

# EXPLORING MAPS

## in Microsoft Power BI

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**BLUEGRANITE**  
DATA • INSIGHTS • ANALYTICS

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## Introduction

Maps are a unique form of data visualization that people have designed and studied for hundreds of years. A well-crafted map draws viewers in with a blend of visual appeal and understandable content. As with any visual, you should put careful thought into how you represent locations in Microsoft Power BI so that your users gain more insight into the data. Simply making maps is not enough if users cannot comprehend them.

With rapid increases in the ability to track, store, and access data, many businesses have a wealth of proprietary and third-party geospatial data available to them. With software such as Power BI, you can quickly obtain, cleanse, blend, and visualize this data on maps. The science of making and studying maps is called cartography, but you likely will not encounter that term when working with Power BI. Power BI developers may not be professional cartographers, but they are certainly *mapmakers*. With a Business Intelligence tool, you do not have access to every bell and whistle that a professional GIS (Geographic Information System) program offers. For a general business audience, however, Power BI has several ways to easily craft maps that work well for common use.

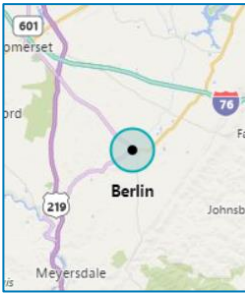
This document presents a foundation to help you prepare and visualize geospatial data in Microsoft Power BI.

## Considerations with Geographic Data

When working with geography in Power BI, there are ways to optimize your data that provide a better experience for your audience. Here are a few considerations to keep in mind:

- The most precise locations are mapped as points using *latitude* and *longitude*. Power BI will attempt to geocode locations into latitude and longitude coordinates using Bing. Geocoding accuracy is not always guaranteed. Ambiguous location names or not setting a field's **Data Category** may lead to erroneous locations plotted on a map. More information about data categories appears later in this document.
- Being more specific leads to higher geocoding accuracy. Including a more specific identifier when plotting fields such as cities may reduce issues, e.g. "Berlin, PA" instead of "Berlin".
- The *Text Data Type* is a better option for postal codes since they are categorical and not continuous numeric values. Do *not* use a **Data Type** of *Whole Number* for postal codes. Any postal codes with leading zeros will be trimmed to less than the expected number of digits.
- Be careful if you need to join tables using a geography field in the relationship. Verify whether your geography values align between the two tables so that the relationship will work the way you expect. For example, a relationship based on *ISO ALPHA-3* or *UN M.49* country codes would be more reliable than a relationship based on country names.

### Example: Berlin, Pennsylvania, United States of America



Berlin	Too vague. Will plot as Berlin, Germany.
Berlin, PA	Good
Berlin, PA, USA	Better
Latitude: 39.92	Best
Longitude: 78.96	

### Example: United States Postal Code 07059

Code	Description	Modeling		Result
07059	Treated as continuous number	Data type: Whole Number Format: Whole number \$ - % , .00 0	Home Table: Data Category: Postal Code Default Summarization: Sum	
07059	Text, possibly too vague	Data type: Text Format: Text \$ - % , .00 Auto	Home Table: Data Category: Postal Code Default Summarization: Don't s	
07059	Text, best result when paired with Country field	Data type: Text Format: Text \$ - % , .00 Auto	Home Table: Data Category: Postal Code Default Summarization: Don't s	

