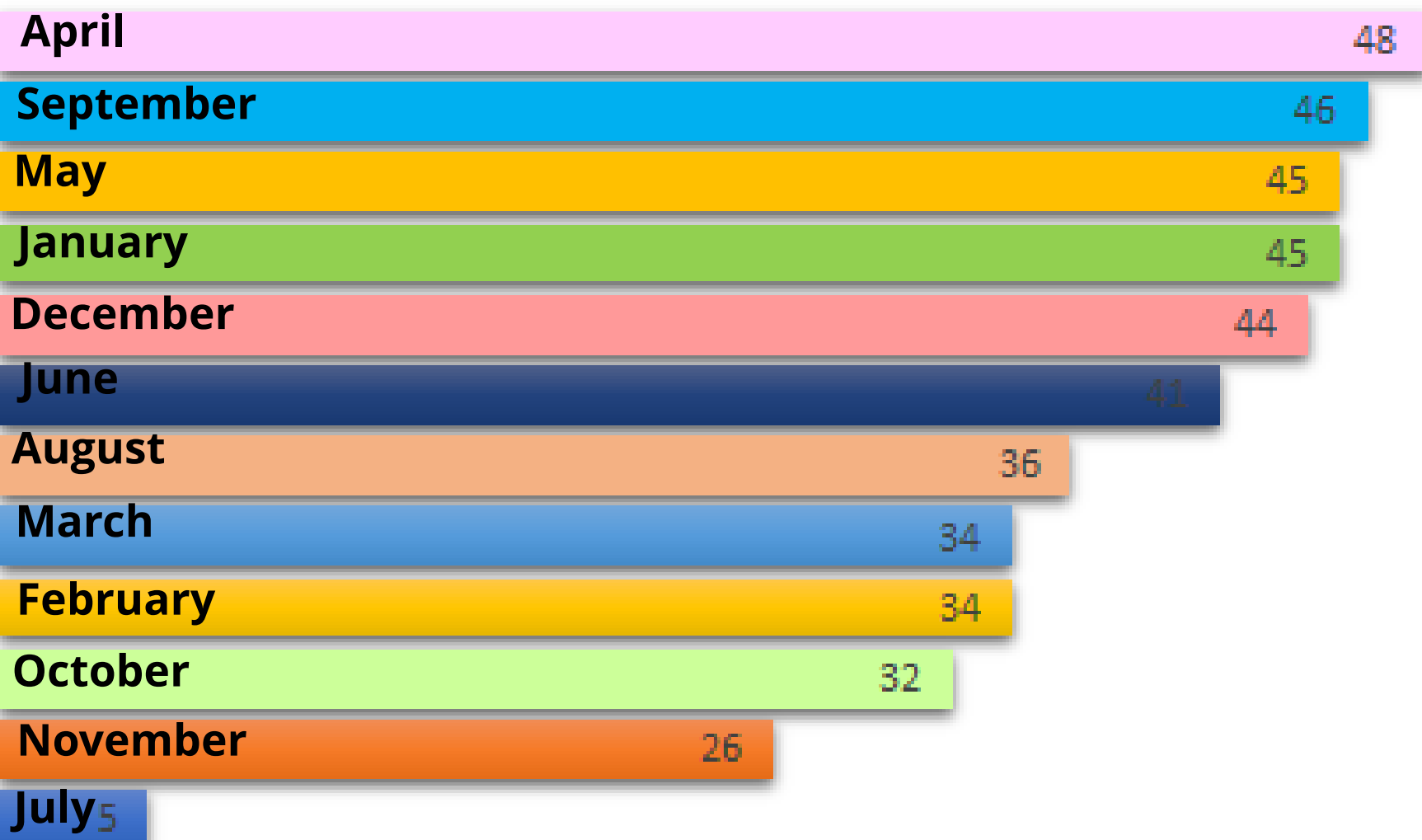
- Most Offences- 1:00PM
- Least Offences- After 9:00 PM
- Time Frame with most offences: 4-6PM
- # of Offences b/w 4-6PM: 110



- Most Offences: Friday (20%)
- Least Offences: Sunday (9%)
- Offences have seen a continuous increase From Sunday to Friday

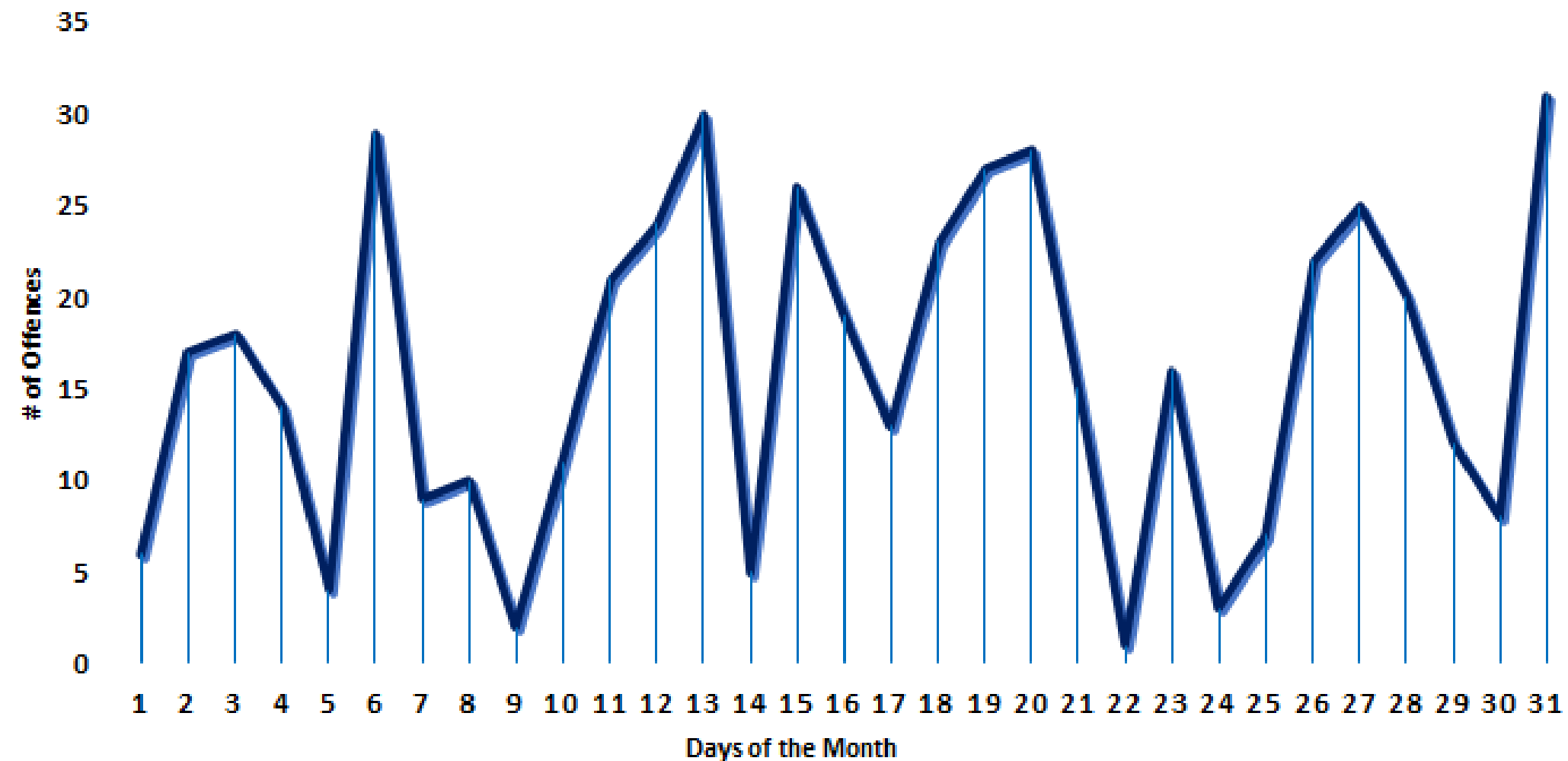
OFFENCE BY TIME (contd.)

