



Visualization of Seattle Crime Data



Leaf Map
 Presenting data with each item in a map is a common way to visualize data. It's a good way to show the location of data points and how they relate to each other.



Visualization Design Pattern
 A visualization design pattern is a reusable solution to a common problem in data visualization. It's a way to organize and present data in a consistent and effective way.



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Visualization Elements
 Visualization elements are the individual components that make up a visualization. They include things like axes, labels, titles, and data points.



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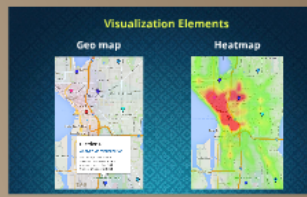
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UI Design Patterns
 UI design patterns are reusable solutions to common problems in user interface design. They help create consistent and effective user experiences.

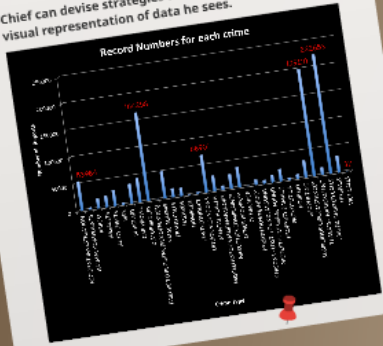


Visualization Elements
 Geo map: A map that shows the location of data points on a geographic grid.
 Heatmap: A map that shows the density of data points in different areas.



Dive down into the depths!

Still, why visualization? Why not just raw data?
Chief can devise strategies to reduce crimes based on the visual representation of data he sees.



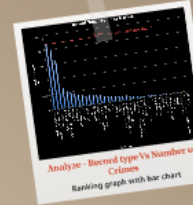
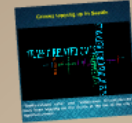
Hmmm... Let me analyze the data!



Comparison of data over the past 5 years is easier with graphs.



April and August did not see any Narcotics complaints in any year (from 2010-2015).



Analys - Record type Vs Number of Crimes
Ranking graph with bar chart



Record Type Vs Number of Crimes with very little or no processing time



Record Type Vs Number of Crimes with very little or no processing time

Conclusion

- Be cautious while driving, in Seattle, especially!
- Be careful while going out for lunch and dinner dates!
- Visualization using bar graph is easier for comparing the crimes that are taken care of and the ones that are neglected.
- Maps visualization allows the SPD authorities to see which areas have lesser attention or which ones have higher crime rates.

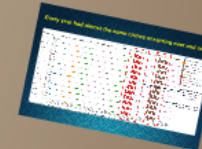
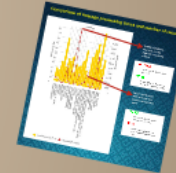
The Story...

Exploration: Seattle Police department and authorities would find this useful to analyze data and plan for faster response to incidents to reduce the crime rate!



SPD in Action!

Dataset used: Seattle Crime Dataset with more than 1million entries.
Used By: SPD (Seattle Police Department)
Crime Occurrence Range: 2010 - 2015



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Going further deep...

Who is the user?

- Seattle police department or related authorities

How did we do this?

- Tableau, High Charts, Infogram, MapReduce (to clean & process the data as well as auto generating the site)

The Killer Dashboard!

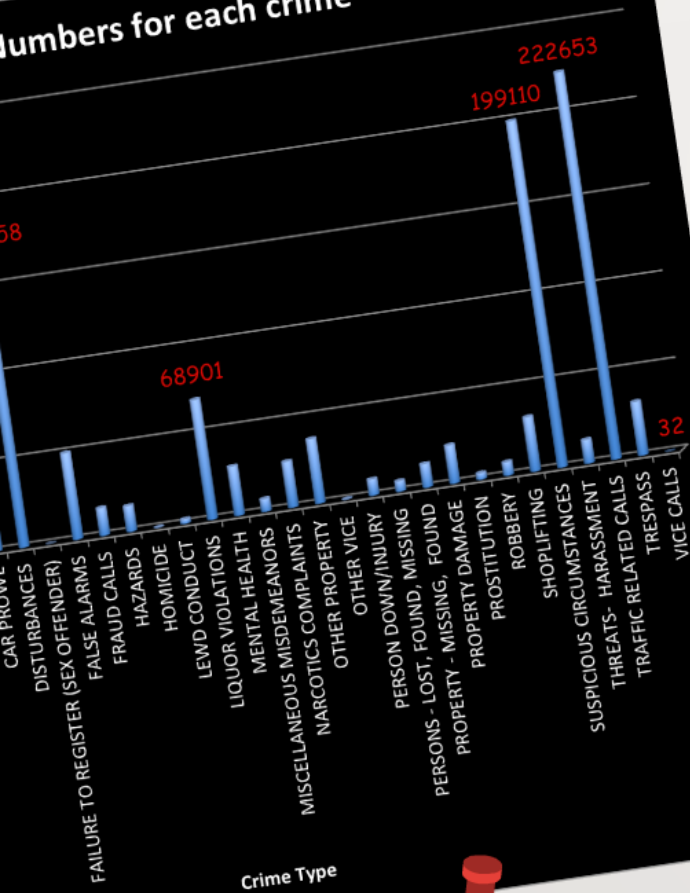
- Visualization that is effective will catch the attention of the chief and shall give SPD a better **insight**.
- With such an interactive design, the crimes that are evident can be quickly attended to.

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oths!

Why not just raw data?

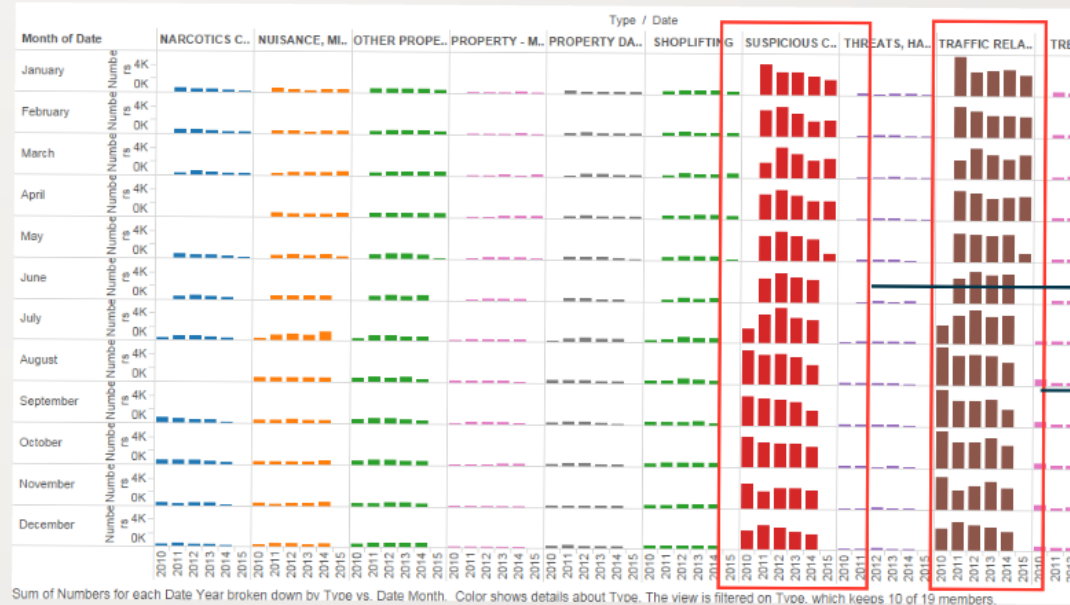
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Numbers for each crime



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Property- missing and found and property
damage are the crimes that are minimal in all
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| Month of Date | Number |
|---------------|--------|
| January | |
| February | |
| March | |
| April | |
| May | |
| June | |
| July | |
| August | |
| September | |
| October | |
| November | |
| December | |