### Example: Relationships between tables based on Country

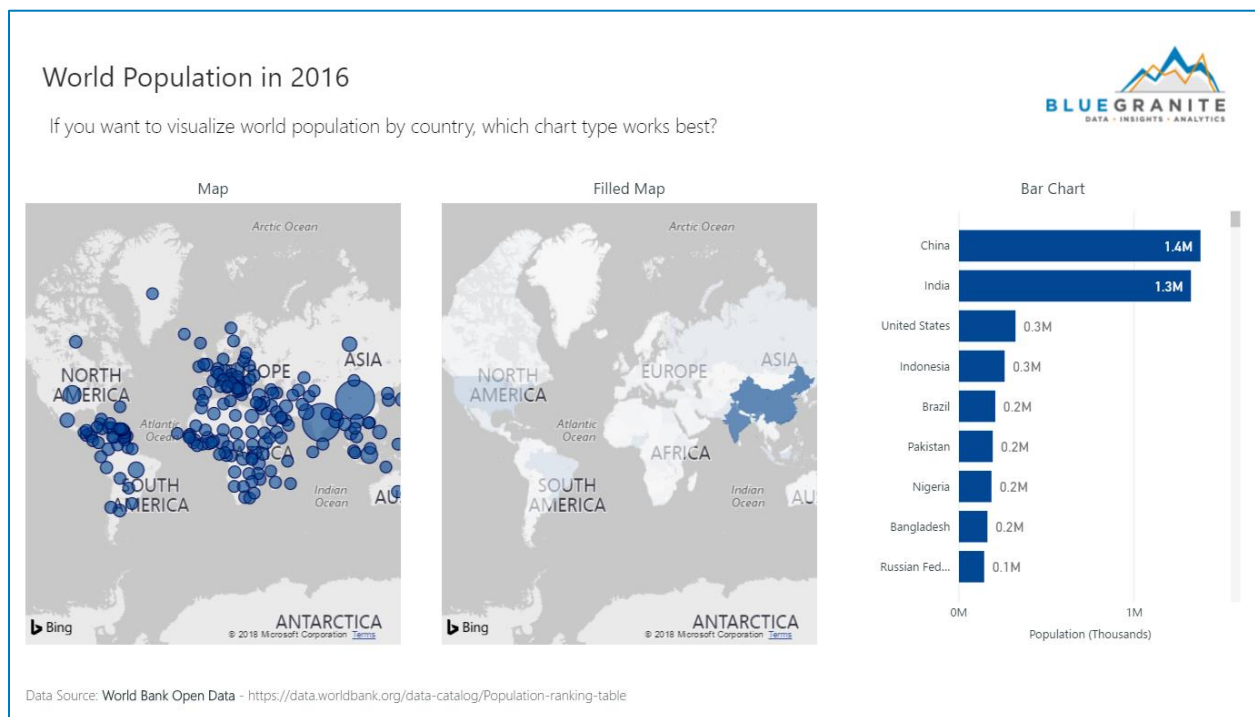
Relationships based on <b>NAME</b> : Will not always work as expected	Relationships based on <b>CODE</b> : More reliable																
<p>Create relationship</p> <p>Select tables and columns that are related.</p> <p>Table1</p> <table border="1"> <tr> <td>Country</td> <td>ISO Alpha-3</td> </tr> <tr> <td>United States</td> <td>USA</td> </tr> </table> <p>Table2</p> <table border="1"> <tr> <td>Country</td> <td>ISO Alpha-3</td> </tr> <tr> <td>US</td> <td>USA</td> </tr> </table>	Country	ISO Alpha-3	United States	USA	Country	ISO Alpha-3	US	USA	<p>Create relationship</p> <p>Select tables and columns that are related.</p> <p>Table1</p> <table border="1"> <tr> <td>Country</td> <td>ISO Alpha-3</td> </tr> <tr> <td>United States</td> <td>USA</td> </tr> </table> <p>Table2</p> <table border="1"> <tr> <td>Country</td> <td>ISO Alpha-3</td> </tr> <tr> <td>US</td> <td>USA</td> </tr> </table>	Country	ISO Alpha-3	United States	USA	Country	ISO Alpha-3	US	USA
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US	USA																

## Is a Map Necessary?

Maps on a Power BI report have value when a location itself, or when distance between locations, carries importance. A geospatial answer is often appropriate when addressing a geospatial question. Simply plotting a company's warehouse or store locations on a map may or may not be an important part of a data story. Using a map to visualize the *quantity* of materials flowing through a supply chain *between those locations* may be critical though. When developing your reports, determine whether visualizing locations on a map is the best means to get the point across.

When working with geographic data, it is often suitable to *avoid* using maps. While it is a common temptation to use a map to plot *any* location data, always consider whether a map is the most appropriate choice to convey the meaning of that data. Sometimes maps may cause more confusion than another chart type or otherwise do more harm than good.

To illustrate, let's look at a sample report that displays world population. The report compares three ways of visualizing the approximate number of people in each country. On the left, Power BI's *Map* visual plots each country as a point. Countries with more people have a larger circle. In the center, Power BI's *Filled Map* visual shades each country's area so that a larger population appears darker (a choropleth map). On the right, a bar chart displays the most populous countries toward the top.