Offences By Month



- Three months with most Offences: April, September, May
- Least Offences: July (5)

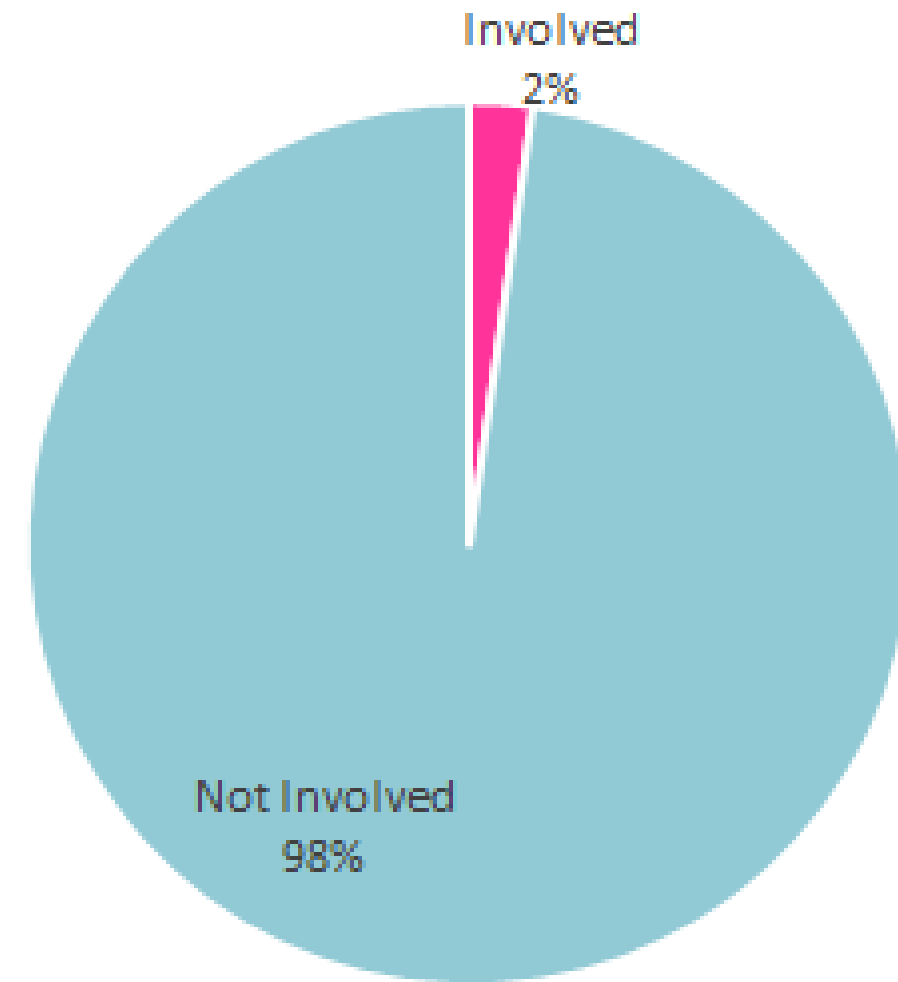
Offences By Days of the Month



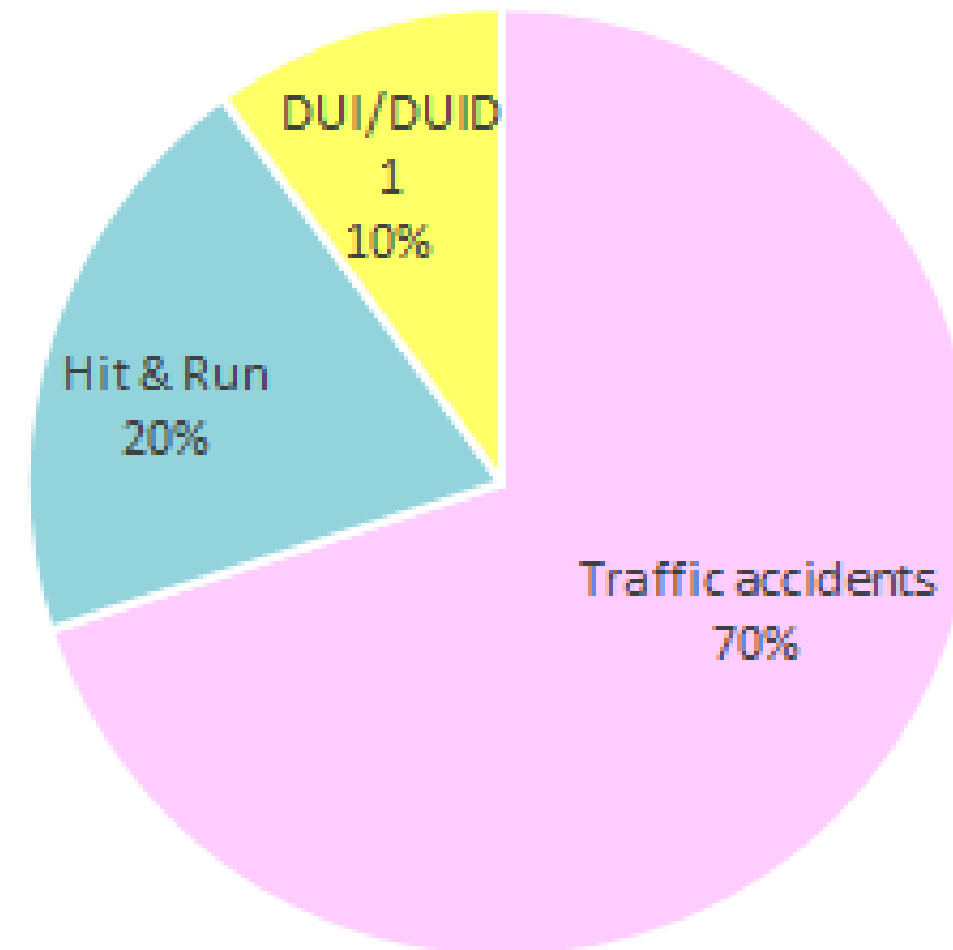
- Peak Offence Days: 6th, 13th, 20th, 27th and 31st DoM (Mostly Fridays in 2012)
- Low Offence Days: (Mostly Mid Week) 5th, 9th, 14th, 22nd, 24th and 30th DoM