Property damage months

April and complain

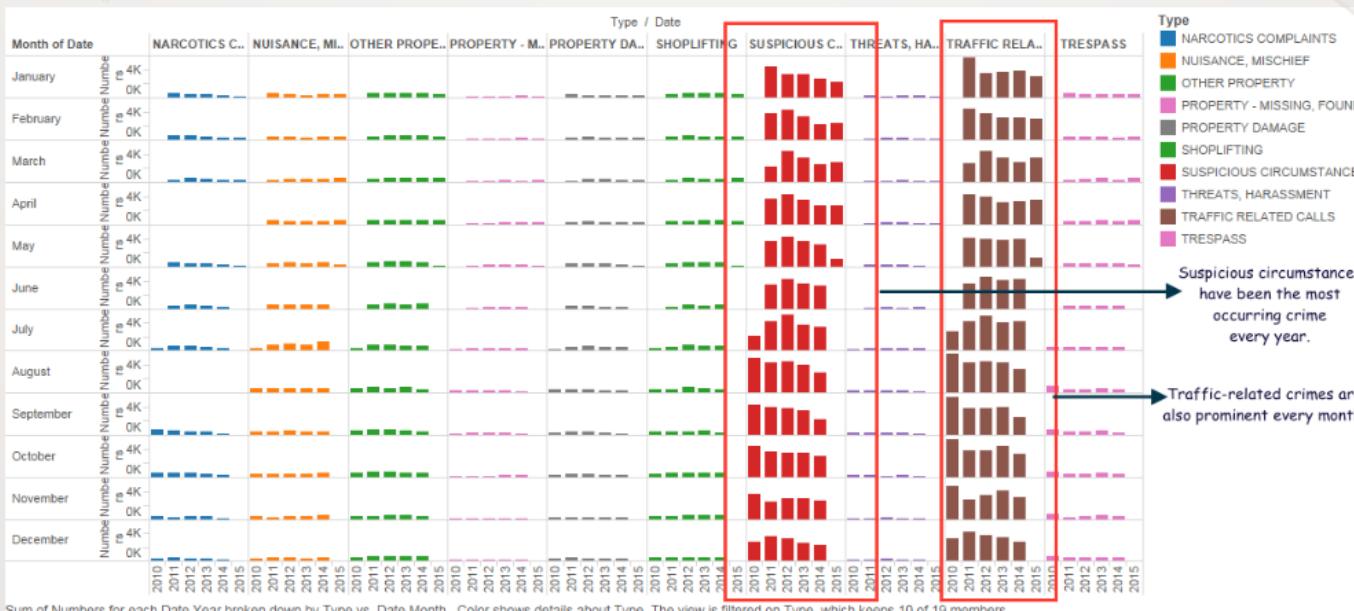




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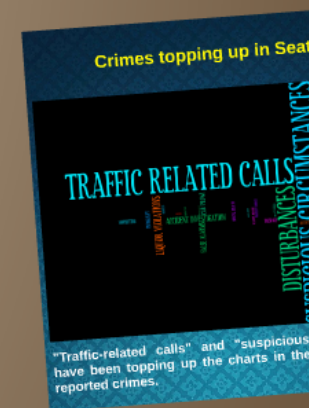


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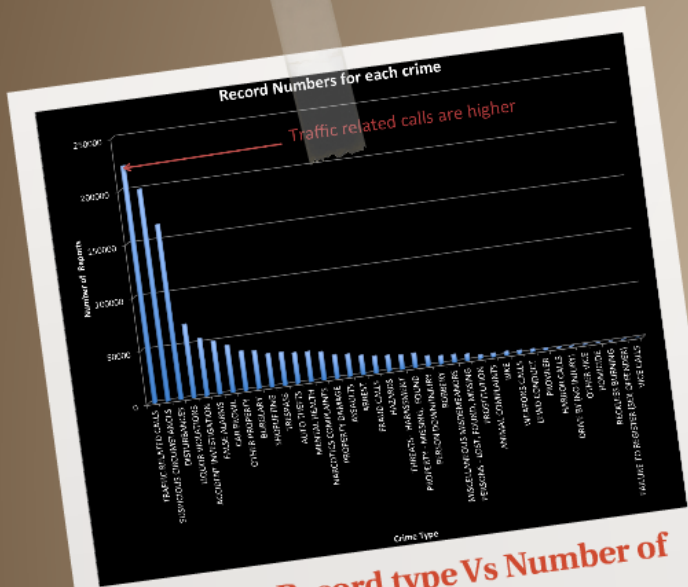
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Crimes topping up in Seattle



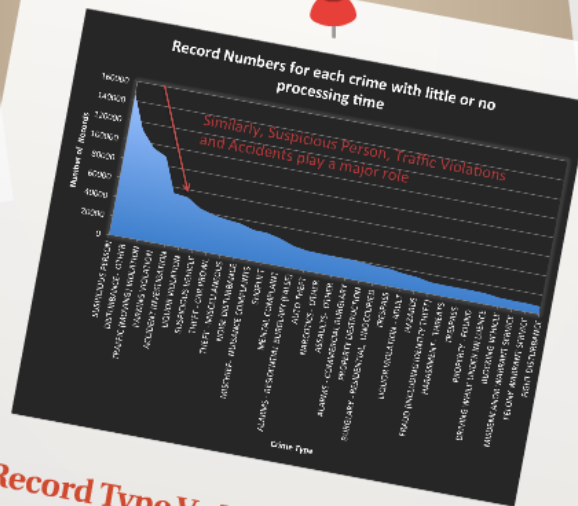
"Traffic-related calls" and "suspicious circumstances" have been topping up the charts in the list of the city's reported crimes.



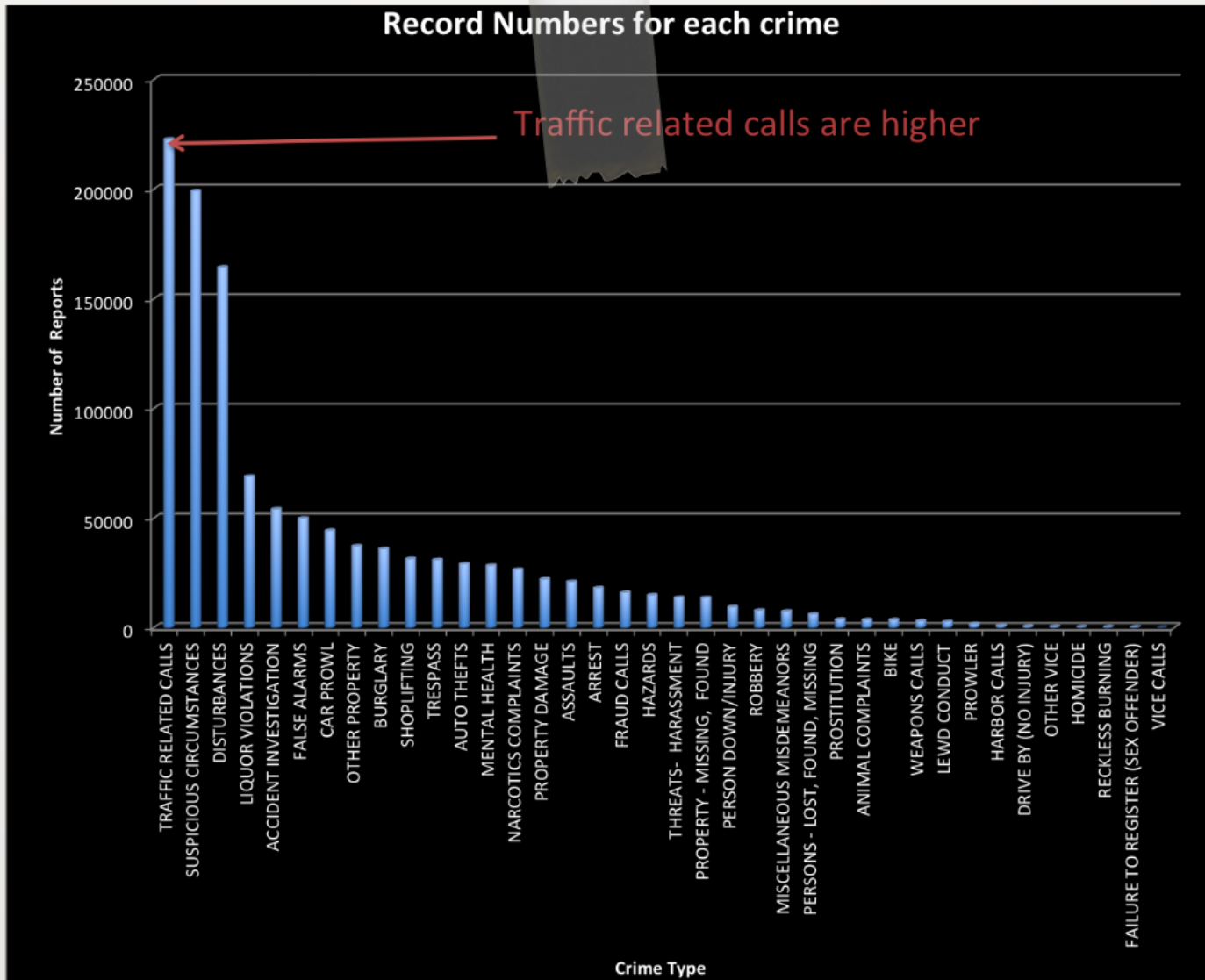
Analyze - Record type Vs Number of Crimes
Ranking graph with bar chart



Record Type Vs Number of Crimes - with very little or no processing time!

