GIS Day 2018, University of Buffalo

Insights for ArcGIS – Location-Based Data Analytics: No Desktop Required

Mark Scott, Solutions Engineer, Esri-Boston

Local Government Business Development Team

mscott@esri.com

Available with Online or Enterprise

OR

ArcGIS Online

Your infrastructure
(physical, virtual, or cloud)

ArcGIS Enterprise

Analytic workflows

Visualization
- Interactive data views
- Charts, graphs, tables, and maps
- Dynamic selection & cross filtering
- Context of the largest digital atlas in world

Statistical Analysis
- Descriptive stats
- Link analysis
- Regression

Spatial Analysis
- How is it distributed?
- How is it related?
- What's nearby?
- How has it changed?

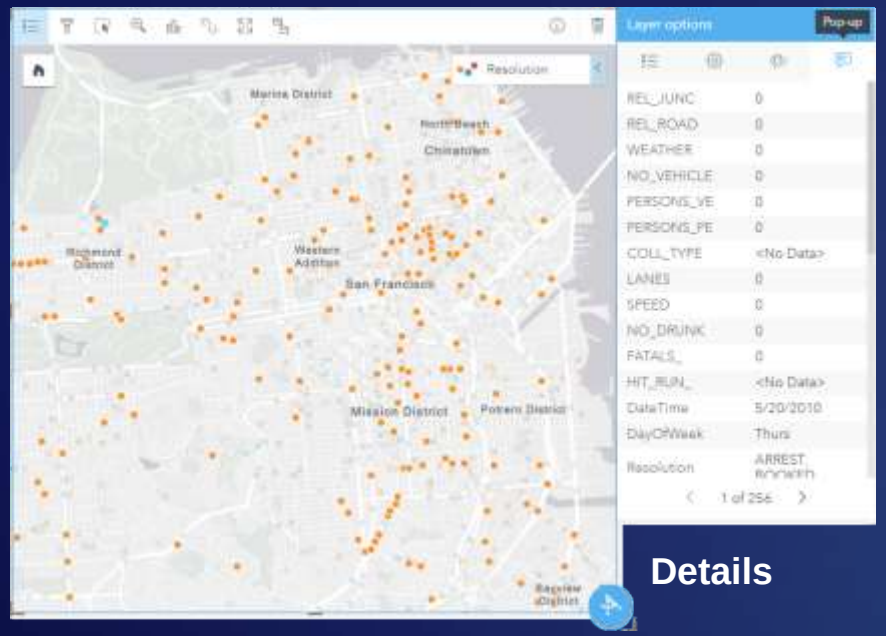
GeoEnablement
- Geocode address
- Convert X,Y
- Join to boundaries
- Join to demographic variables

Record & Repeat Analysis
- Share model to analysts
- Document best practices
- Re-run with new data

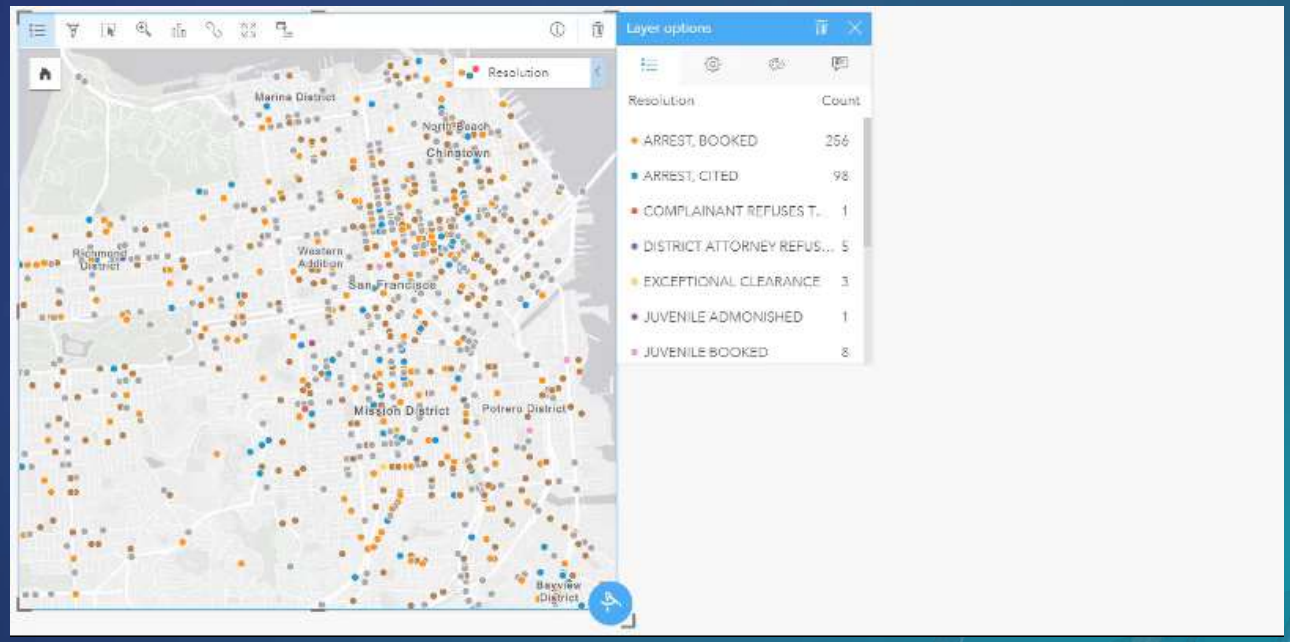
Data Preparation
- Format fields
- Calculate new fields