BICYCLE INVOLVEMENT

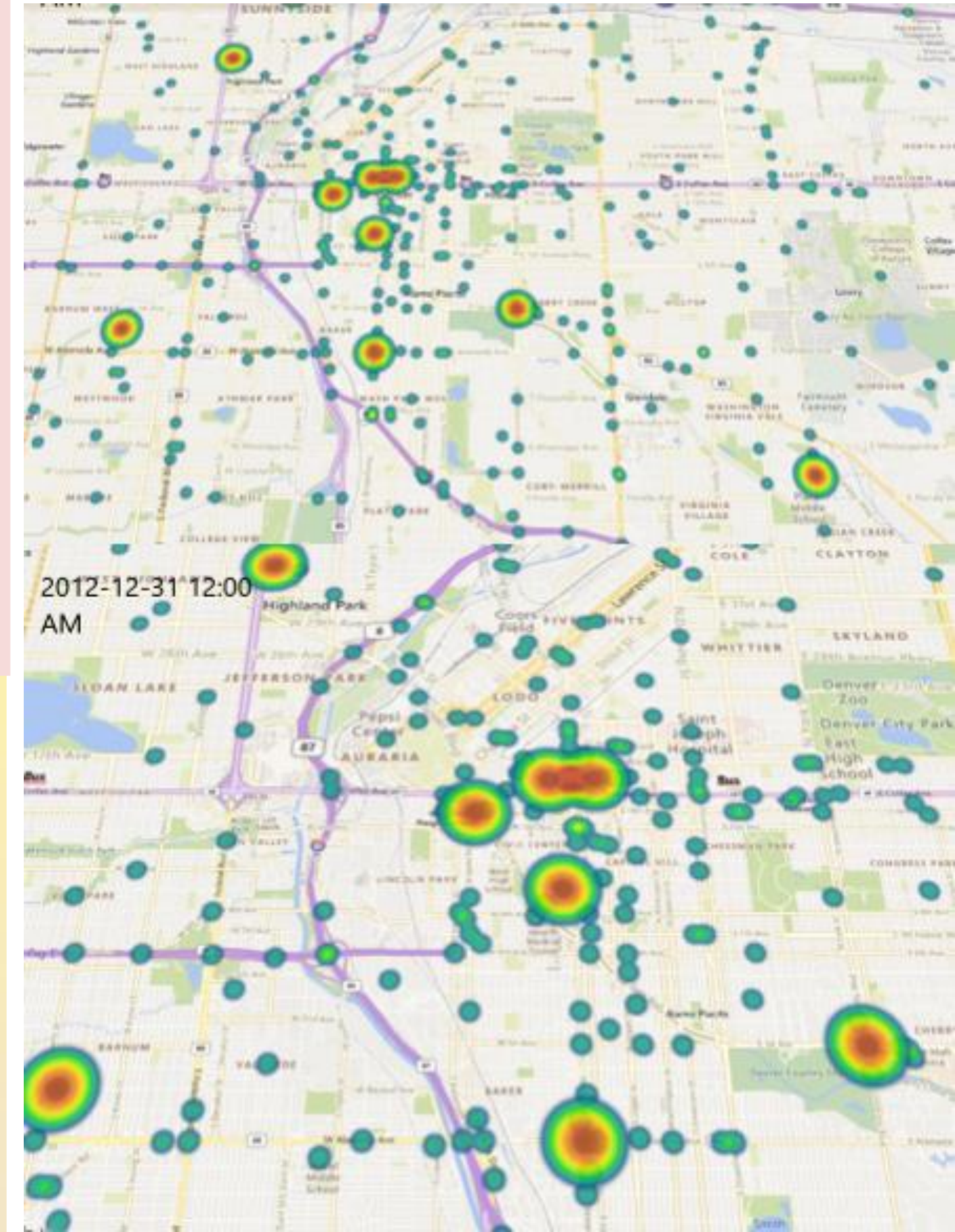
Percentage of bicycles involved



Offence Type involving Bicycles



Hot-Spots where Bicycles are involved

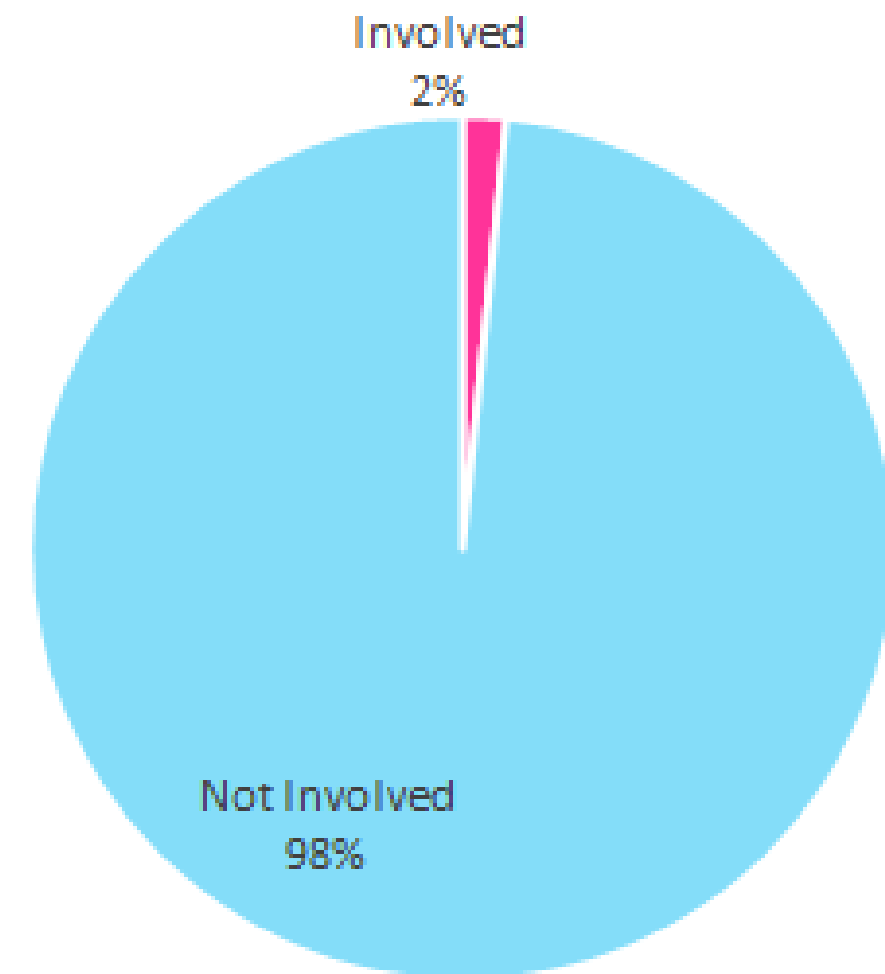


- Bicycle involvement in overall offence- 2% (Low)
- Type of offence in which bicycles are most involved: *Traffic Accidents (70%)*
- Location where Bicycles are mostly involved: *North Capitol Hill, City Park West and CBD*