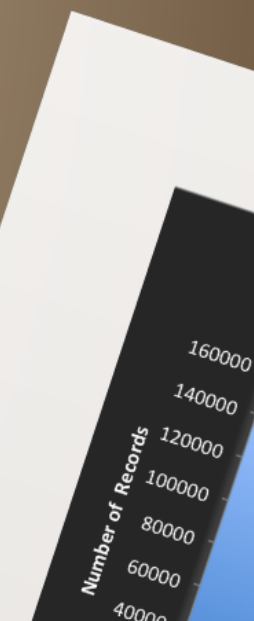


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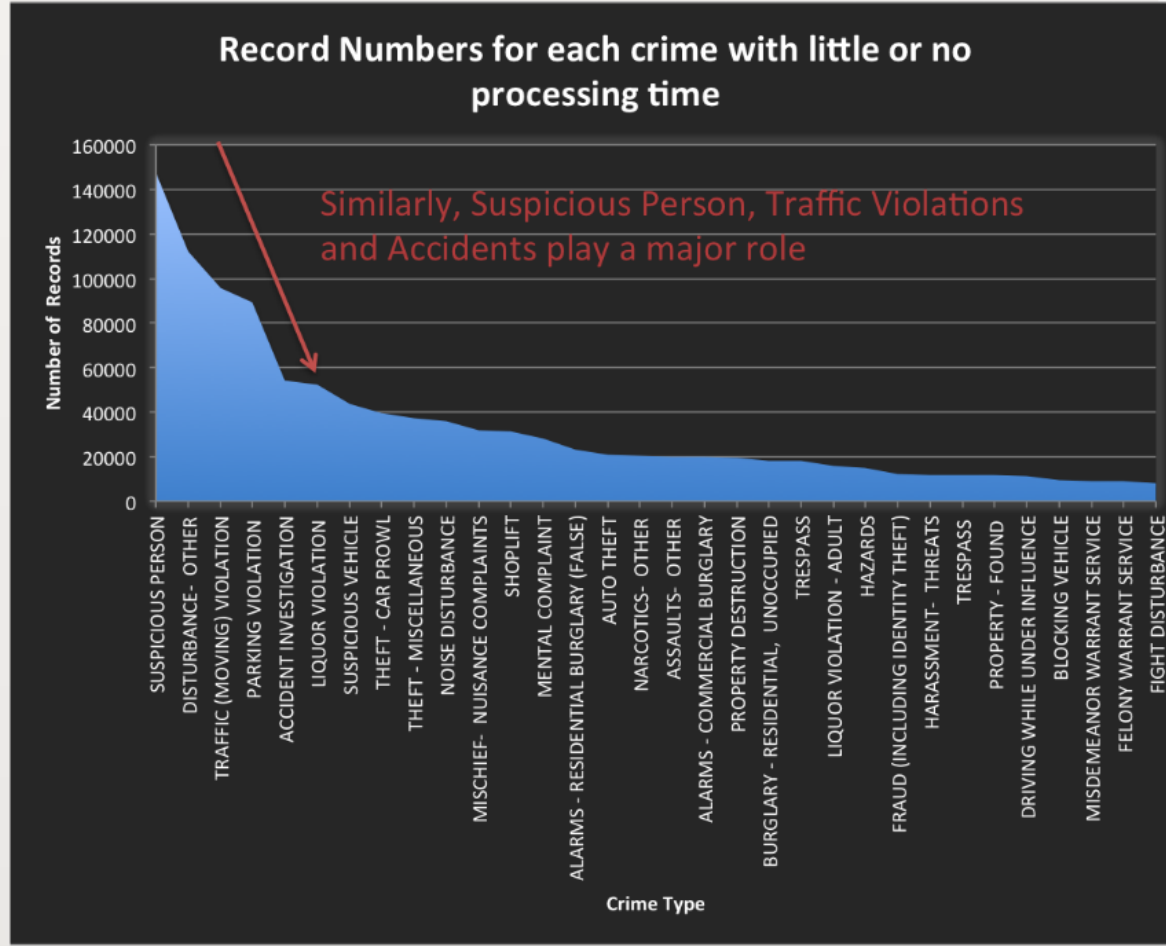
Ranking graph with bar chart



RESEARCHER
VICE
FAILURE TO REGISTER (SEX OFFENSE)

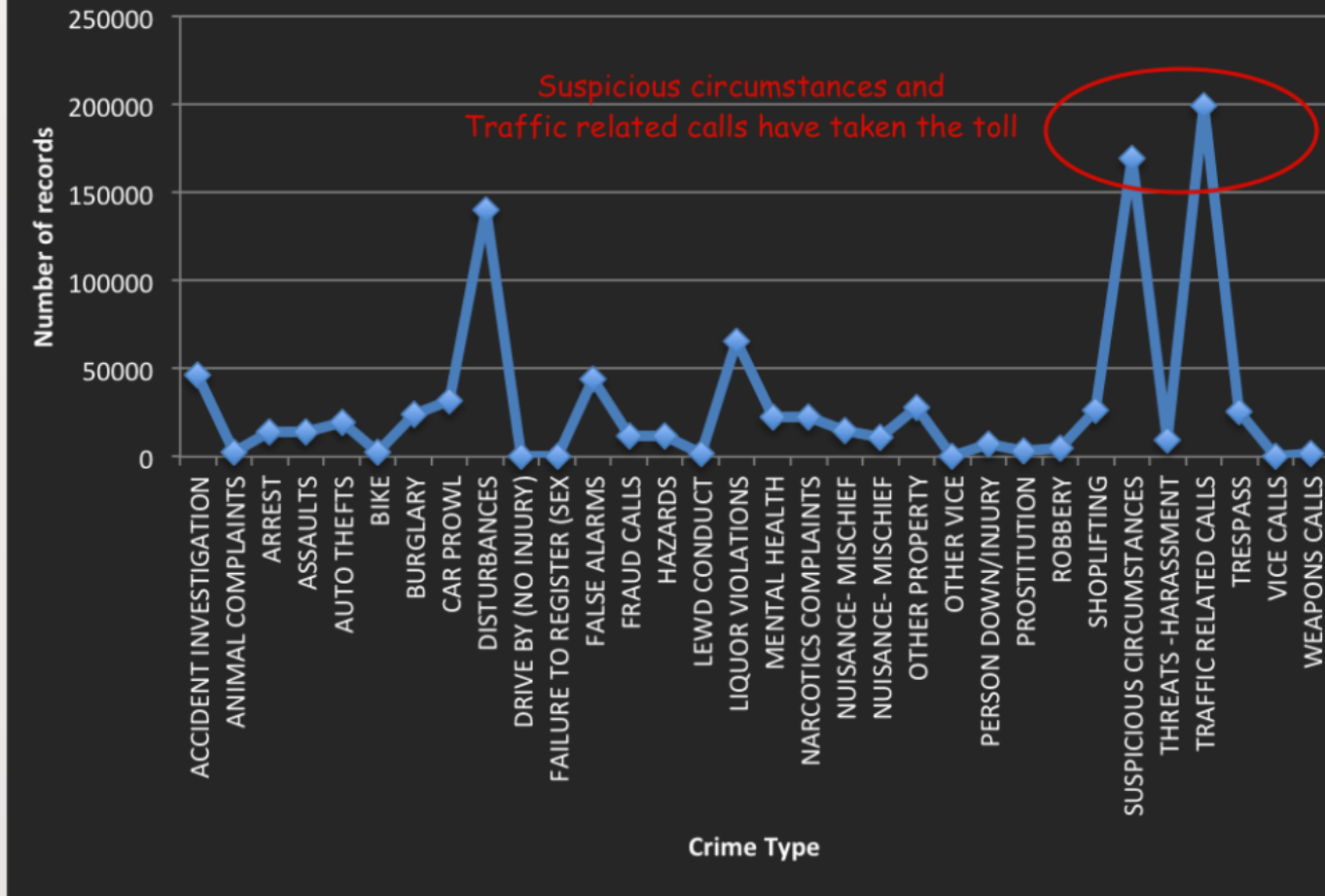
Number of

Chart



**Record Type Vs Number of Crimes -
with very little or no processing
time!**

Record numbers for each crime with little or no processing time



**Record Type Vs Number of Crimes -
with very little or no processing
time!**

But wait!! Let's not jump into conclusions!

- This city really cares about Homicides!
- These kind of crimes have quicker process times.
- But the number of reported incidents are less - an irony?
- No such homicide crimes occurring often? Or is it because of the impact it makes on people?

Processing Times - Which one is Faster?

- Homicides gain faster attention than the rest.
- False alarms are the least ones attended to.
- Vessel Recovery at the harbor and Narcotics are the other important crimes with faster attention rate.



