Utilizing Microsoft Power BI for Case Work, Task Forces, and Organized Crime Investigations

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NY NJ HIDTA

Background

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

- Historical Geography and GIS
- Bias / Discrimination Research

- GIS Administration
- Power BI Development

ESRI application and Power BI development for task forces and criminal intelligence

What is Power BI?

Versatile

- Scalable: From cleaning files locally to supporting a Department with a 30 page report
- No Coding vs Utilizing DAX, Python, and R
- Customizable canvas
- Designed for a variety of skill levels
- Automating tasks and reports, as well as continuous montioring of trends
- Doesn't have to be limited to visualziation
- Refresh on demand vs Direct Query
- Various means of setting permissions
- Link to internal systems, Cloud Systems, photo managers

Reliable and Evolving

- Continuous opportunities to grow and train
- Easy to copy, version, restore, and transfer
- Receives monthly updates
- Large pool of training resources and user communities

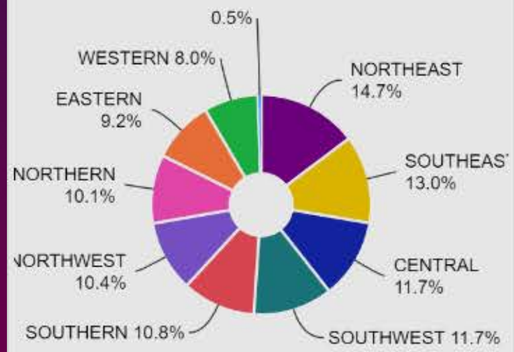
BPD Part 1 Victim Based Crime

To Visit Open Baltimore Click Here

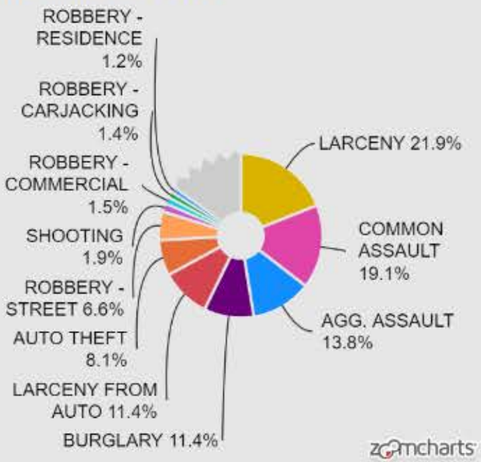
Reset

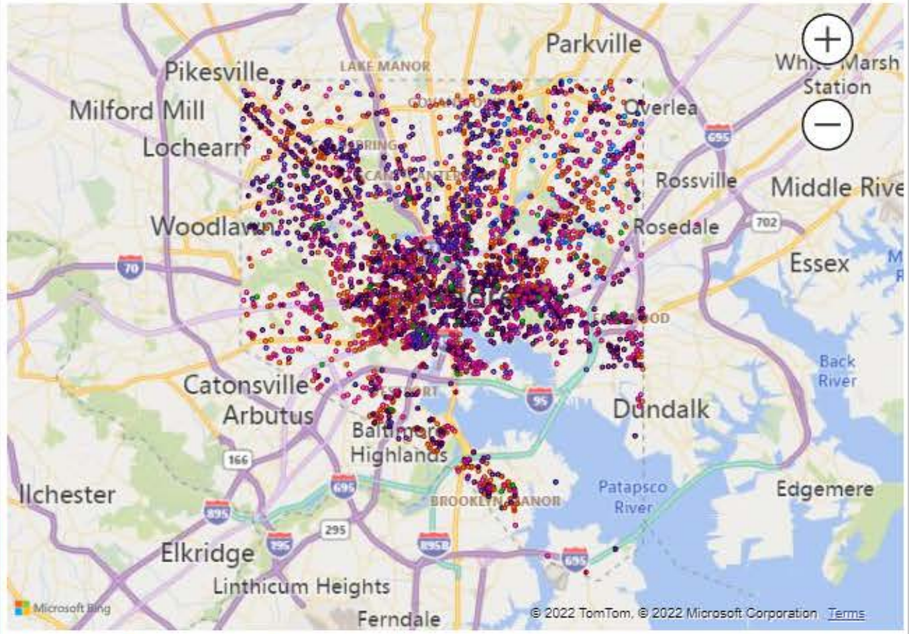
City of BALTIMORE Maryland

Count of Total Incidents by District



Total Incidents by Type





Description AGG. ASS... AUTO THEFT BURGLARY COMM... LARCENY LARCENY ...