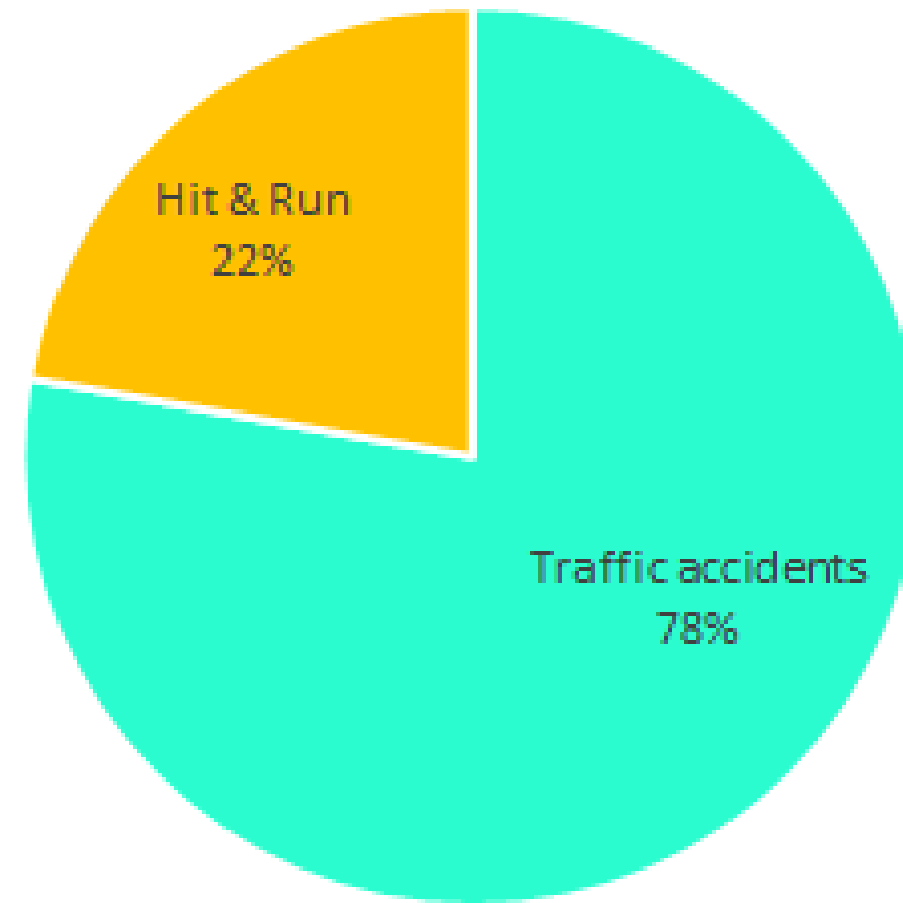


PEDESTRIAN INVOLVEMENT

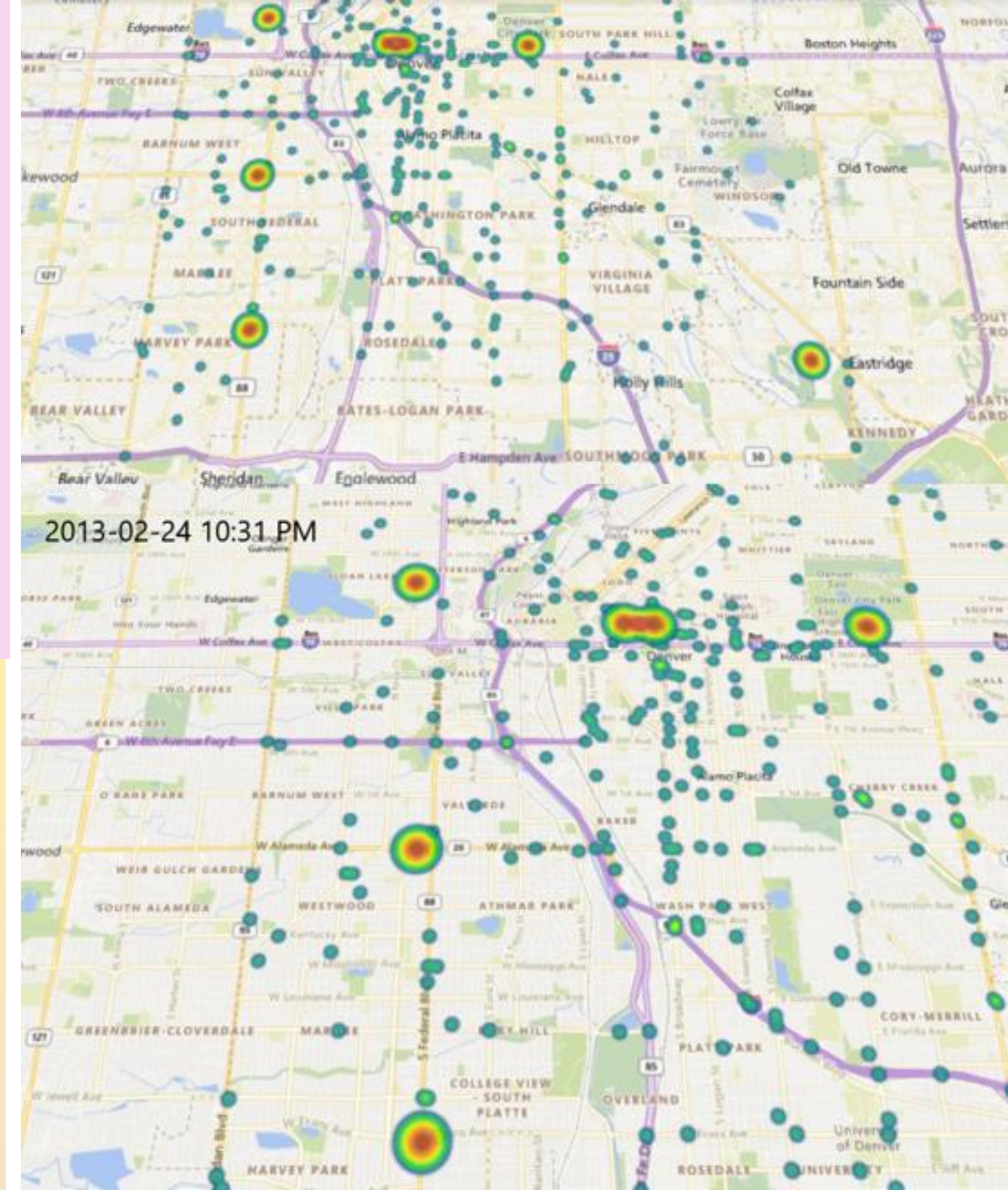
Percentage of Pedestrians involved



Offence Types involving Pedestrians



Hot-Spots where Pedestrians are involved



- Pedestrians involvement in overall offence- 2% (Low)
- Type of offence in which pedestrians are mostly involved: *Traffic Accidents (78%)*
- Location where pedestrians are mostly involved: *City park, CBD, College View - South Platte*



RECOMMENDATIONS

- ***Prioritize Offence Type to be controlled:*** Accidents and Hit Runs are major offence types so more emphasis to reduce them.
- ***Target Districts:*** Districts 3 has most offences followed by Districts 1 and 6 respectively, so there should be stricter law enforcement in these districts.
- ***Neighbourhood:*** Baker, Capitol Hill, Stapleton have reported most offences so authorities should be alert in these neighbourhoods.
- ***Time of the Day:*** More traffic police should be deployed between 1:00PM to 6:00PM as most offences occur between these hours.
- ***Day of the Week:*** Friday witnesses most offences so more patrolling on Fridays.