Crimes that are high this year

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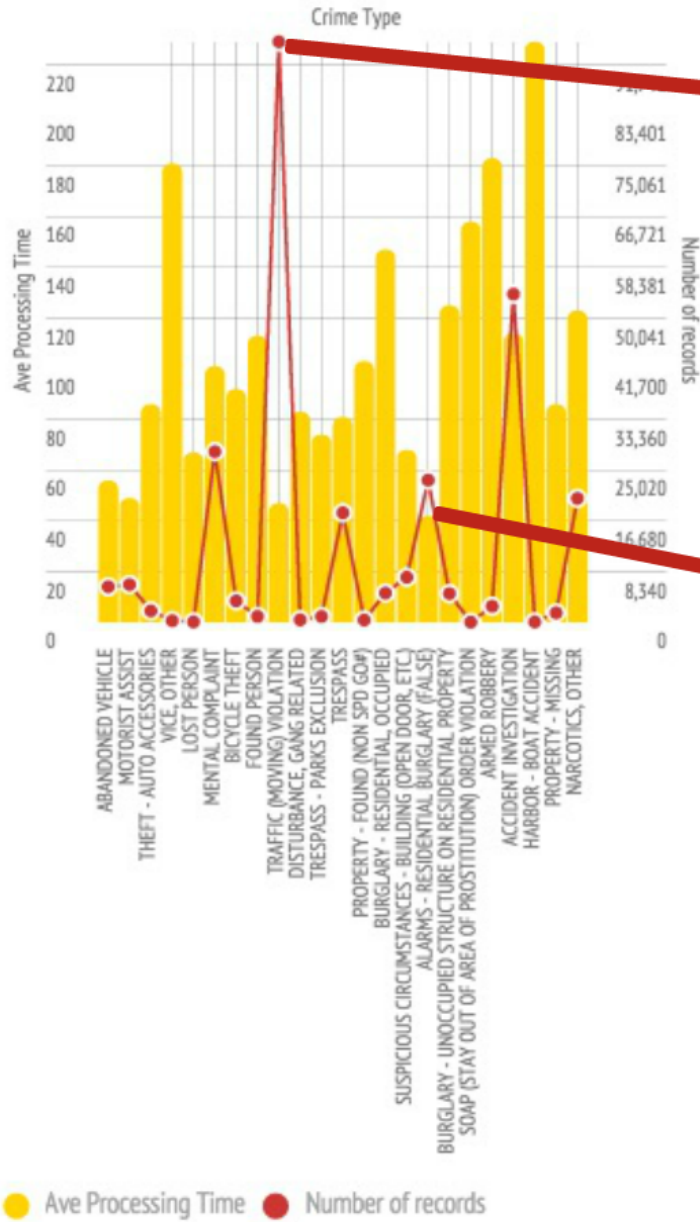
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Comparison of Average processing times and number of records



Traffic violations seem to be the highest occurring crimes

▲ 95494

Number of Traffic Violation crimes - Red alert!!!

▼ 24

(Number of) Stay out of prostitution order violation - is a reduced number!

False residential alarms have the lowest processing time

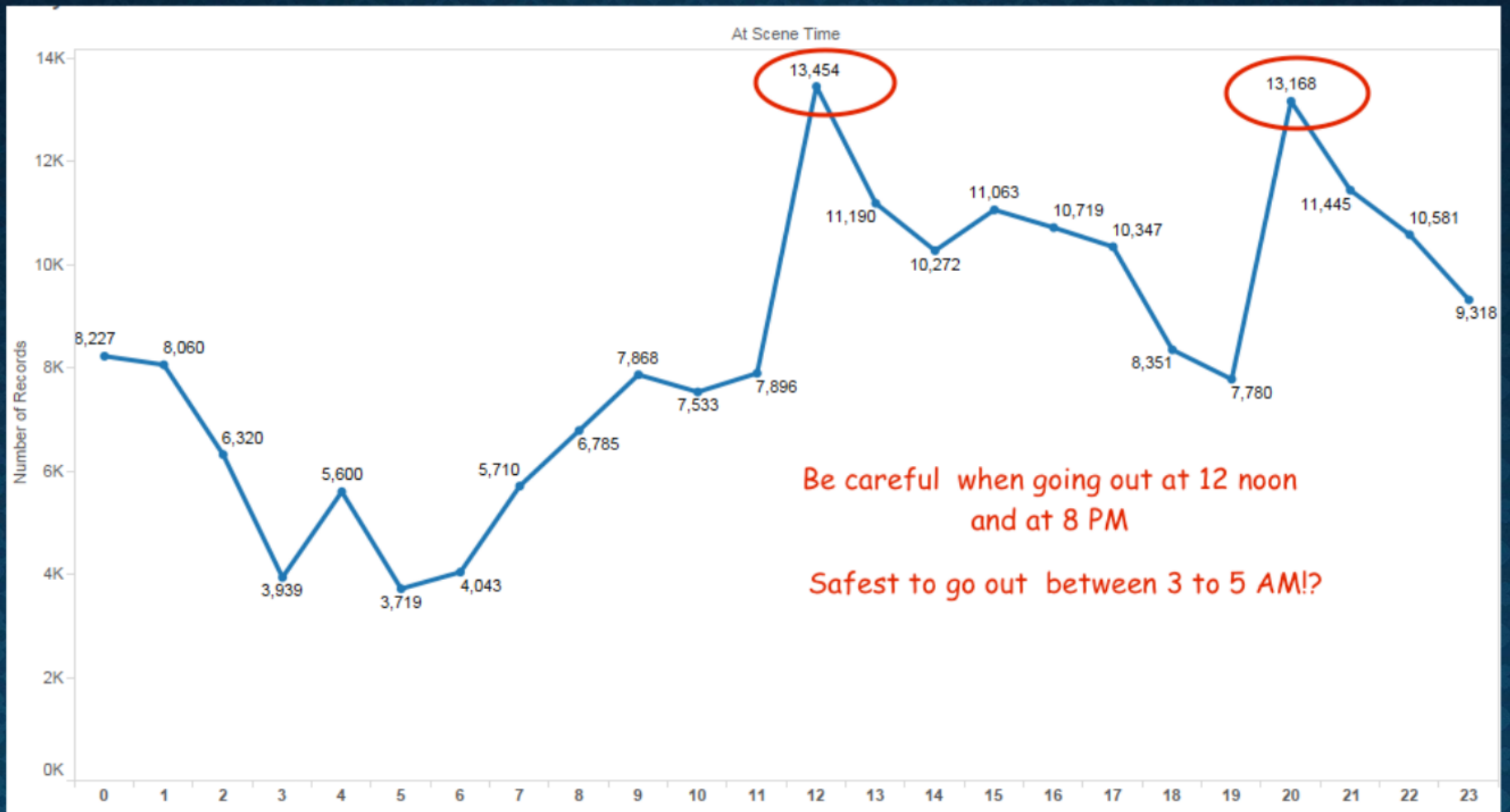
▲ 224

Average processing time for harbor boat accident is the highest

▼ 42

Average processing time for false alarms in residential burglary is the lowest

Risky Hours



Crimes that are high this year(2015)...



A word cloud visualization showing various crime categories. The most prominent words are 'DISTURBANCES' (large, yellow), 'TRAFFIC RELATED CALLS' (large, red), and 'SUSPICIOUS CIRCUMSTANCES' (large, yellow). Other visible words include 'LIQUOR VIOLATIONS', 'NUISANCE, MISCHIEF', 'CAR PROWL', 'TRESPASS', 'BURGLARY', 'FALSE ALARMS', 'SHOPLIFTING', 'OTHER PROPERTY', 'MARTINIS COMPLAINTS', and 'MOTOR VEHICLE'. The words are arranged in a horizontal, somewhat overlapping manner.

The same as previous years?!