Crimedate

5/20/2019 — 12/26/2020

65.00K

Total Incidents

District

- (Blank)
- CENTRAL
- EASTERN
- NORTHEAST
- NORTHERN
- NORTHWEST
- SOUTHEAST
- SOUTHERN

Neighborhood

- Select all
- (Blank)
- ABELL
- ALLENDALE
- ARCADIA
- ARLINGTON
- ARMISTEAD GARDE...
- ASHBURTON

Weapon

- Select all
- FIRE
- FIREARM
- HANDS
- KNIFE
- NA
- OTHER

Description

- Select all
- AGG. ASSAULT
- ARSON
- AUTO THEFT
- BURGLARY
- COMMON ASSAULT
- HOMICIDE
- LARCENY

Crimecode	Year	Month	Description	District	Premise	VRI_Name	We
9S	2019	May	SHOOTING	CENTRAL	STREET		FIR
9S	2019	May	SHOOTING	EASTERN	STREET		FIR
9S	2019	May	SHOOTING	EASTERN	STREET	Eastern 1	FIR
9S	2019	May	SHOOTING	NORTHEAST	STREET		FIR
9S	2019	May	SHOOTING	NORTHERN	ALLEY		FIR
9S	2019	May	SHOOTING	NORTHERN	STREET		FIR

NYPD Force Dashboard

Wednesday, January 01, 2020
Starting Date

Thursday, June 30, 2022
Ending Date

Select all | Jan 20 | Feb 20 | Mar 20 | Apr 20 | May 20 | Jun 20 | Jul 20 | Aug 20 | Sep 20 | Oct 20 | Nov 20 | Dec 20

17,740 Incidents

41,681 Members of Service

17,514 Subjects

Background Statistics

16,237,072
Overall 911 Calls

415,957
911 Calls - Person in Crisis

183,073
911 Calls - Weapon Involved

389,170
Overall Arrests

58,161
Arrests - Weapon Possessed

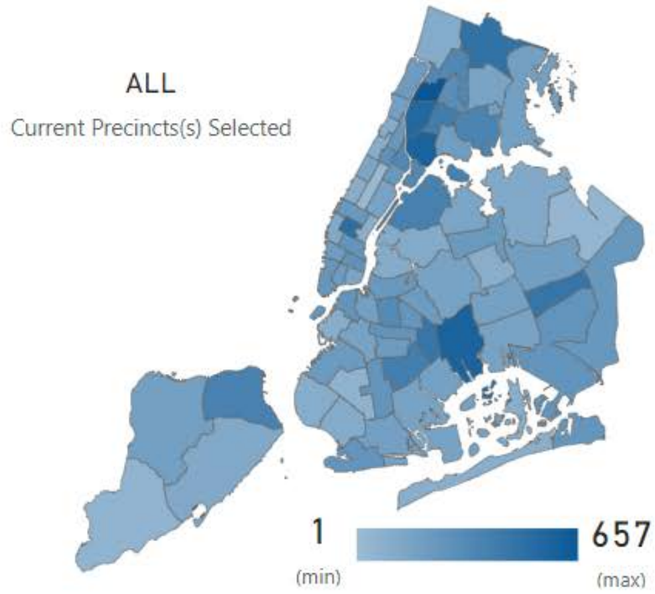
Data last refreshed on...
7/11/2022 10:40:29 AM

Data are available for download at the NYC OpenData site.