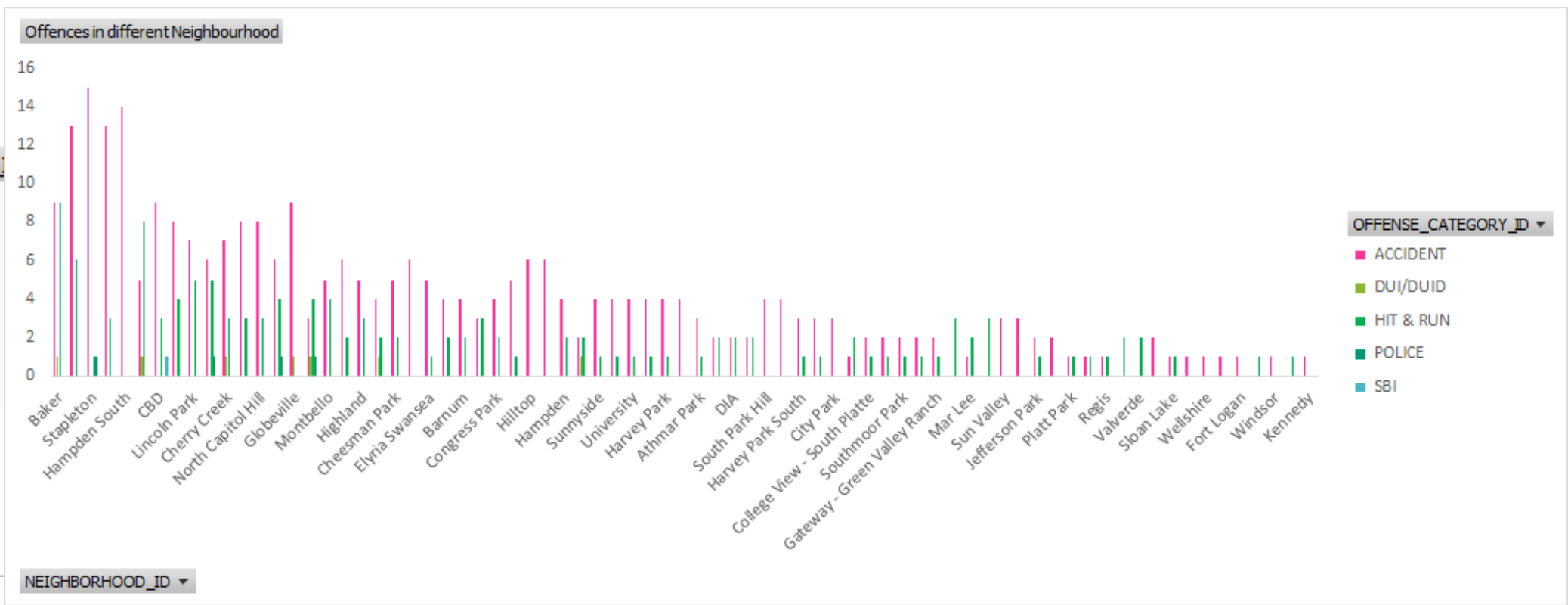
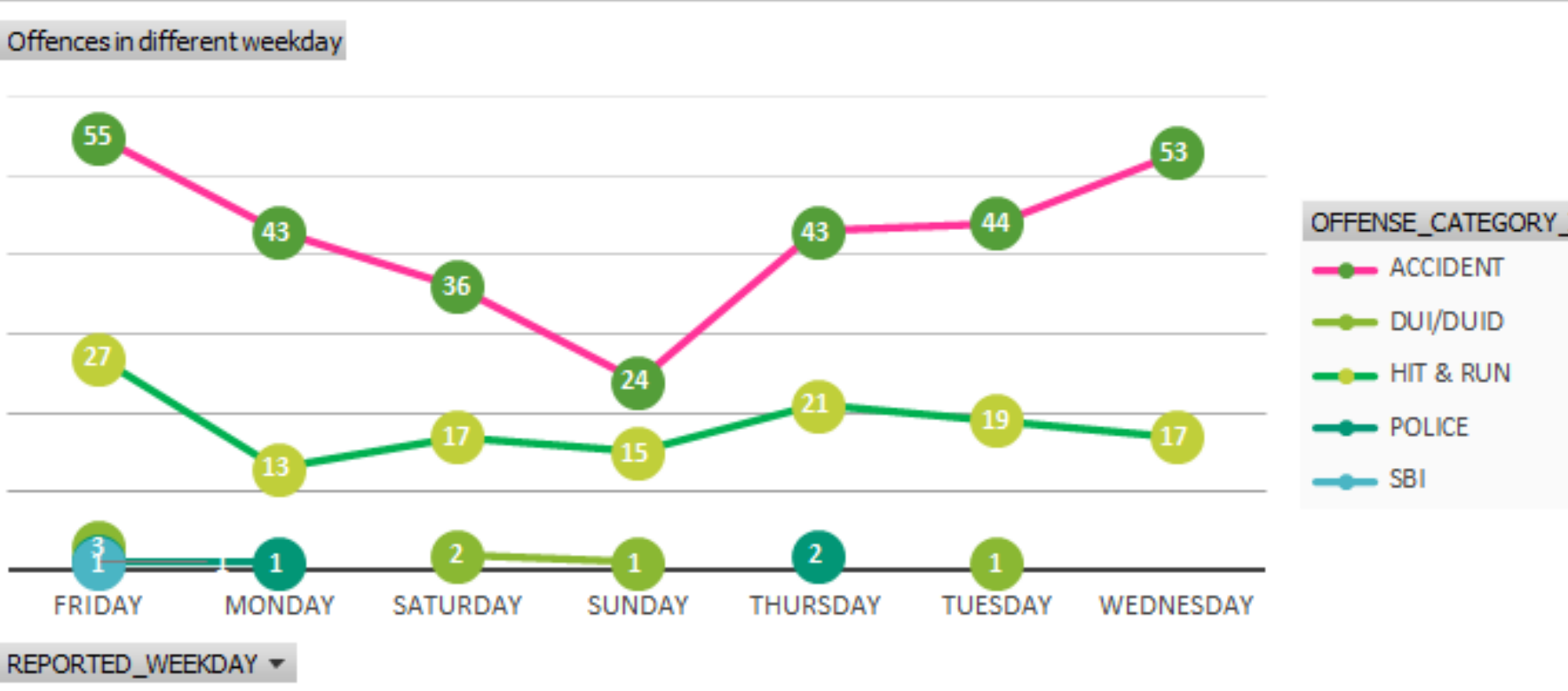
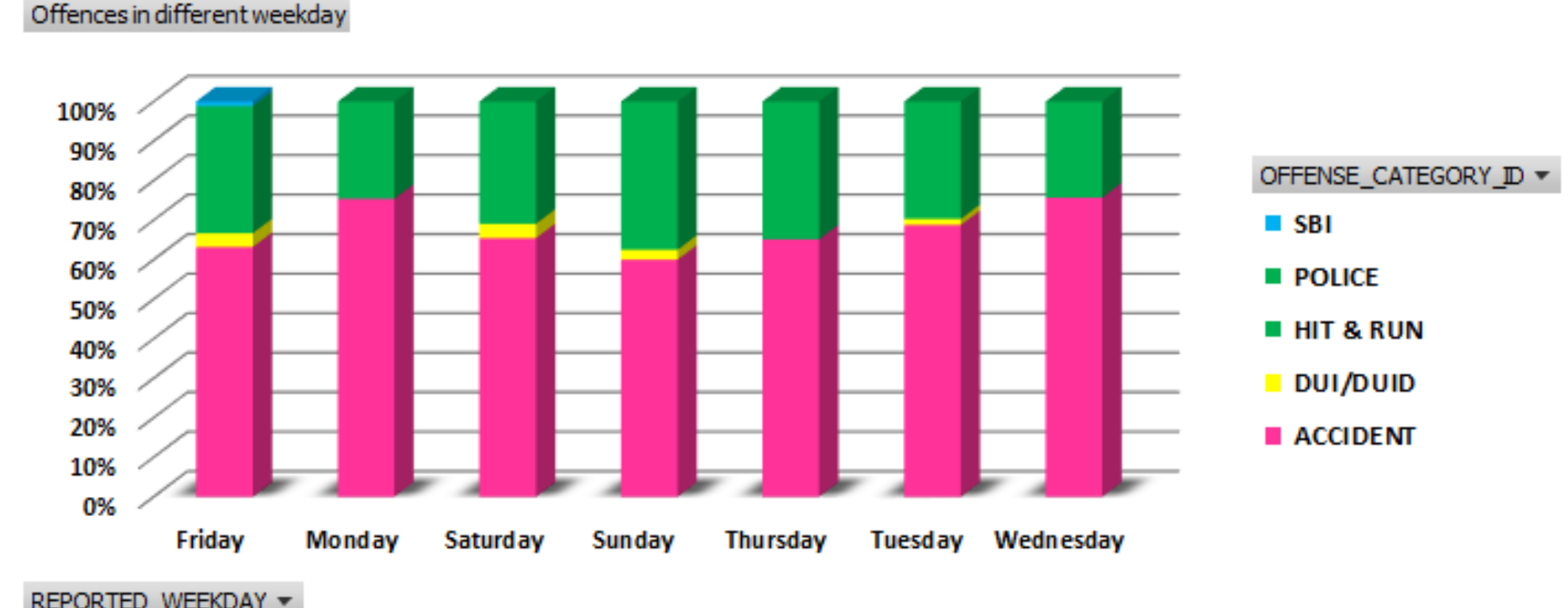
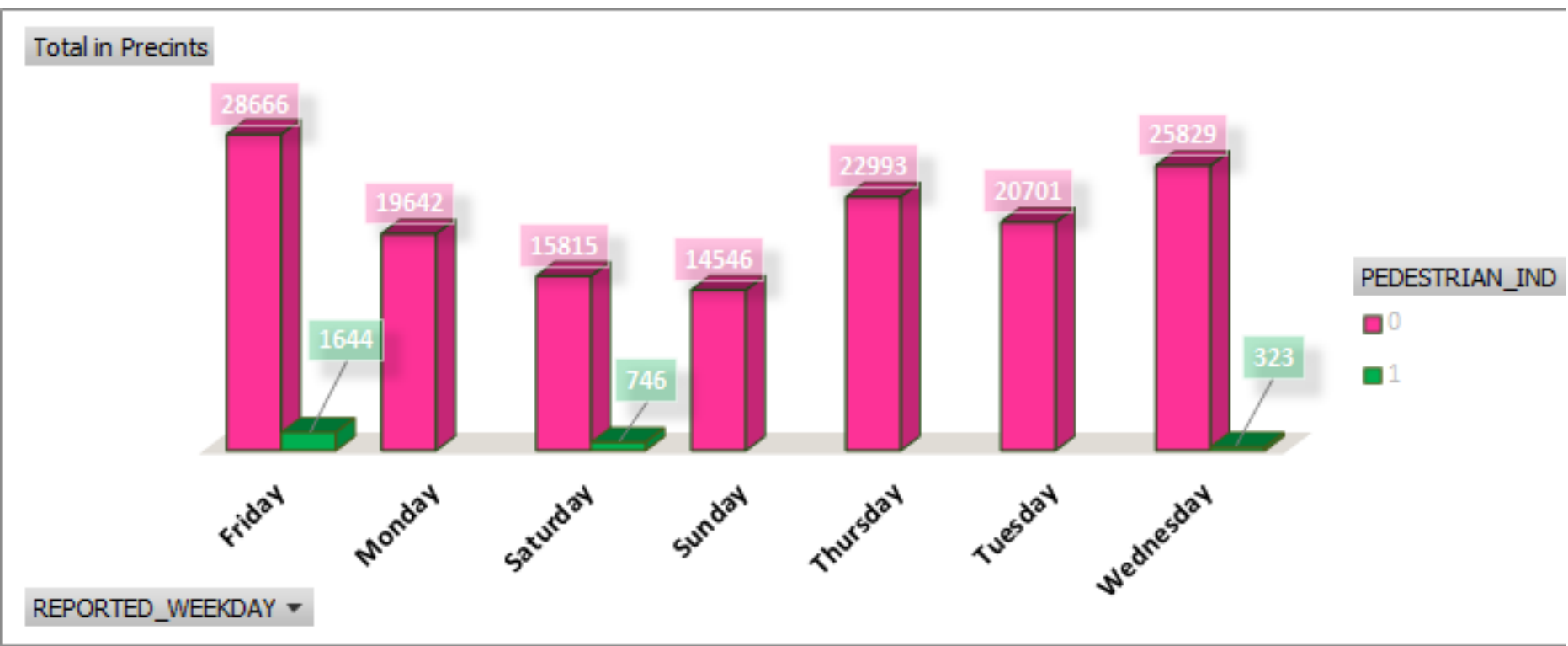
RECOMMENDATIONS

- ***Month of the Year:*** April has most offences followed by September, May and January respectively so there needs to be more police during these months.
- ***Days of the Month:*** Offences peak mostly on the 6th, 13th, 20th and 31st day of the month (in the gap of 7 days). More traffic Police should be used on these days.
- ***Bicycle Involvement:*** Bicycles are involved in 70% of traffic accidents. Locations such as North Capitol Hill, City Park West and CBD are hot spots. More surveillance and stricter enforcement in these areas.
- ***Pedestrian Involvement:*** Pedestrians are involved in 78% of traffic accidents. City park, CBD, College View - South Platte are major hot spots. There needs to be stricter traffic law enforcement in these areas.