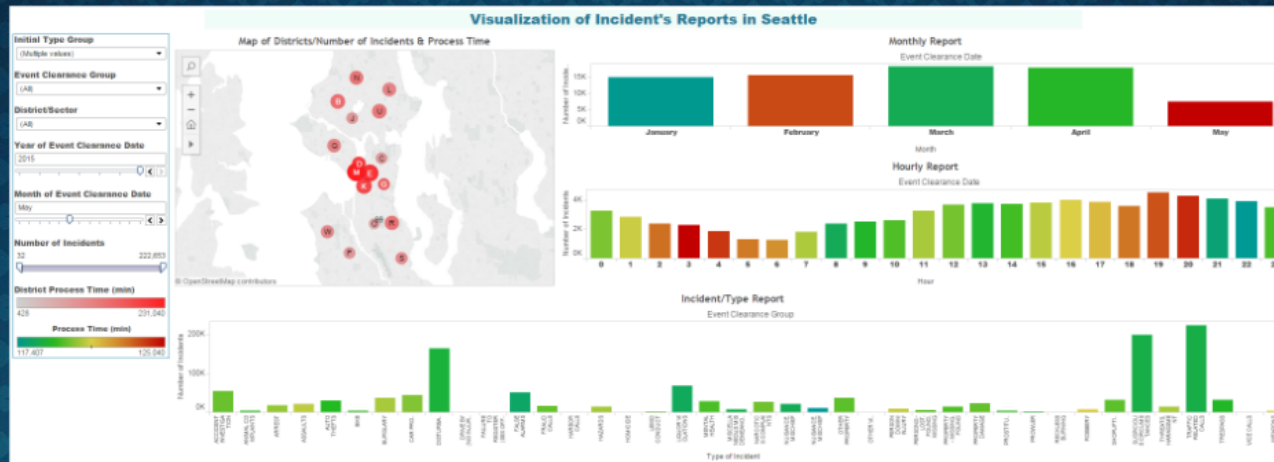
Let's Help SPD

- Apparently SPD really needs help in finding problems.
- With few simple graphs we find some issues.
- Let's give them a powerful tool for analyzing their data.

UI Design Patterns

Organization

- Dashboard



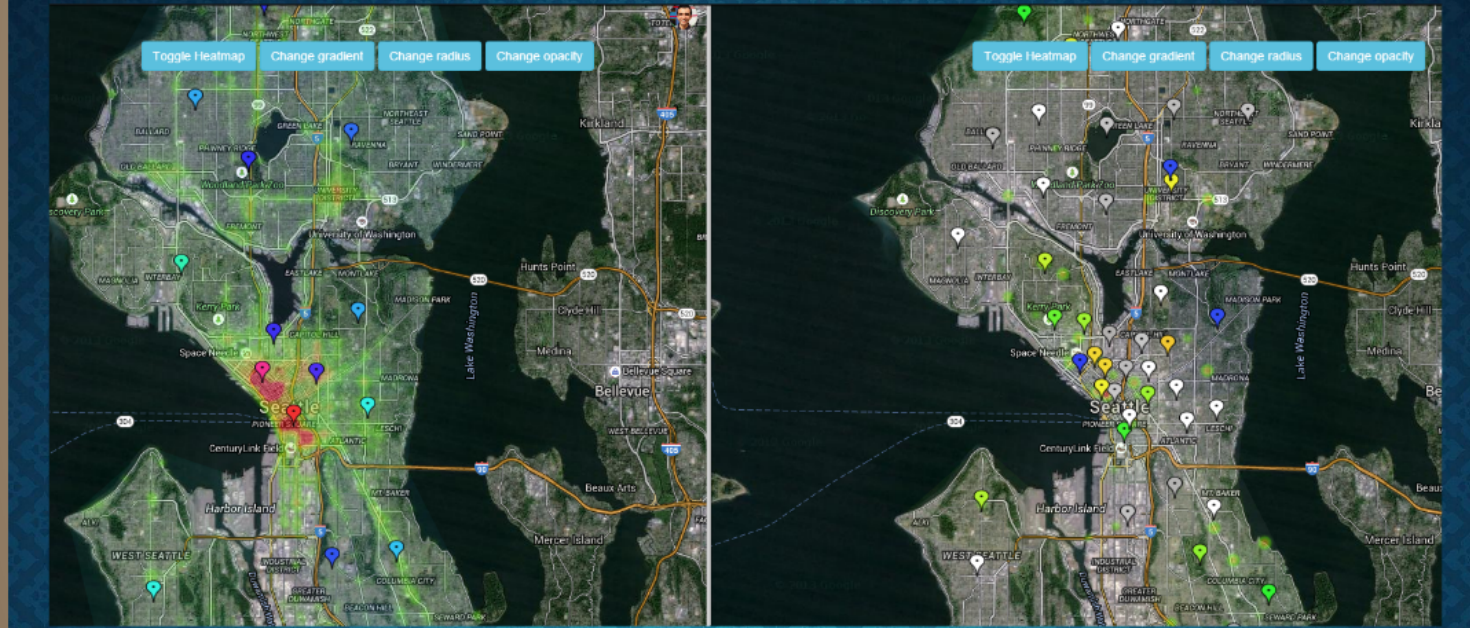
- Settings editor - options to customize the map



UI Design Pattern

Organization

- Multiply workspace



UI Design Patterns

Layout

- Visual framework
- Tiled section
- Collapsible panel
- Self-adjusting layout

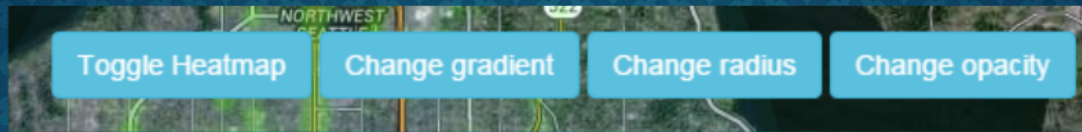
Navigation

- Hub & spoke
- Sequential
- Pyramid

UI design Patterns

Action

- Button groups

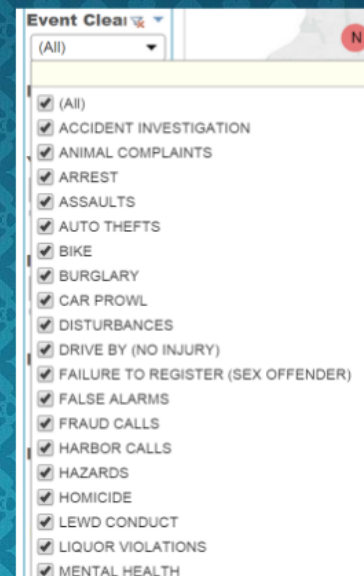
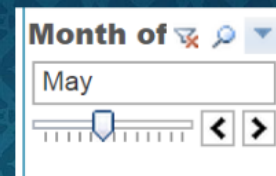