Share Results
- Share with executives
- Tell your story
- Share with public

Highly interactive and visual

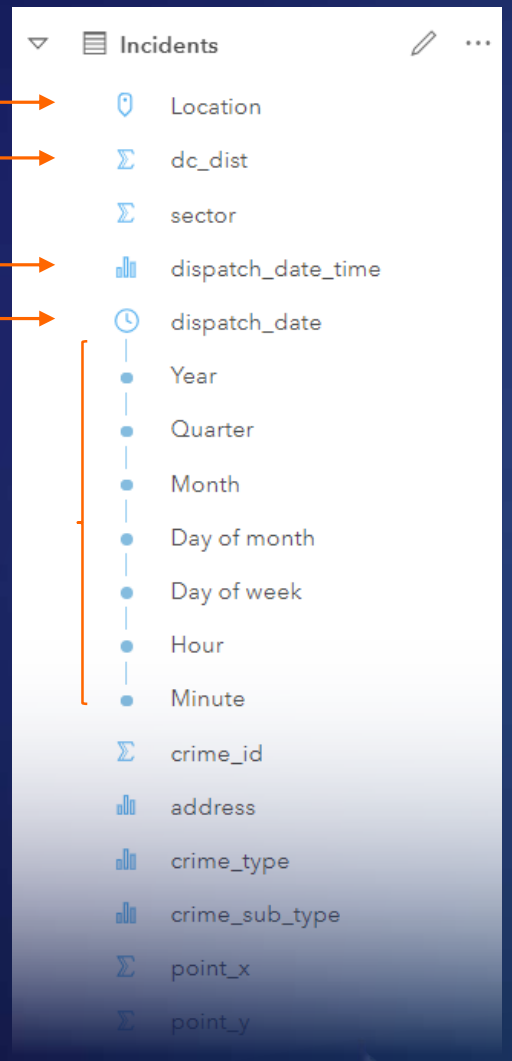


Details



Get started: Import or connect to data sources

Data pane



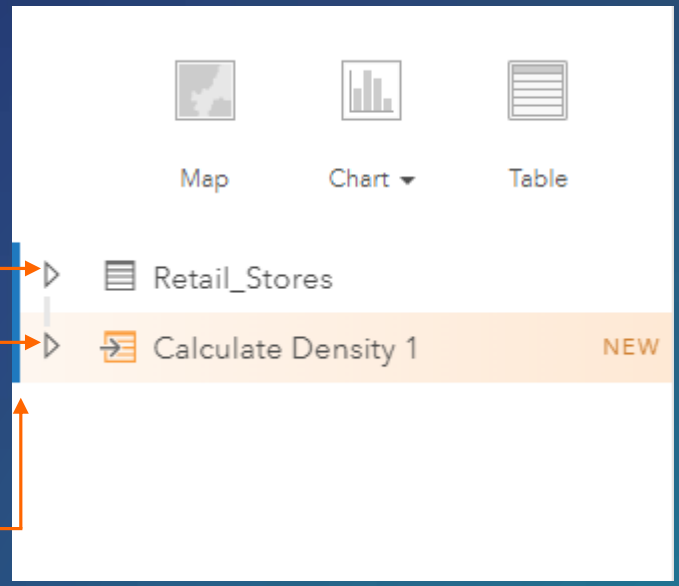
Shape field

Numeric

Categorical

Date/time

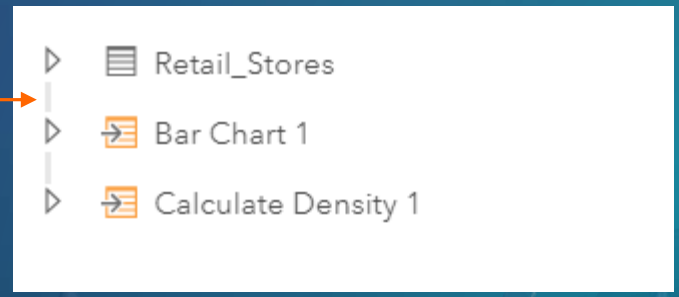
Date components



Dataset

Result dataset

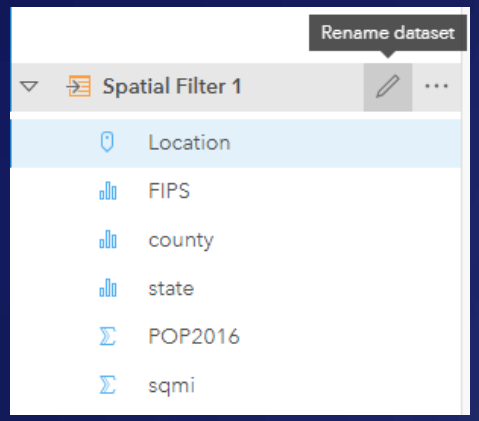
Indicates card-dataset connections



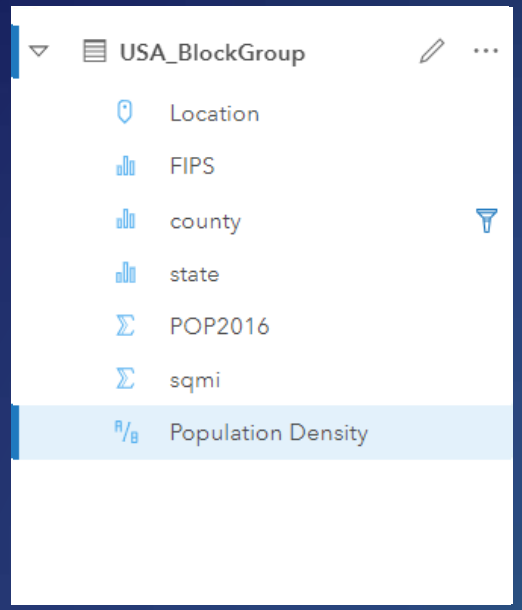
Hierarchy

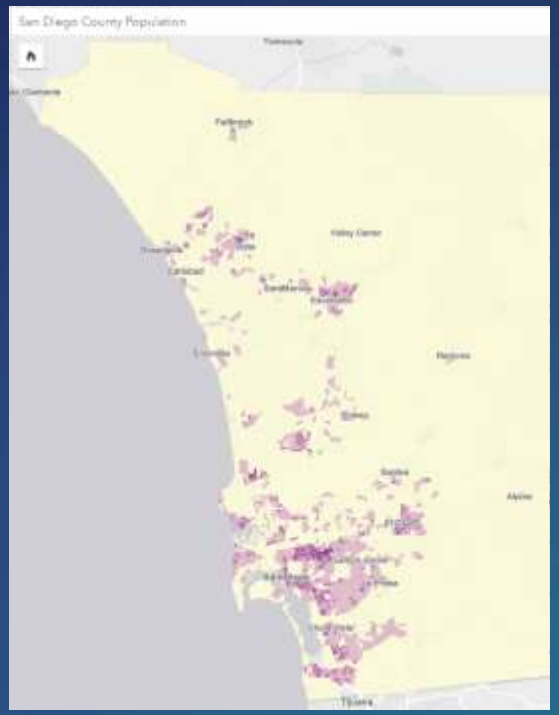
Working in Insights

Rename datasets

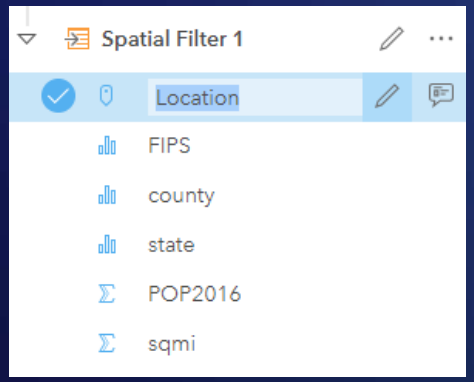


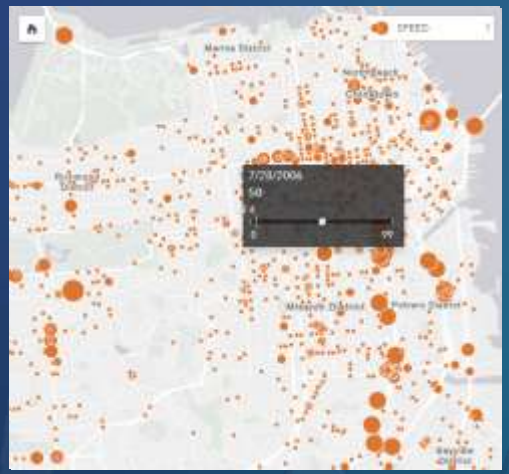
Changing the value, number to string and rate



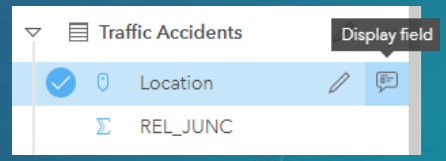


Rename fields





Add a second piece of information to the pop-up