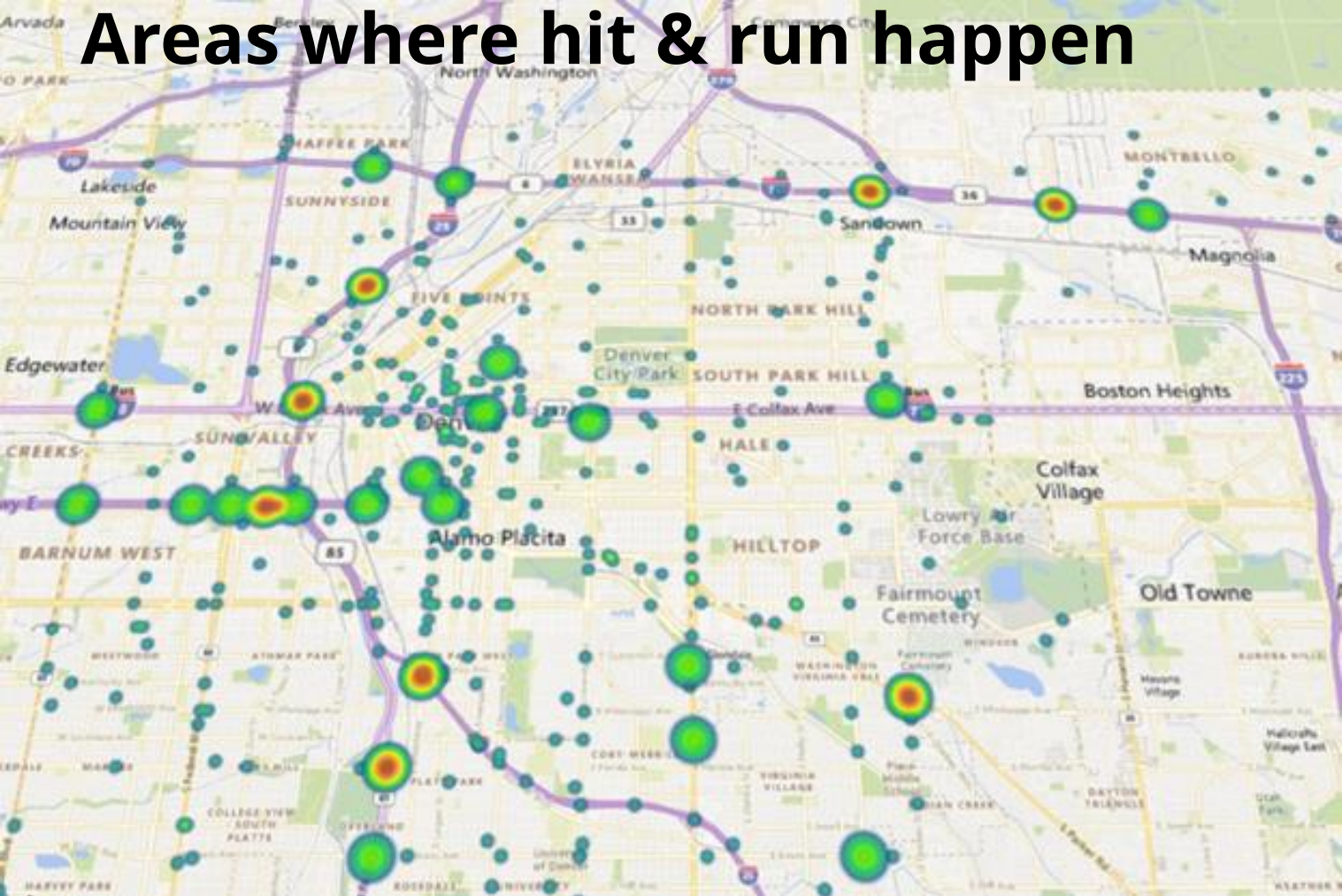
Thank You

Any Questions?