- Hover tools

UI design Patterns

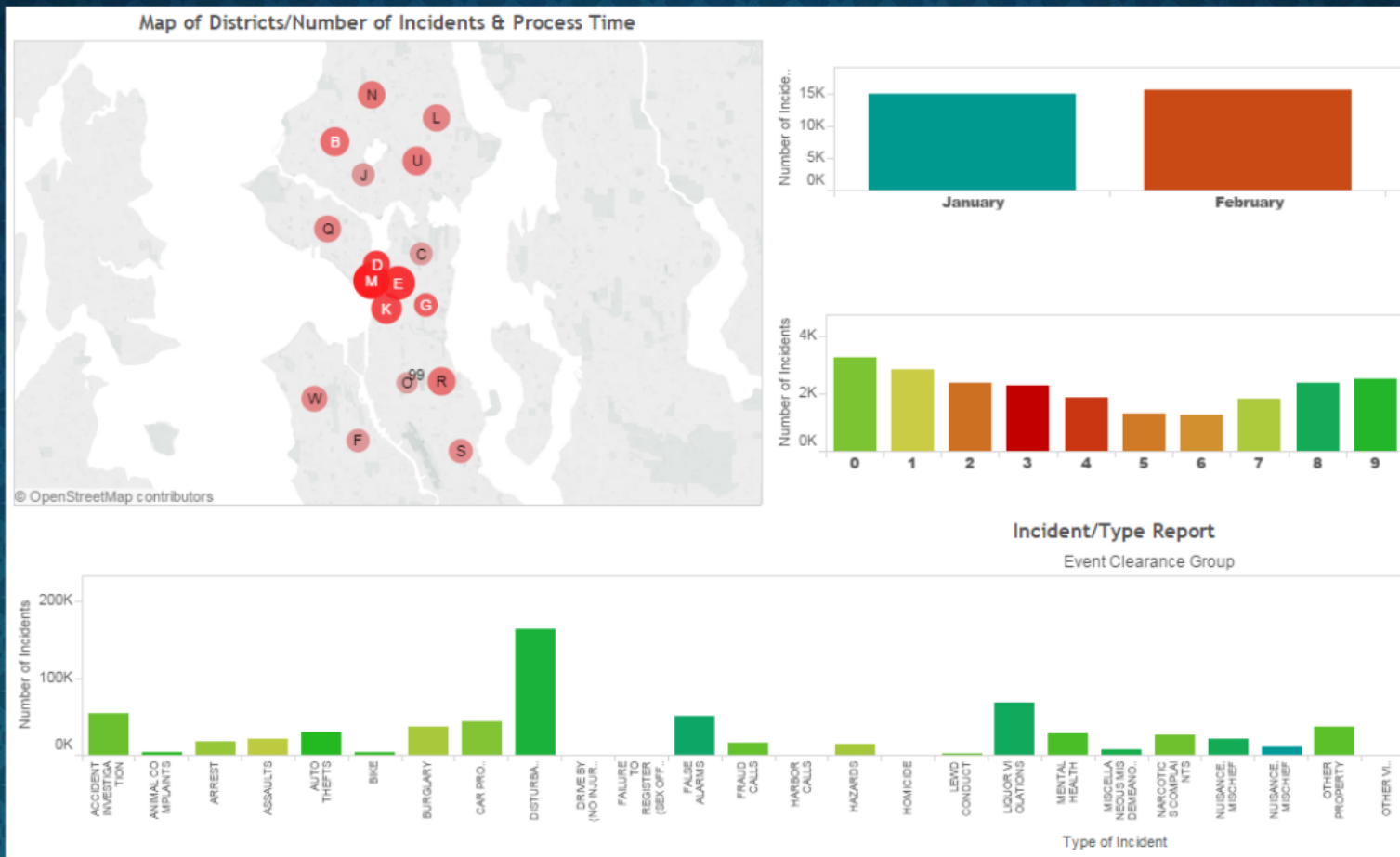
Choice control

- Slider
- Dropdown list
- Checkbox list



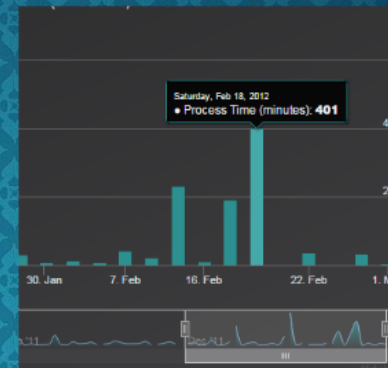
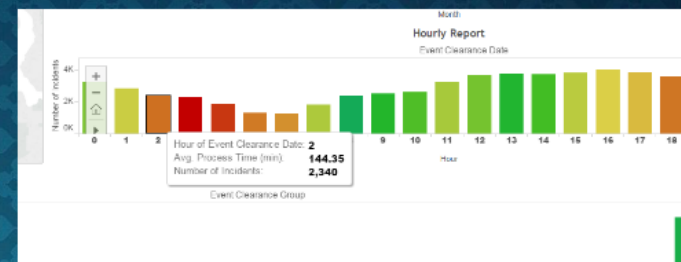
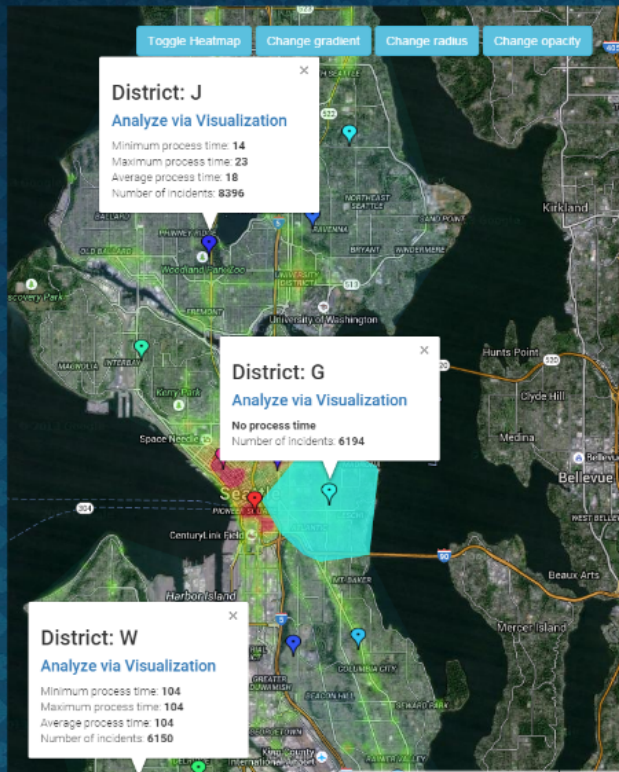
Visualization Design Pattern

Overview plus details



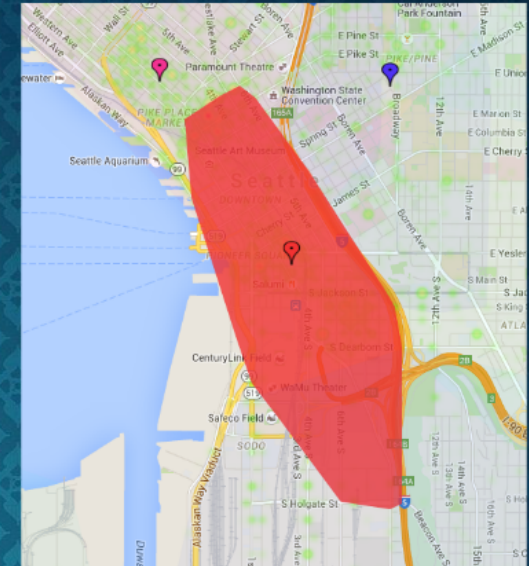
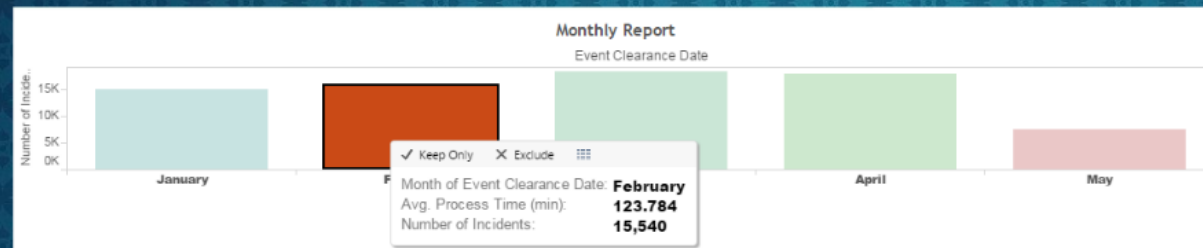
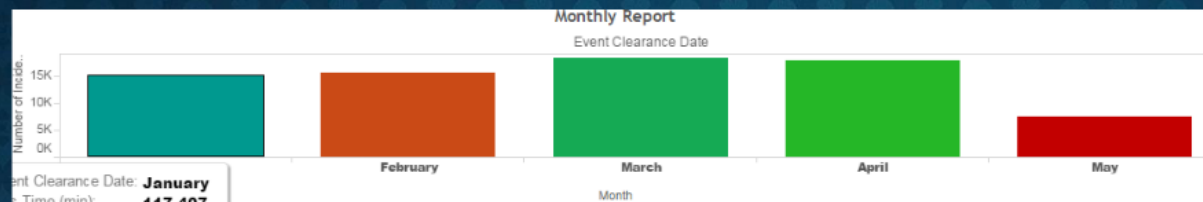
Visualization Design Pattern