Working with tables

Data table

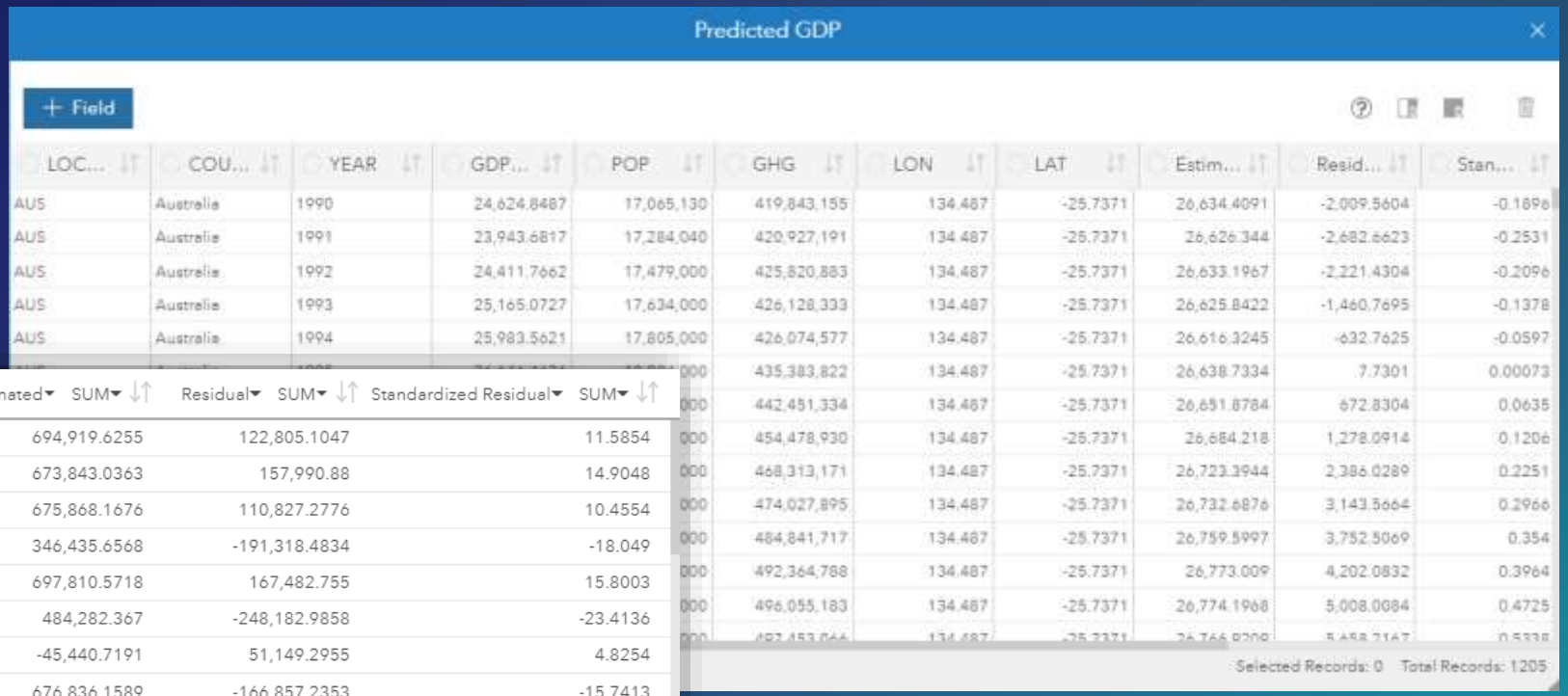


Table card

COUNTRY	COUNT of Predicted GDP	Estimated SUM	Residual SUM	Standardized Residual SUM
Australia	26	694,919.6255	122,805.1047	11.5854
Austria	26	673,843.0363	157,990.88	14.9048
Belgium	26	675,868.1676	110,827.2776	10.4554
Brazil	21	346,435.6568	-191,318.4834	-18.049
Canada	26	697,810.5718	167,482.755	15.8003
Chile	21	484,282.367	-248,182.9858	-23.4136
China (People's Republic of)	26	-45,440.7191	51,149.2955	4.8254
Czech Republic	26	676,836.1589	-166,857.2353	-15.7413
Denmark	26	676,615.3904	125,605.001	11.8496
Estonia	21	547,269.4377	-232,674.1639	-21.9505
Finland	26	676,931.9272	41,170.195	3.884
France	75	1,850,941.9244	260,569.4521	24.5821
	Total 1,205	**Total** 27,874,554.9547	**Total** -0.00025	**Total** -0.000000024