Incidents by Month

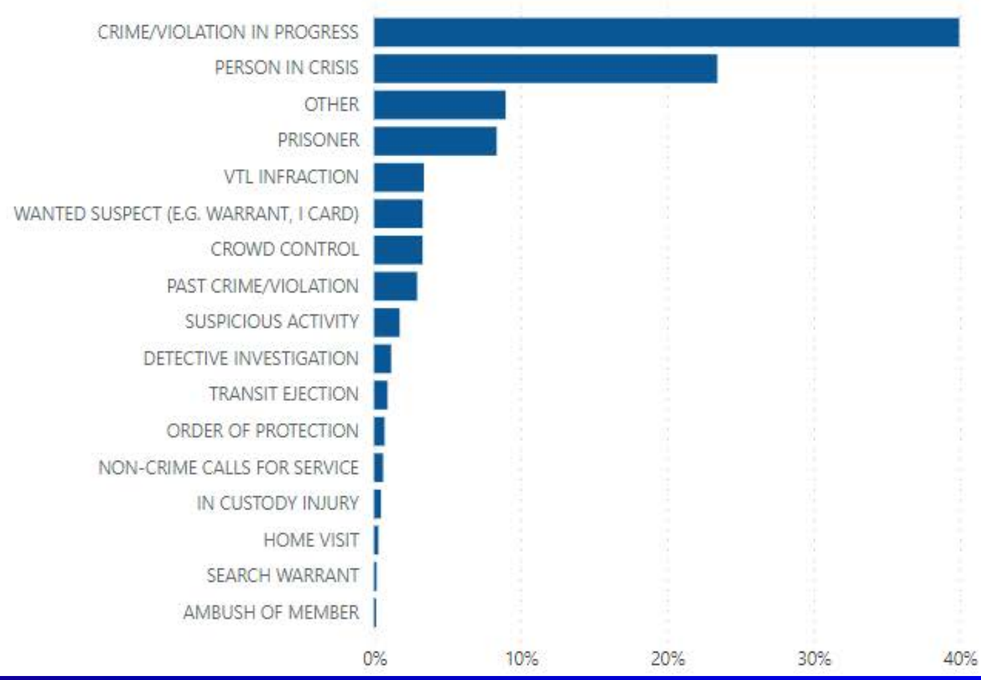
Type of Force

Count of Force Incidents by Precinct*



* Precincts shaded in gray have zero incidents

Basis for Encounter



Ethical Considerations

- Database creation and criminal group association
- Predictive algorithms vs optimizing analysis
- Educating your users about inferences or limitations of the data (add text boxes)

Applied Uses

The Full Picture

Power BI is designed to handle large volumes of data, allowing creators to import entire criminal histories for sets of subjects without experiencing lag. Users then have the option of focusing on recent events (Year to Date Initial View) or evaluating all available data.

Monitoring

Filters remain in-place after exiting, allowing users to focus on data just for subjects they're responsible for. This helps eliminate issues caused by perps being arrested outside an area of resposibility or if there's a failure to notify. It also saves time and energy.

Alerting

Depending on licensing and user roles, automated alerts can be established based on custom rules (e.g. a crime spike or increase in a particular criminal group's activity)

Meeting Ground for Collaboration

"Potluck" of data

Work with DA Offices to version a product and filter out data to avoid discovery issues

Every visual and page can have unique and precise filters

Controlled access to a limited pool of data can help mitigate IT Security concerns

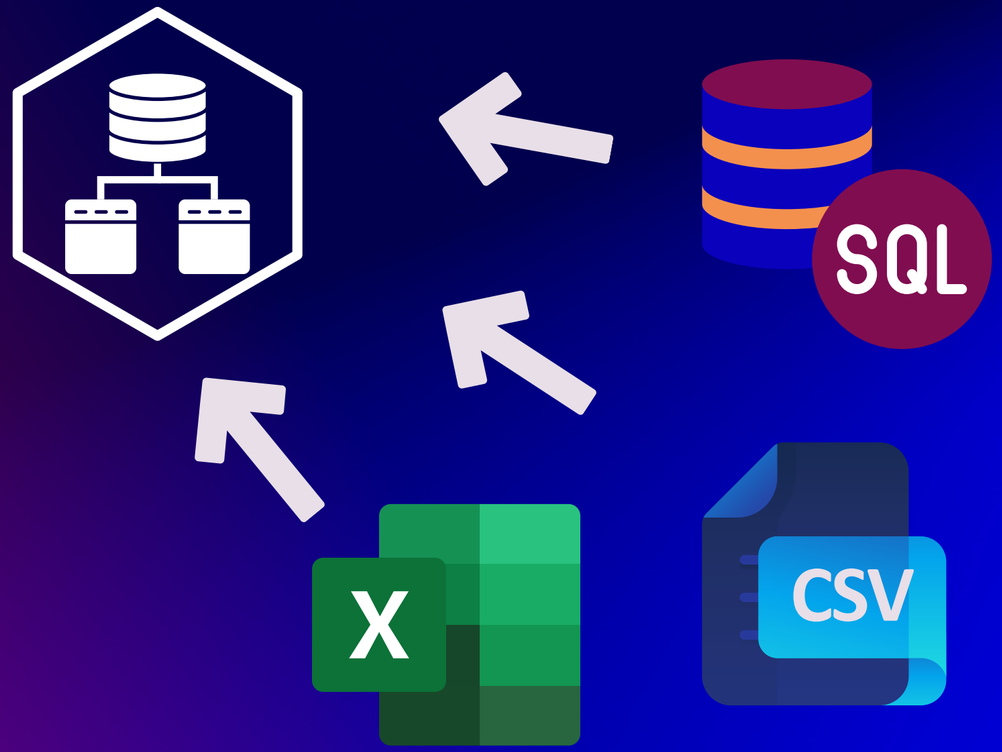
Navigate interagency account creation issues