Data tips



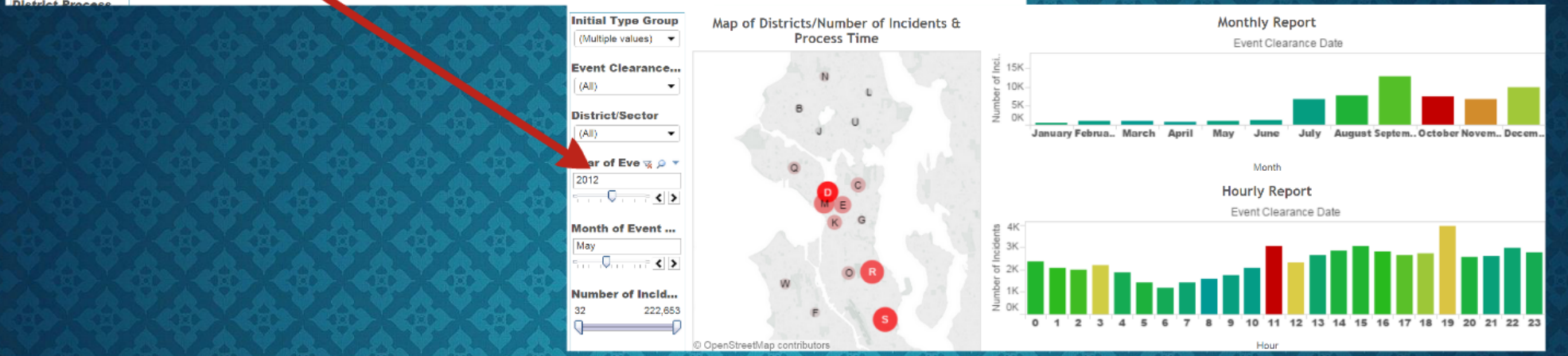
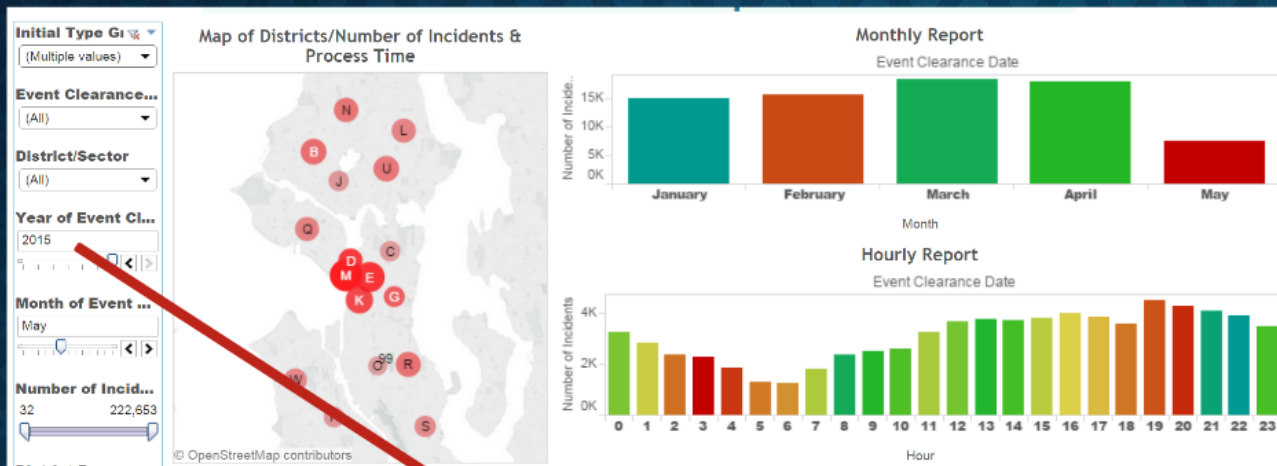
Visualization Design Pattern

Data spotlight



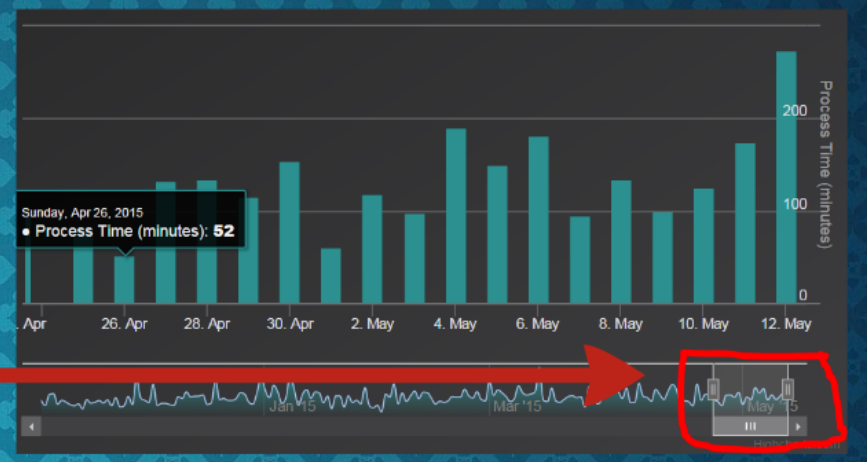
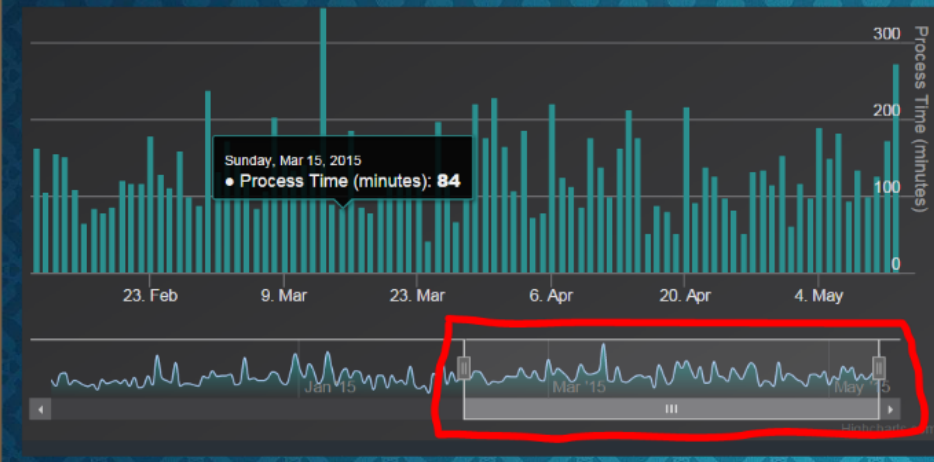
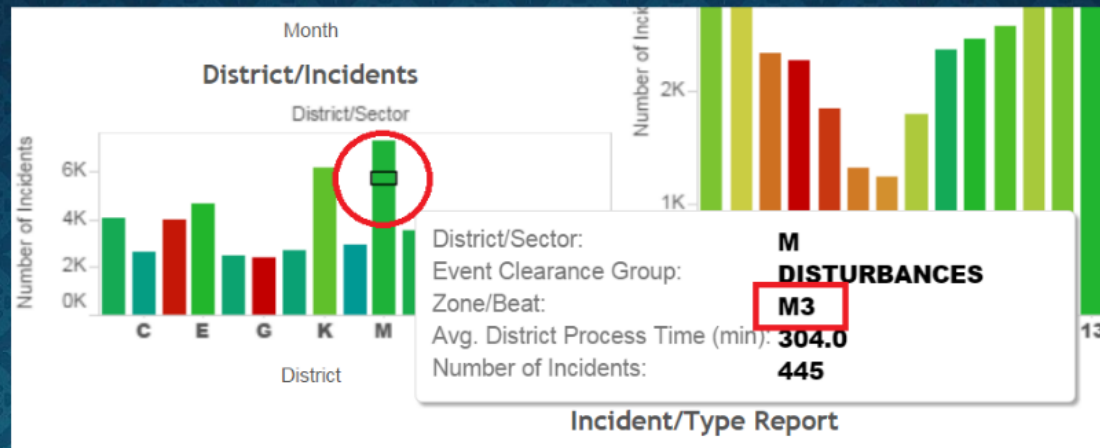
Visualization Design Pattern