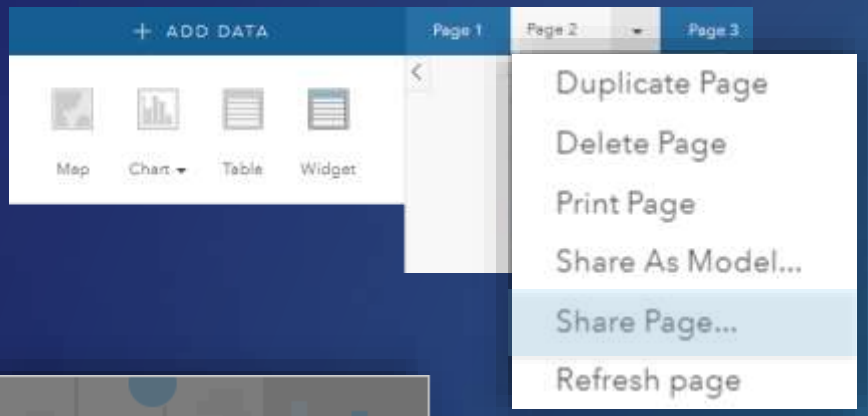
Sharing in Insights

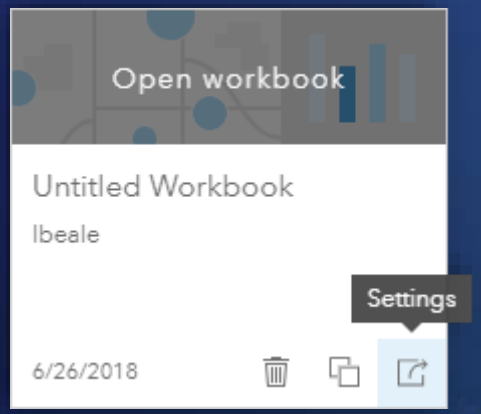
Data

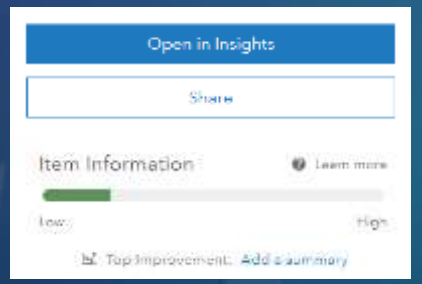
Page

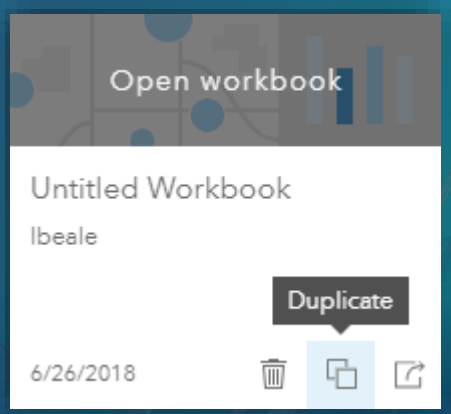
Model

Workbook









Insights for ArcGIS®

Data type: Qualitative Quantitative Temporal

Measure: ascertain the size, amount, or degree of (something)

A bar graph uses either horizontal or vertical bars to show comparisons among categories. They are valuable to identify broad differences between categories at a glance.

A treemap shows both the hierarchical data as a proportion of a whole and, the structure of data. The proportion of categories can easily be compared by their size.

Bubble charts represent numerical values of variables by area. With two variables (category and numeric), the circles placed so they are packed together.

A heat chart shows total frequency in a matrix. Values in each cell of the rectangular grid are symbolized into classes.

Relationship: a connection or similarity between two or more things or, the state of being related to something else

A choropleth map allows quantitative values to be mapped by area. They should show normalized values not counts collected over unequal areas or populations.

A chord diagram visualizes the inter-relationships between categories and allows comparison of similarities within a dataset or, between different groups of data.

Scatterplots allow you to look at relationships between two numeric variables with both scales showing quantitative variables. The level of correlation can also be quantified.

Link analysis is used to investigate relationships between entities where and an entity is an object, person, place or event. Links connect two or more entities.

Spider lines , also termed desire lines, show paths between origins and destinations. They show connections between places.

Change: process through which something becomes different, often over time

A bar graph uses either horizontal or vertical bars to show comparisons among categories. They are valuable to identify broad differences between categories at a glance.

A heat chart shows total frequency in a matrix. Using a temporal axis values, each cell of the rectangular grid are symbolized into classes over time.

Bubble charts with three numeric variables are multivariate charts that show the relationship between two values while a third value is shown by the circle area.

Graduated symbol maps show a quantitative difference between mapped features by varying symbol size. Data are classified with a symbol assigned to each range.

A Density/heat map calculates spatial concentrations of events or values enabling the distribution to be visualized as a continuous surface.

A Data clock creates a circular chart of temporal data, commonly used to see the number of events at different periods of time.

Line graphs visualize a sequence of continuous numeric values and are used primarily for trends over time. They show overall trends and changes from one value to the next.

A combo chart combines two graphs where they share common information on the x-axis. They allow relationships between two datasets to be shown.

Interaction: flow of information, products or goods between places

A chord diagram visualizes the inter-relationships between categories and allows comparison of similarities within a dataset or, between different groups of data.

Spider lines, also termed desire lines, show paths between origins and destinations. Flow maps show directional connections and flow between places.

Distribution: the arrangement of phenomena, could be numerically or spatially

Histograms show the distribution of a numeric variable. The bar represents the range of the class bin with the height showing the number of data points in the class bin.