"Frankenstein's Monster"

Not just a meeting ground of agencies, but of data

Different file types and refresh rates

Where data from disparate parts of a warehouse can be joined



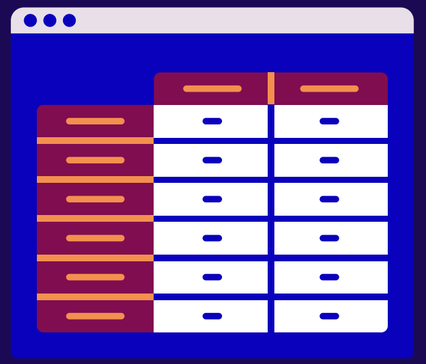
One to Many / One Directional Relationships

Master Table

Complaints

Court History

Incarceration / Parole / Probation

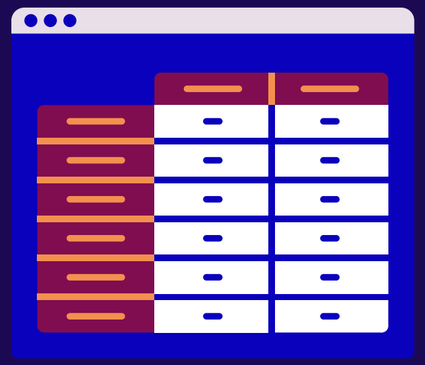


Arrests

External Agency Reports

Investigative Reports

State ID
Aliases
FBI #
Sex Offender ID
Criminal Group Name / Hierarchy
Vehicle VIN
Social Media Handle
Common Misspelling
Custom Unique ID (Name_DOB
Owning Analyst or Team
Uniform Names

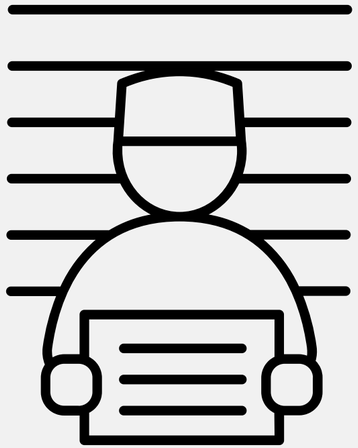


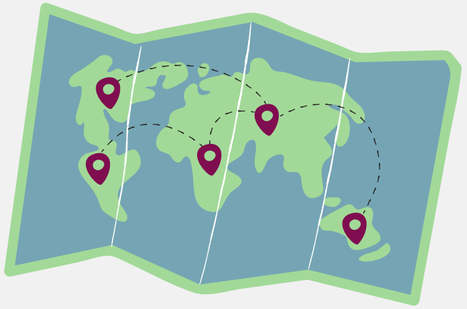
Uniform Subject, Analyst, and Criminal Group Filters

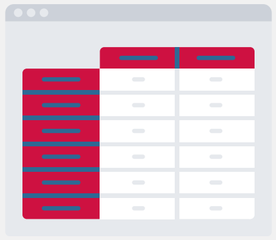
Multiple datasets on one page that can be queried or sliced simultaneously

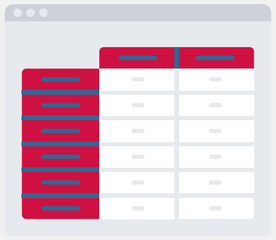
Single Option Summary Pages for Subjects, Criminal Groups, and Analyst Target Sets

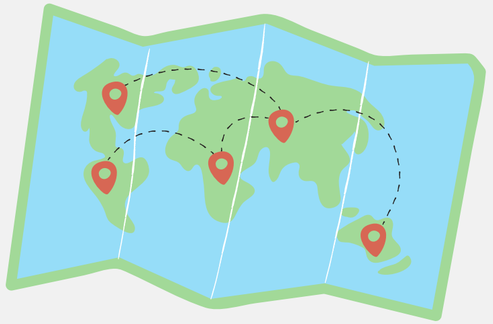
One page: mini-maps for residences, arrest locations, complaints, and suspected activity, alongside tables with the incident details and charts to count types of activity (e.g. arrest charges for a gang)
Launching pad for criminal investigative analysis and geographical profiling