Dynamic query



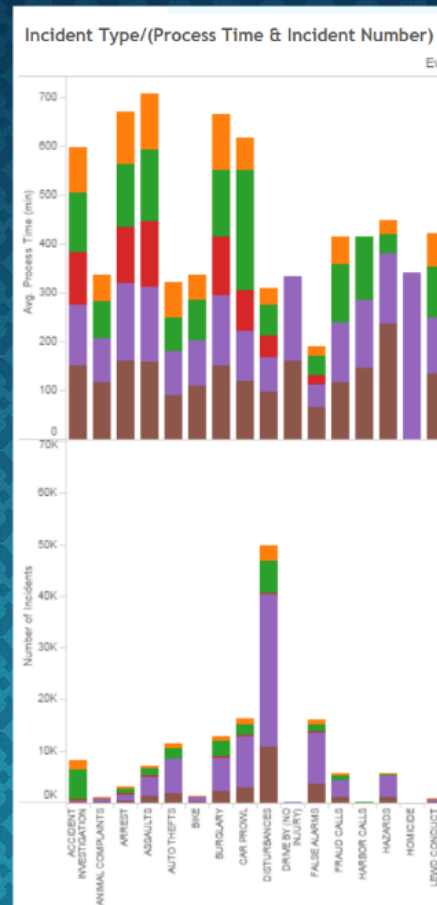
Visualization Design Pattern

Local zooming



Visualization Design Pattern

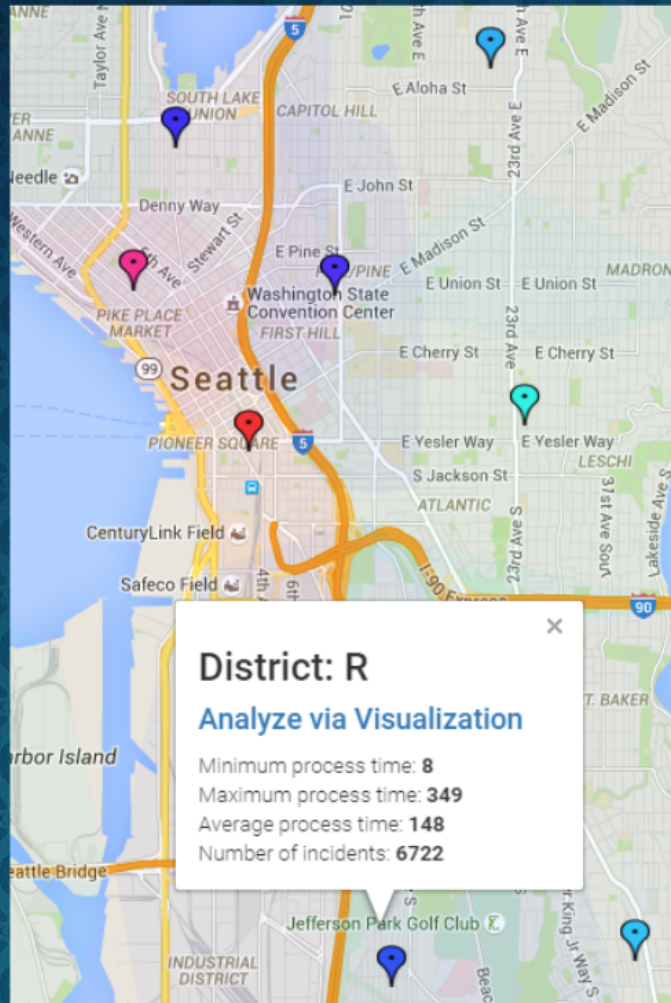
Multi-Y Graph



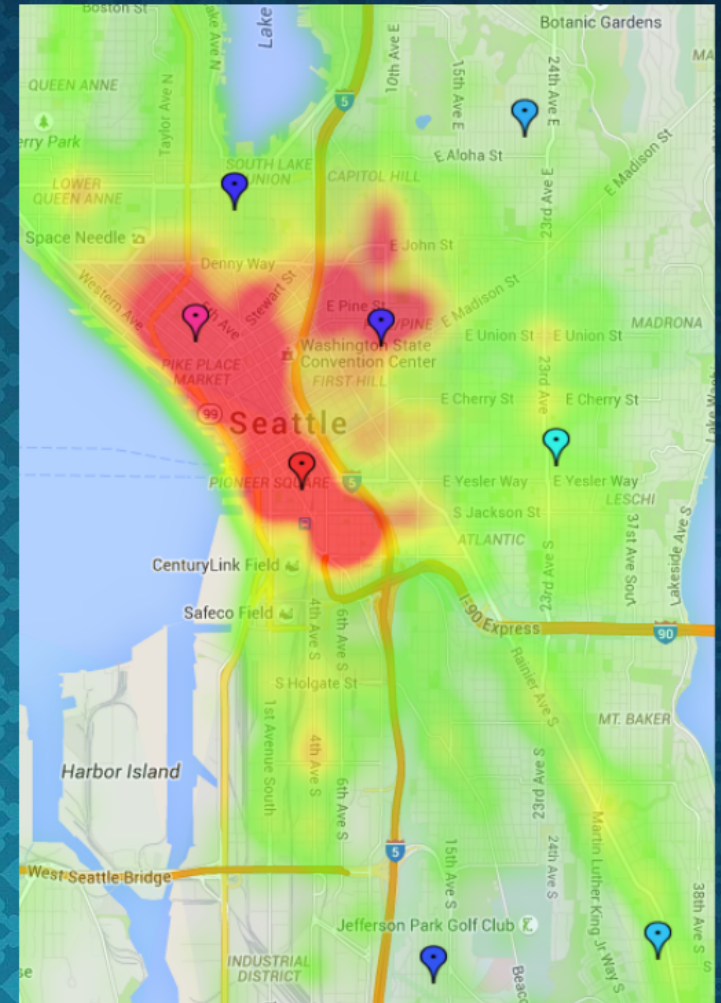
we want to compare the number of incidents

Visualization Elements

Geo map

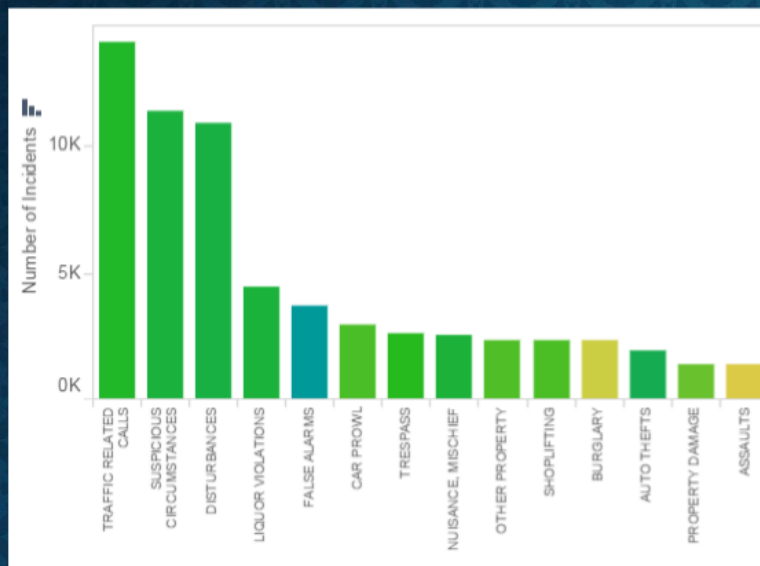


Heatmap

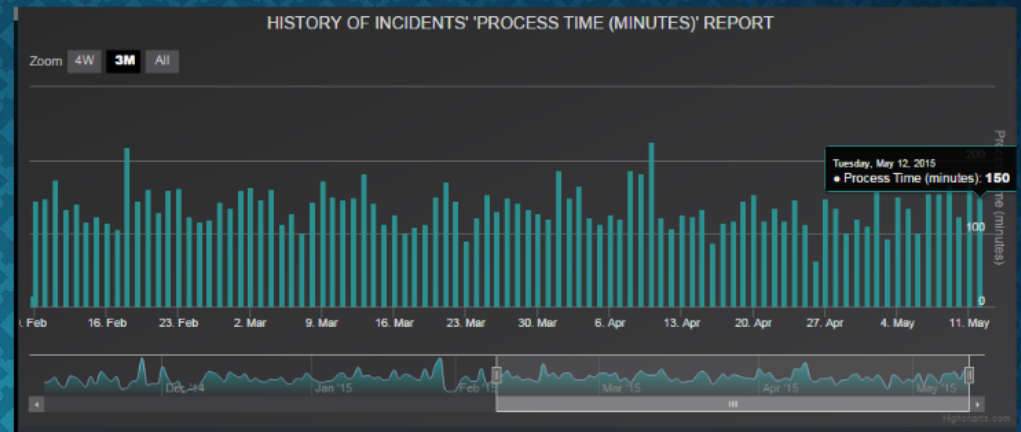


Visualization Elements

Bar graphs



Compare number of incidents

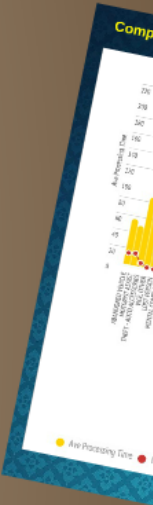


Real-time data with history of 6 months for better comparison

Conclusion

- Be cautious while driving, in Seattle, especially!
- Be careful while going out for lunch and dinner dates!
- Visualization using bar graph is easier for comparing the crimes that are taken care of and the ones that are neglected.
- Maps visualization allows the SPD authorities to see which areas have lesser attention or which ones have higher crime rates.

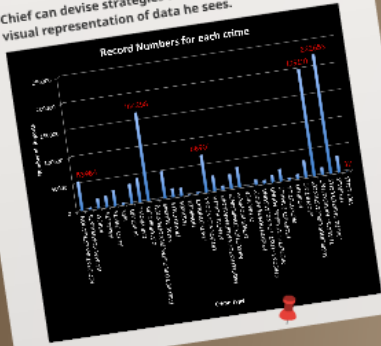
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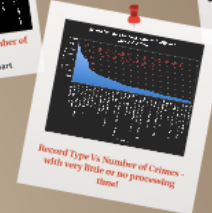
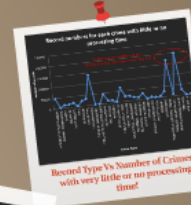
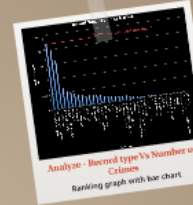
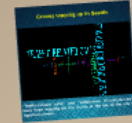


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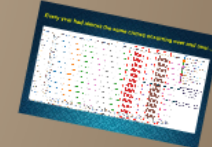
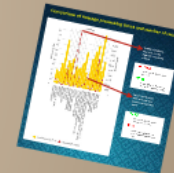
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