A box plot displays data distribution showing the median, upper and lower quartiles, min and max values and, outliers. Distributions between many groups can be compared.

A choropleth map allows quantitative values to be mapped by area. They should show normalized values not counts collected over unequal areas or populations.

Graduated symbol maps show a quantitative difference between mapped features by varying symbol size. Data are classified with a symbol assigned to each range.

A Density/heat map calculates spatial concentrations of events or values enabling the distribution to be visualized as a continuous surface.

A unique symbol map (areas or points) allows descriptive (qualitative) information to be shown by location. Areas have different fills and points can be geometric or pictorial.

Part-to-whole: relative proportions or percentages of categories, showing the relationship between parts and whole

Donut charts are used to show the proportions of categorical data, with the size of each piece representing the proportion of each category.

A treemap shows both the hierarchical data as a proportion of a whole and, the structure of data. The proportion of categories can easily be compared by their size.

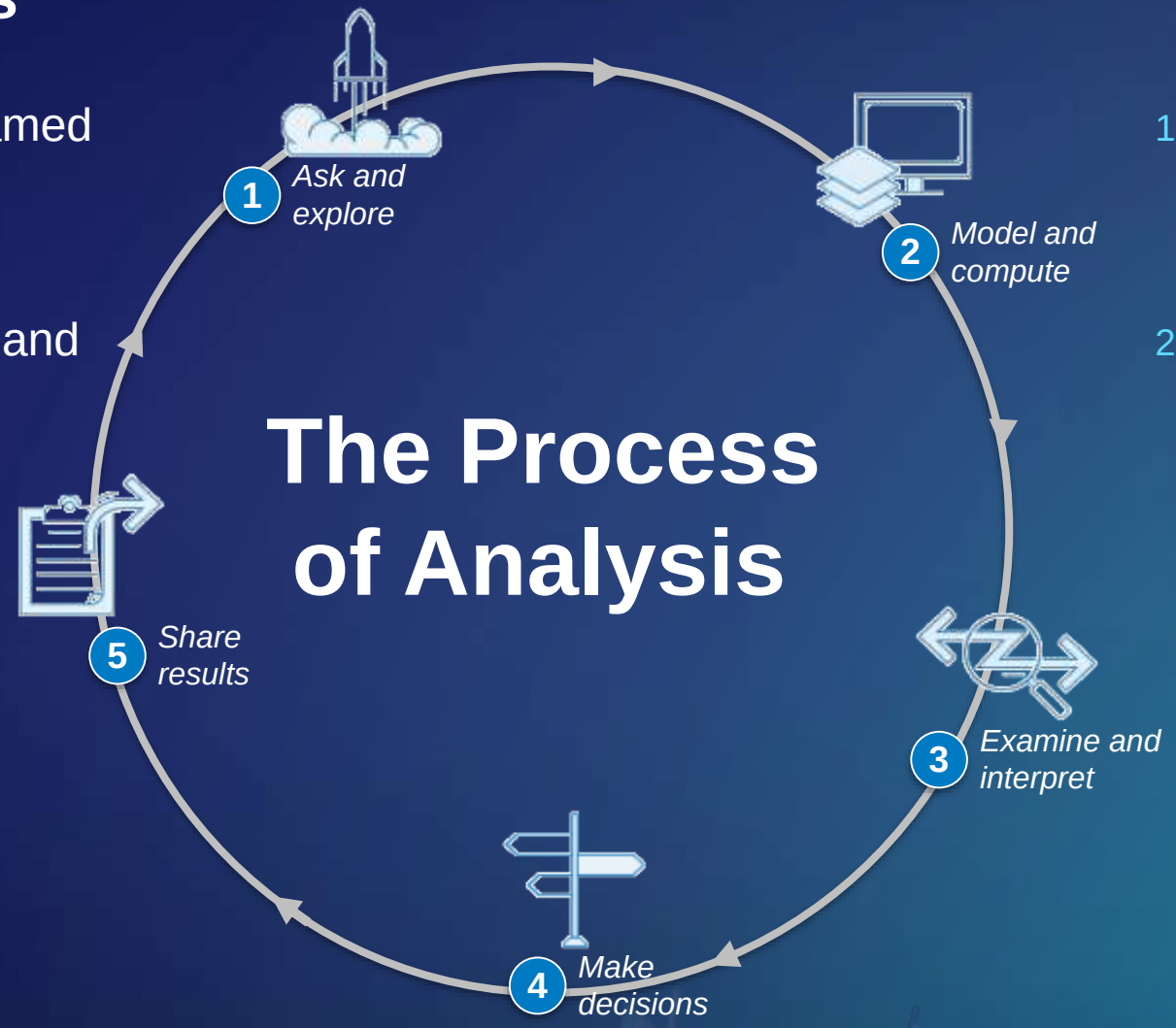
Acknowledgement
Inspired by work by Jon Schwabish and Severino Ribecca, The Graphic Continuum, 2014 and, Alan Smith et al. Visual Vocabulary, The Financial Times, 2016