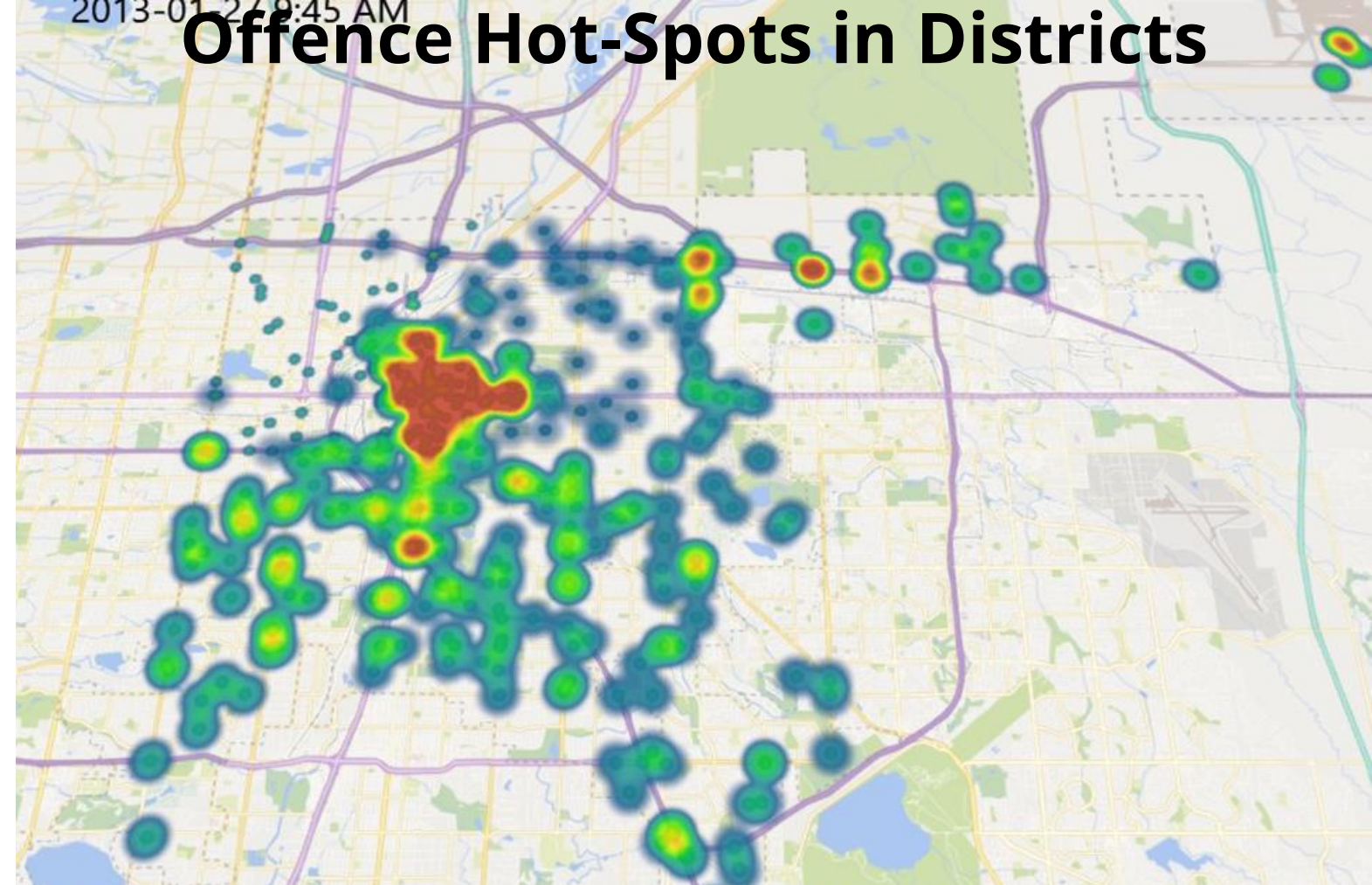
APPENDIX



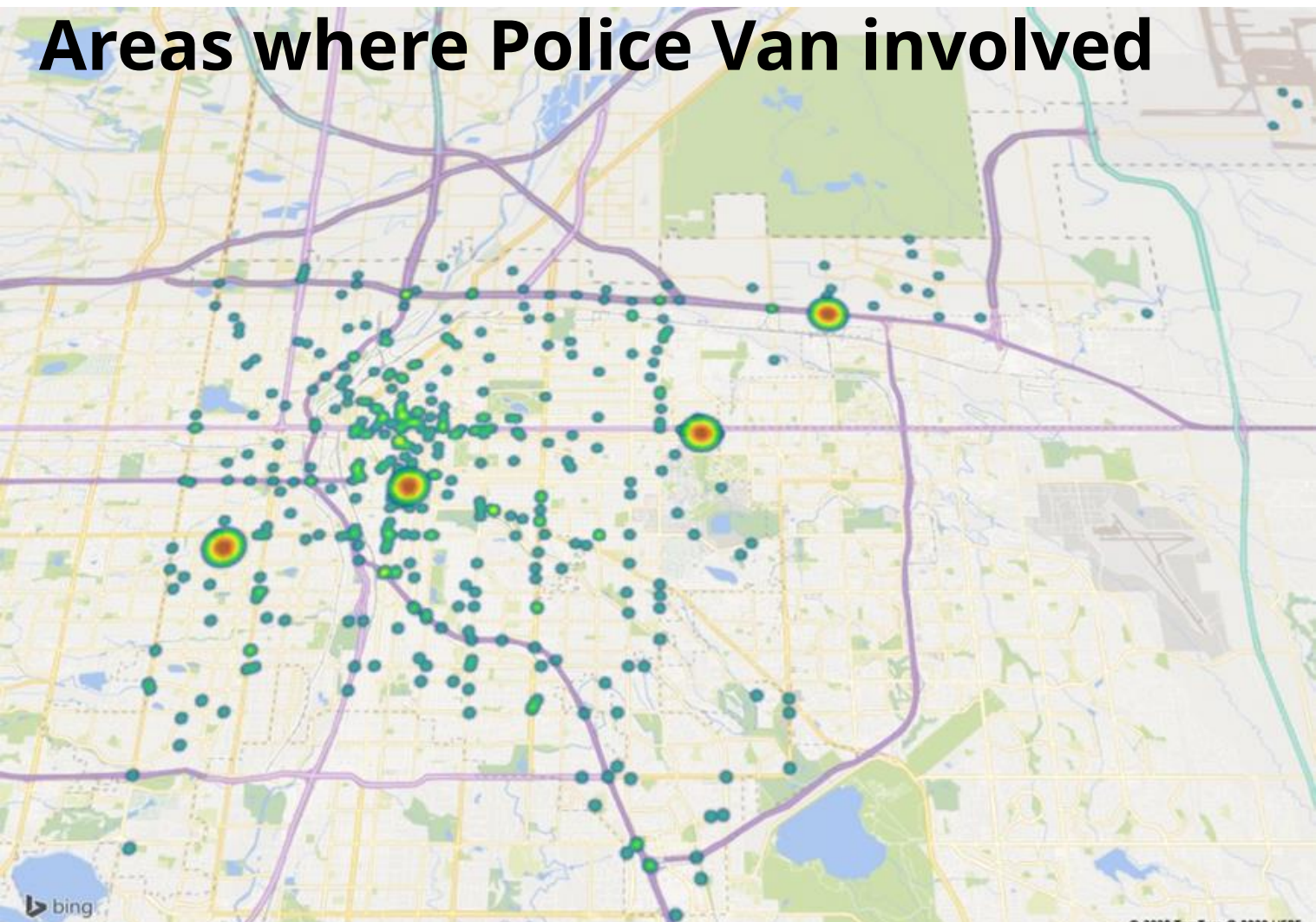
Areas where hit & run happen



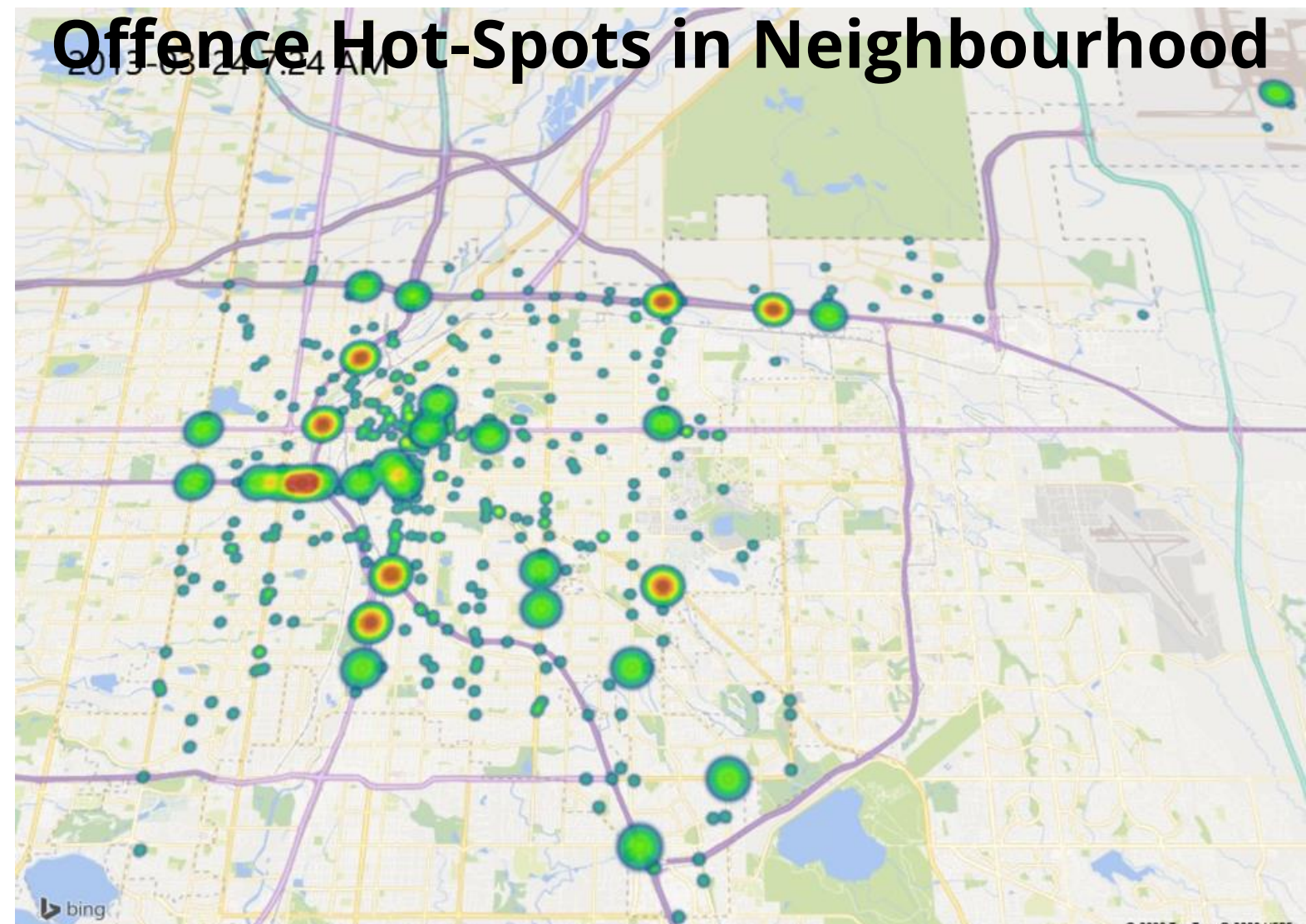
Offence Hot-Spots in Districts



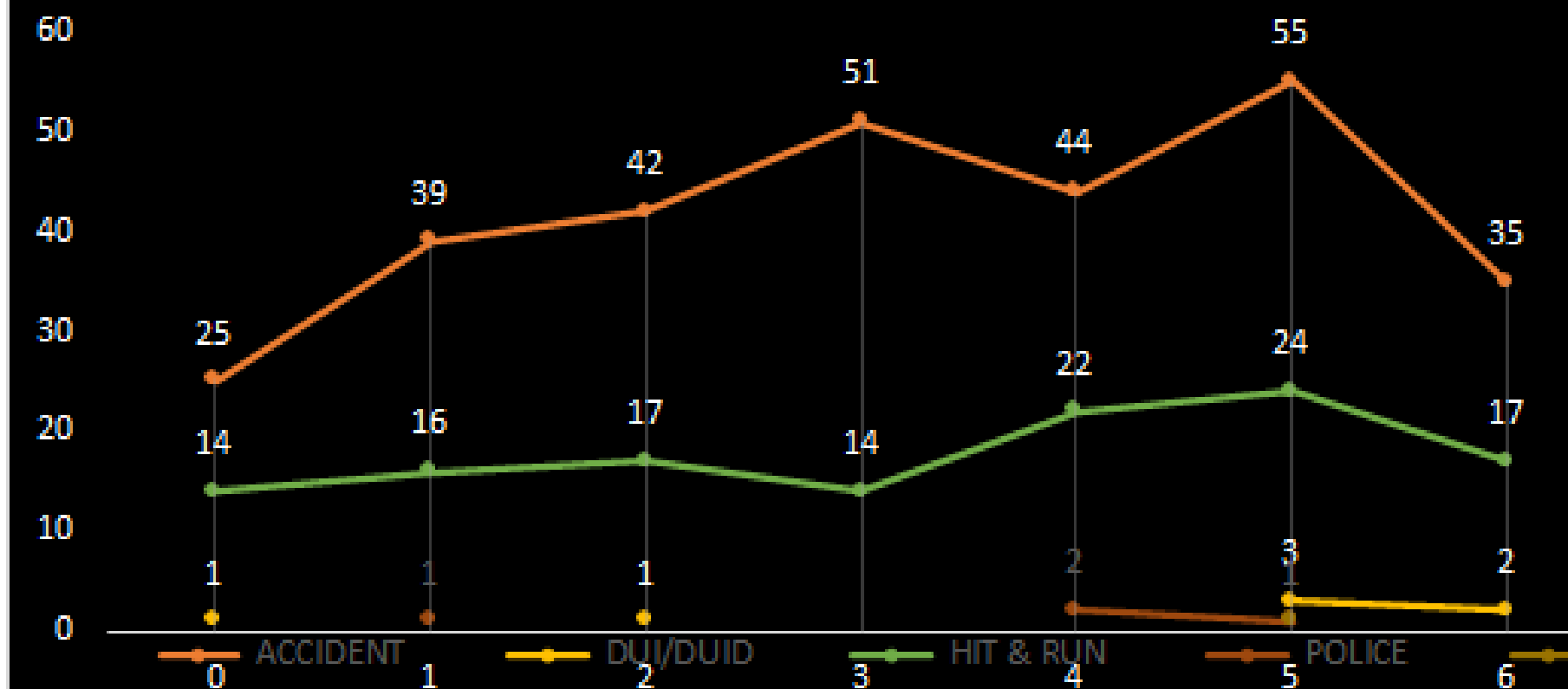
Areas where Police Van involved