- Parole
- Probation
- Social Media
- Phone #s

Landing Page with an overview of contents and contact information

Instructional Page with embedded photos

Morning Briefing Page

Subject, Analyst / Team, and Criminal Group Summary Pages

Specialized pages focusing on singular datasets

Prioritize a few key pages, the remainder are for in-depth analysis

Tooltips

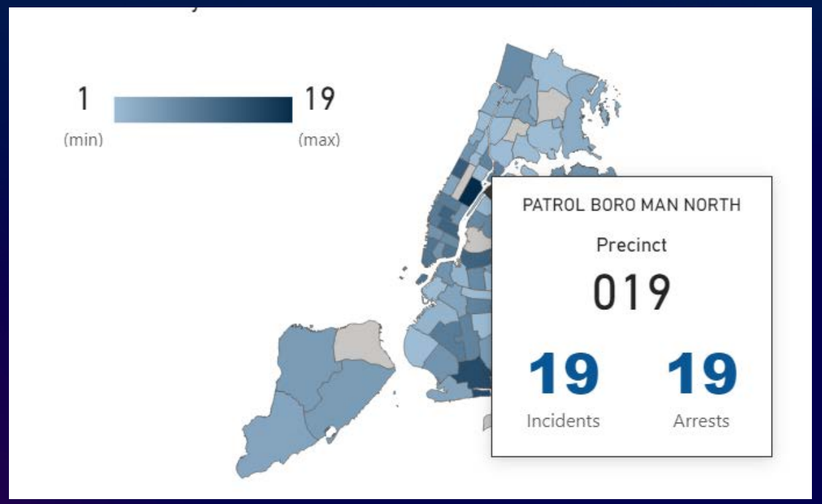
- Saves processing power
- Expand on limited space
- Reduce rows per table (e.g. a tooltip for one complaint giving the details for two associated arrests)
- Can be created for maps as well (e.g. choropleth maps can have point maps as a tooltip or point maps can have a tooltip that's a mugshot and arrest narrative)

Incident Narrative

Firearm Data

Vehicle Information

Evidence and Property Vouchered


1
(min)
19
(max)
PATROL BORO MAN NORTH
Precinct
019
19
Incidents
19
Arrests

Bronx and Pelham Pkwy
BRONXDALE
MORRIS PARK
VAN NEST
Eastchester Heights
Spencer Estates
PARKCHESTER
BRONX RIVER
UNIONPORT
SOUNDVIEW-BRUCKNER
Soundview Park Homes
Jamie Towers
Bronx River
HUNTS POINT
HARDING PARK
Eastchester Bay
SCHUYLERVILLE
PARK OF EDGEWATER
THROGS NECK
Silver Beach
City Island
CITY ISLAND
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Mapping Overview and Tips

Shape Maps

- Turn a shapefile into a TopoJSON to create custom choropleth maps
- https://mapshaper.org/ is useful for generating this type of JSON

Point Maps

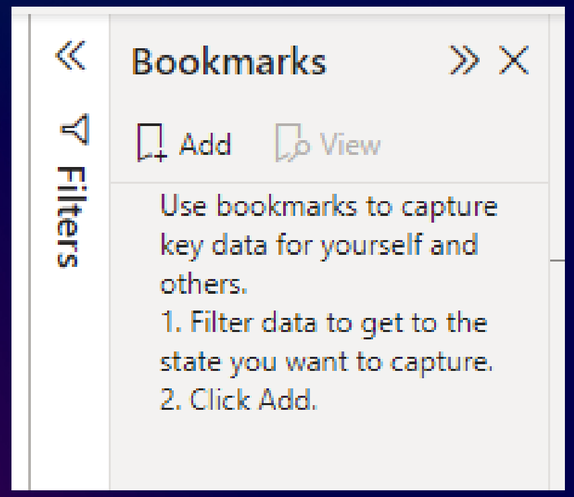
- Limited to one set of coordinates or field of addresses
- Despite this limitation, the maps are powerful and render/slice quickly
- One way around the one layer issue is to create a new table within the data model that pulls coordinates from different datasets
- You run the risk of points stacking on one another (e.g. two shootings at a housing development), but tooltips can be used to remedy this
- The Azure Mapping visual also exists, but may be restricted by your organization due to its geocoding practices
- Hidden street viewer feature