esri

Linda Beale PhD, 2017

Steps of Analysis

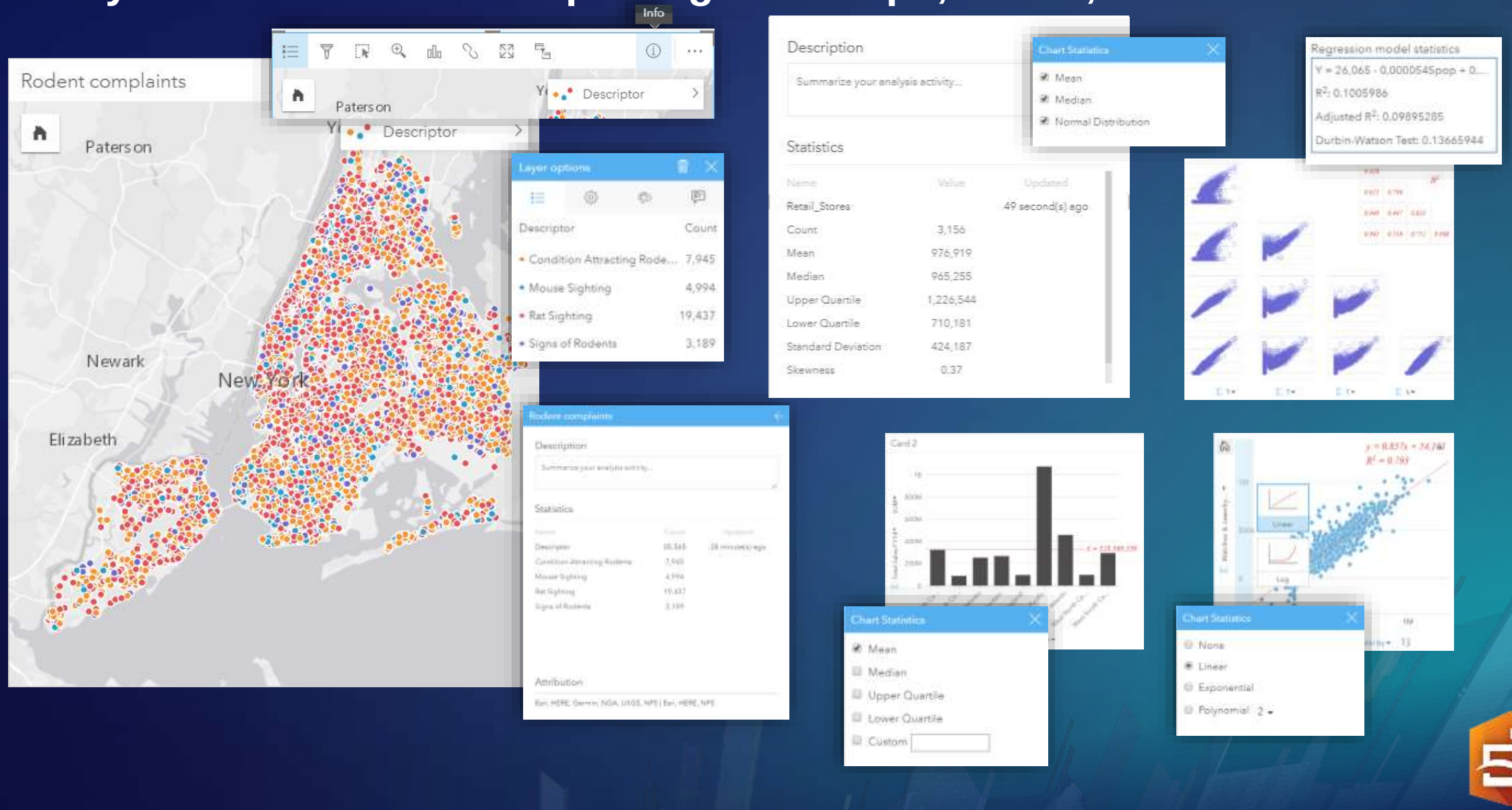
1. Begins with a well-framed question
2. Manipulate, quantify, and manage your data



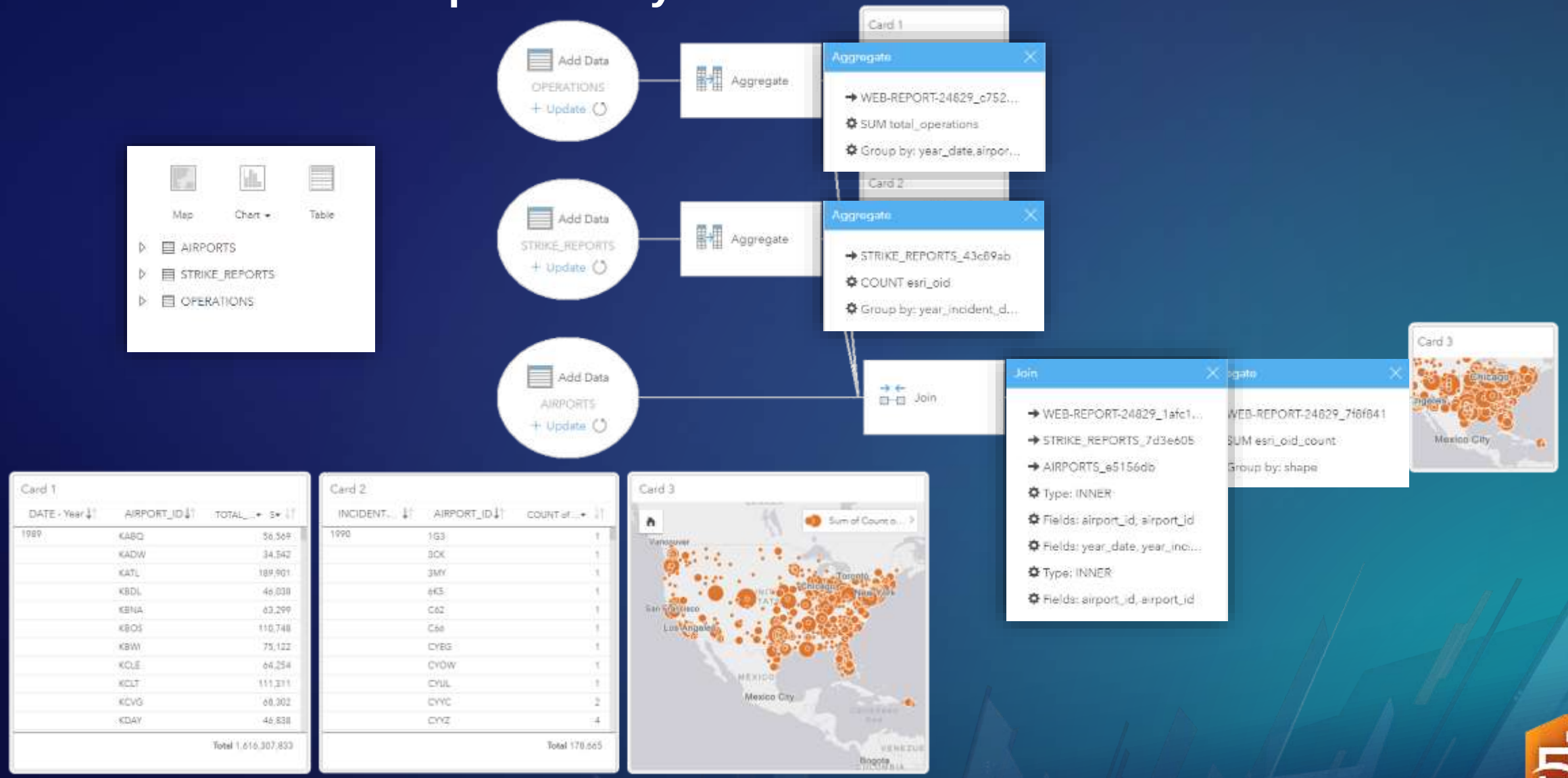
1. Increasingly data is being automatically collected
2. The analyst must find the value in the collected data