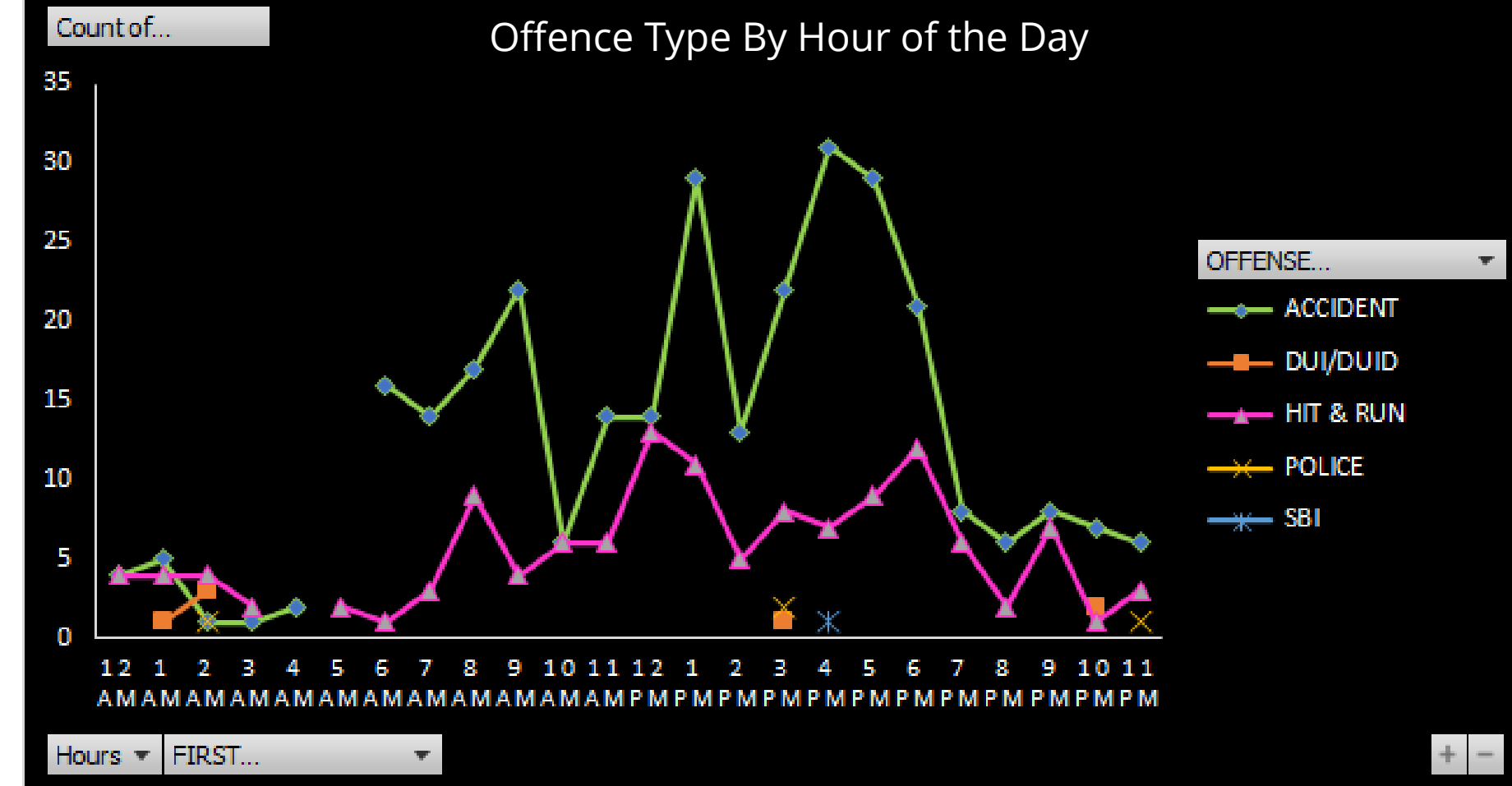
Offence Hot-Spots in Neighbourhood



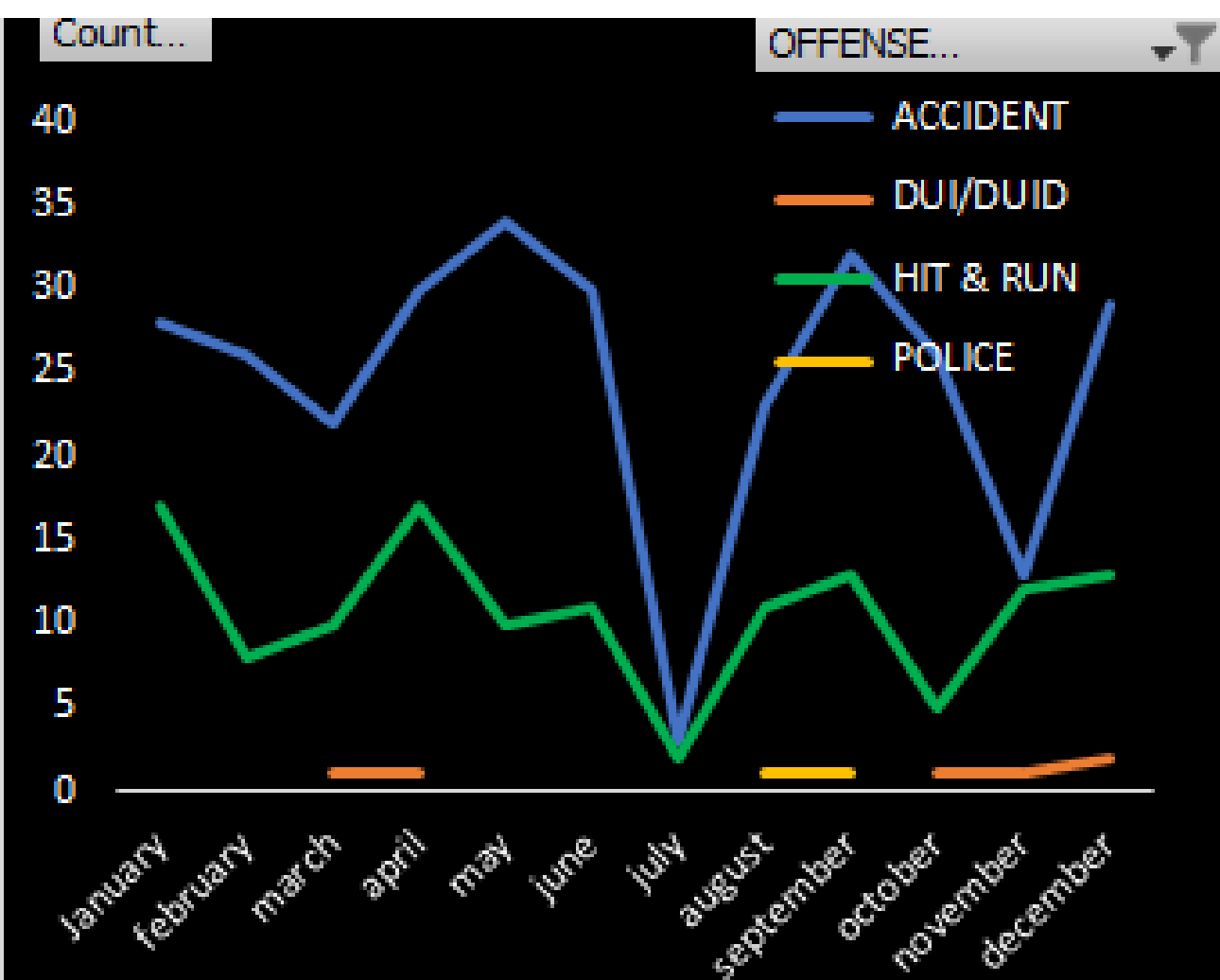
Types of Offence by Weekday



Offence Type By Hour of the Day



Offence Type By Month of the Year



Type of Offences by days of the Month