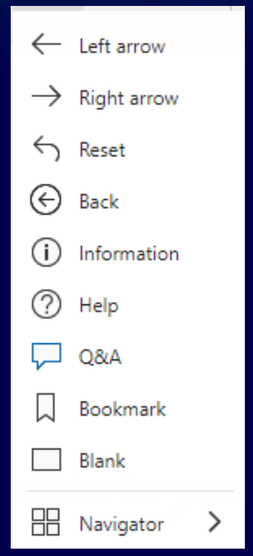
ArcGIS Maps

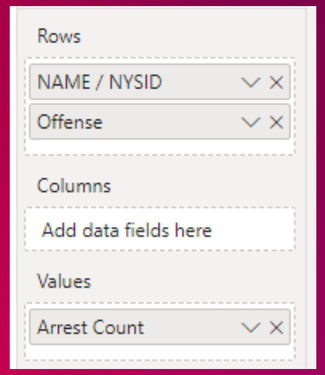
- Cannot fully customize the tooltips
- Benefits from tools, such as drive time calculations
- Pulling down reference layers from your organization's portal is very useful (e.g. referencing sexual assaults against the residences of registered offenders)
- The visibility of ArcGIS layers is still tied to group permissions

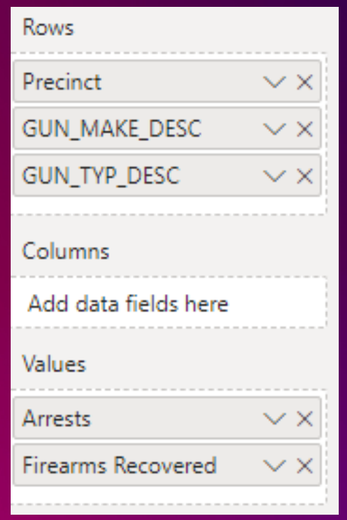
Tips and Tricks

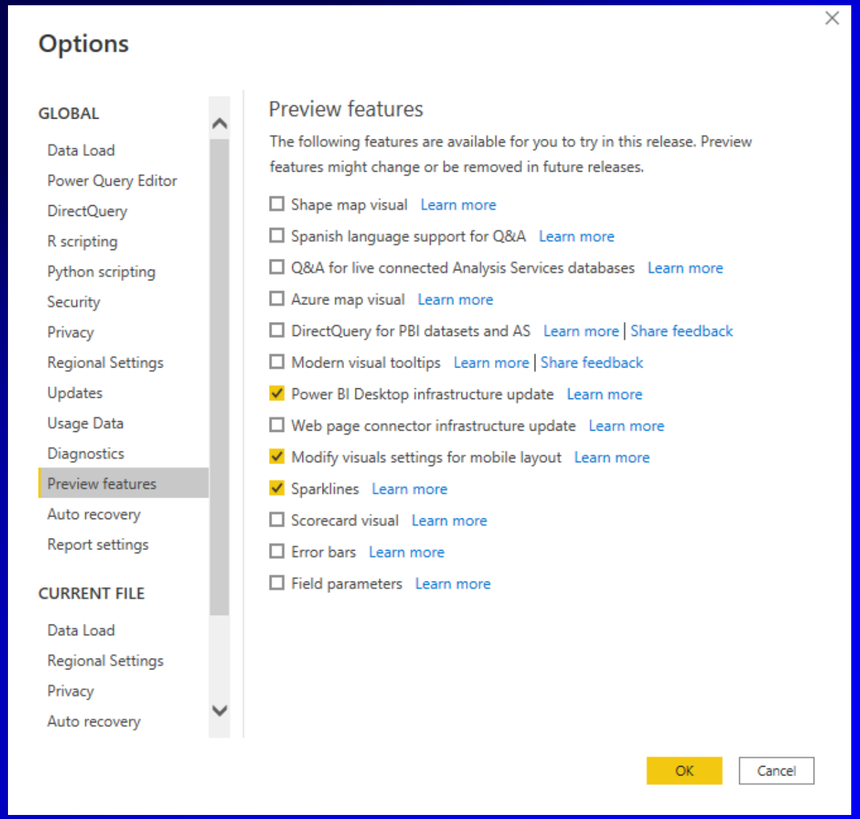
- Use Bookmarks for CompStat Views
- Enable Feature Previews
- Import custom widgets, especially the Text Filter
- Add multiple rows to a matrix visual to enable drill downs and save space
- Have a reset button unique to every page
- Hide less frequently used slicers with a pop out slider or Navigator
- Make use of Focus Mode











Online Tutorials

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Let's Connect

Please feel free to reach out after this presentation. For any formal requests, please use my HIDTA email.

Thank You