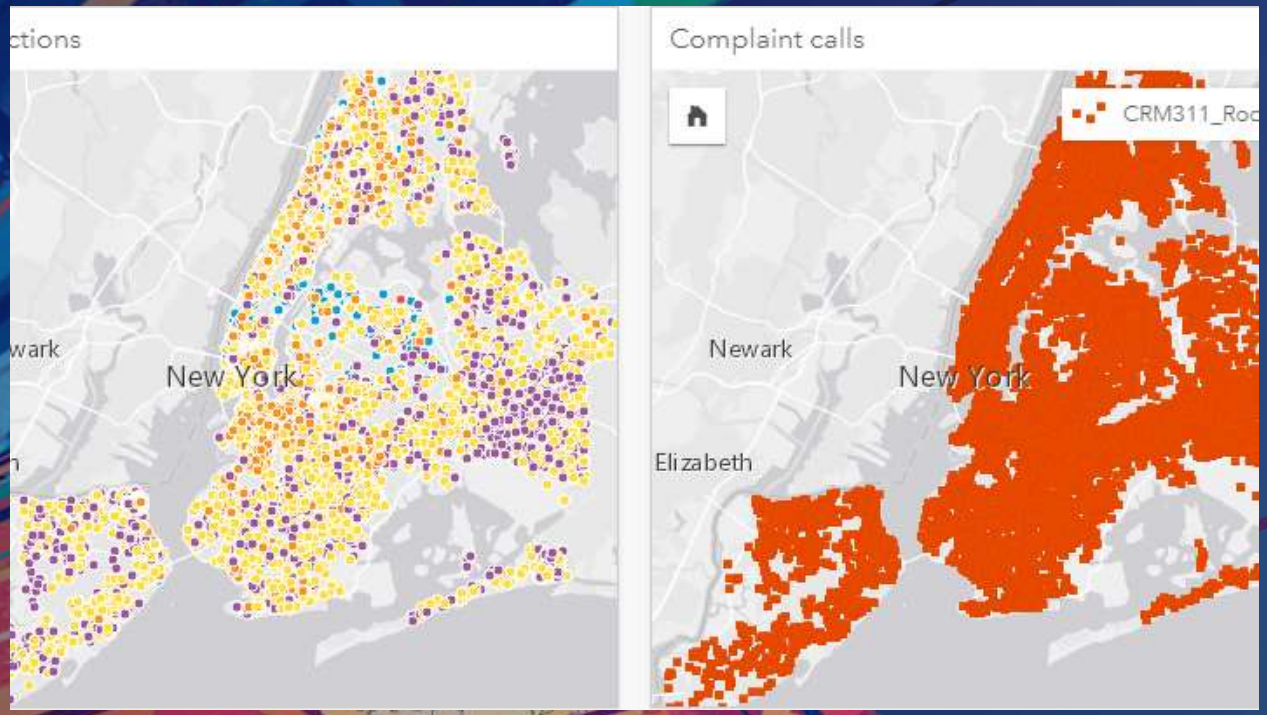
An analyst must understand the data, analysis and the intersection between the two

Quantify results: Statistical reporting with maps, tables, and charts



A window into the steps of analysis





Analysis of Crime in Boston

Mark Scott

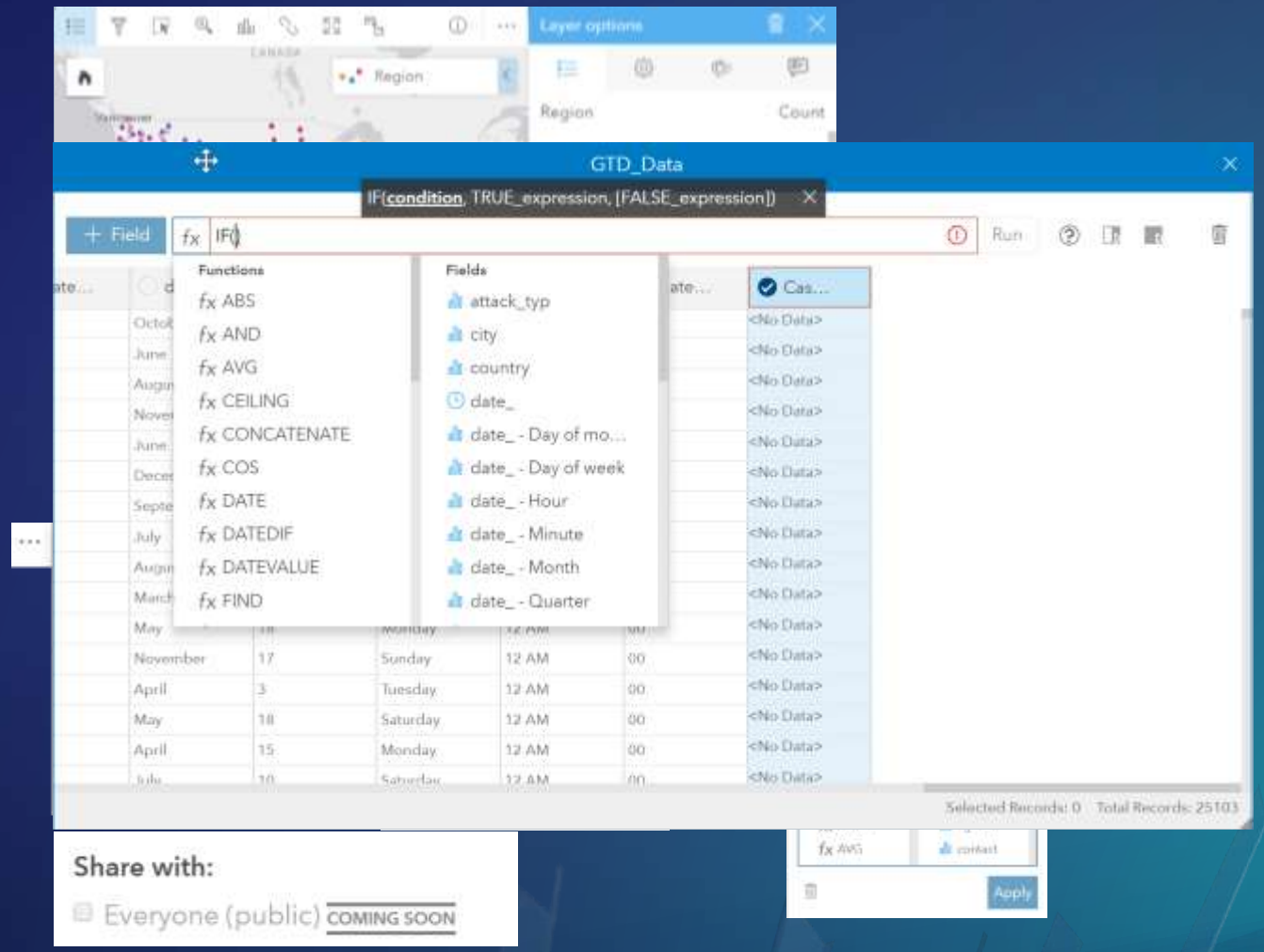
Coming Soon…

Change unique colors

Calculate field

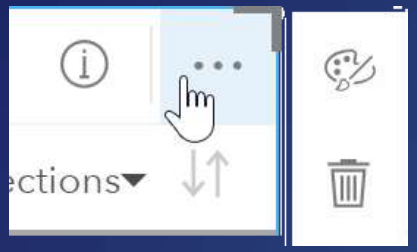
Advanced filters

Public sharing (Online)

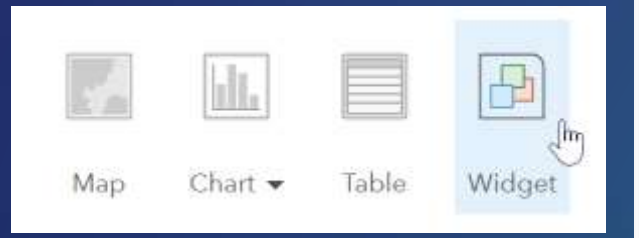


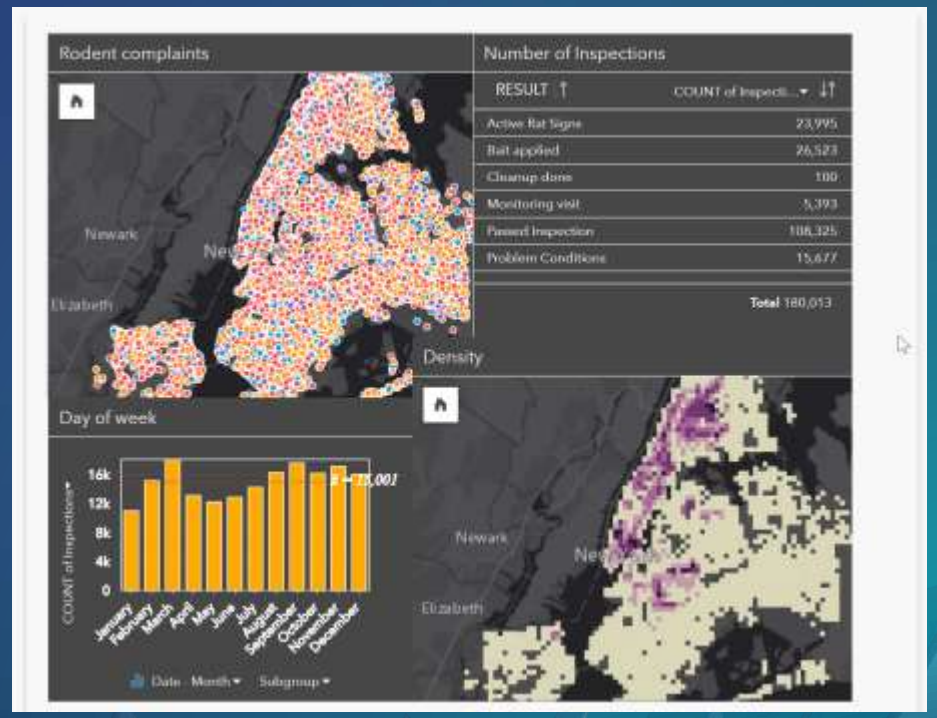
Analytic Journals

- **Page and card options**



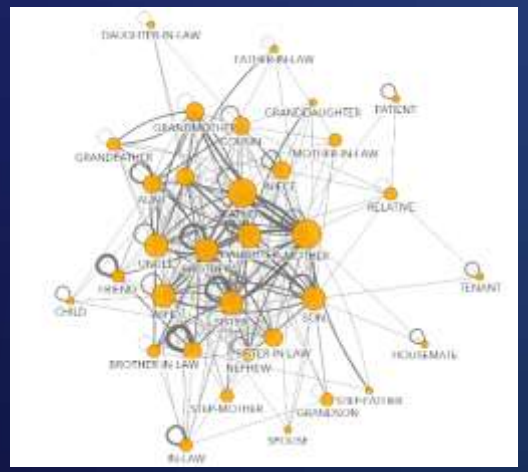
- **Widgets**
  - **e.g. rich text card**





Link Analysis +

- Used to investigate relationships between entities
  - where and entity is an object, person, place or event
  - A link connects two or more entities
- Link charts
- Spider lines/Desire lines
- Flow maps



Questions?
Slide deck will be made available
mscott@esri.com

esri
THE
SCIENCE
OF
WHERE