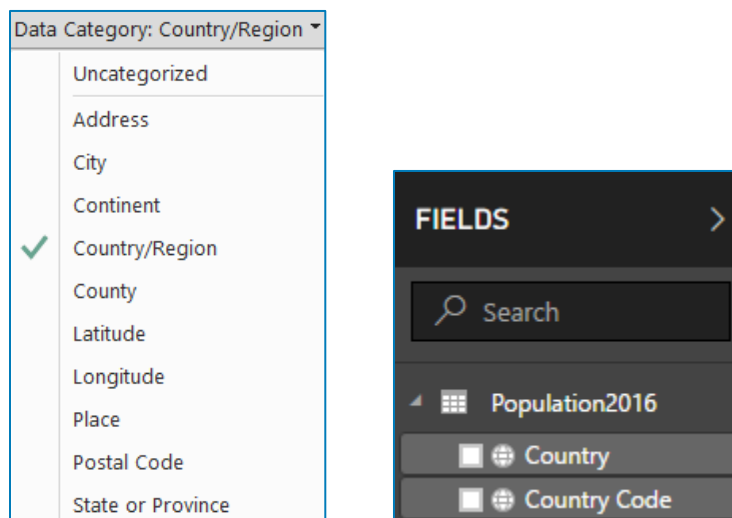
What is the analytical value of displaying population by country? Is there any? If so, is this value compromised when using a map instead of a bar chart? With over 200 countries represented, it is difficult to gauge relative difference in population when using point size or color saturation. China and India stand out as larger circles or a darker shade, but there is little value to these maps other than vaguely demonstrating that China and India have the most people. The two maps do not help answer a quantitative question, such as "How many more people reside in China versus another country?" With its bar length and data labels, the bar chart is more effective at visually and

quantitatively demonstrating population difference between countries. The bar chart also strikes a balance between the visual noise of the *Map* and the visual scarcity of the *Filled Map*. Viewers do not need to see every country in the world to determine that two countries predominate, but they also need to see more than those two countries to gauge where the others fall in relation.

In summary, do not rely on maps alone because you have location data. Know enough about the data to determine whether a map is a good choice for data visualization.

## Data Categories

Power BI has a set of data categories that influence how location data appears when visualizing it. When you select a field, you find a list of options to help classify that field on the **Modeling** tab in the **Data Category** menu. After labelling a field as a geographic category, you will see a globe icon next to it in the **Fields** pane.



The following example illustrates how properly setting a Data Category impacts the display of a Power BI map. With potentially ambiguous location values, verify that locations appear as expected. A field containing the common location name “Washington” displays in many different ways. Power BI plots Washington as the U.S. state if you leave the Data Category as *Uncategorized*. Although there are 31 U.S. states that contain a county named Washington, Power BI plots the county in Utah if you set the Data Category to *County*. It does not attempt to plot all 31 counties. Similarly, setting the Data Category to *City* relocates the map to Washington, DC.

Be specific and descriptive with your data, and always remember to set and test a Data Category for geographic fields. For ambiguous locations, this may require you to append a state name or abbreviation to plot something in the correct location, e.g. “Washington County, NY” in place of “Washington” and properly categorized as *County*.

## Importance of Data Categories

Data Category influences the position of a field containing "Washington"



Washington as State



Washington as County



Washington as City



Washington as Place



Washington as Address



Washington Uncategorized



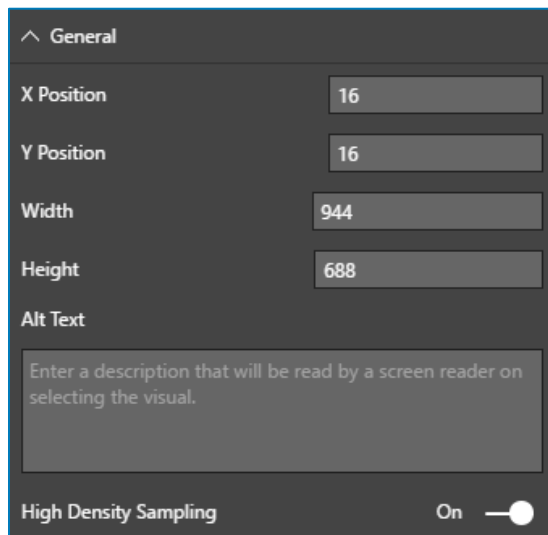
In order to categorize a field as either *Latitude* or *Longitude*, change the **Data Type** to *Decimal* or *Fixed Decimal* before changing the **Data Category**. To display Latitude and Longitude as pairs, you must also change the **Default Summarization** to *Don't summarize*.

Data type: Decimal Number ▾	Home Table: ▾
Format: Decimal number ▾	Data Category: Longitude ▾
\$ ▾ % ▾ , ▾ .00 0 ▾	Default Summarization: Don't summarize ▾
Formatting	Properties

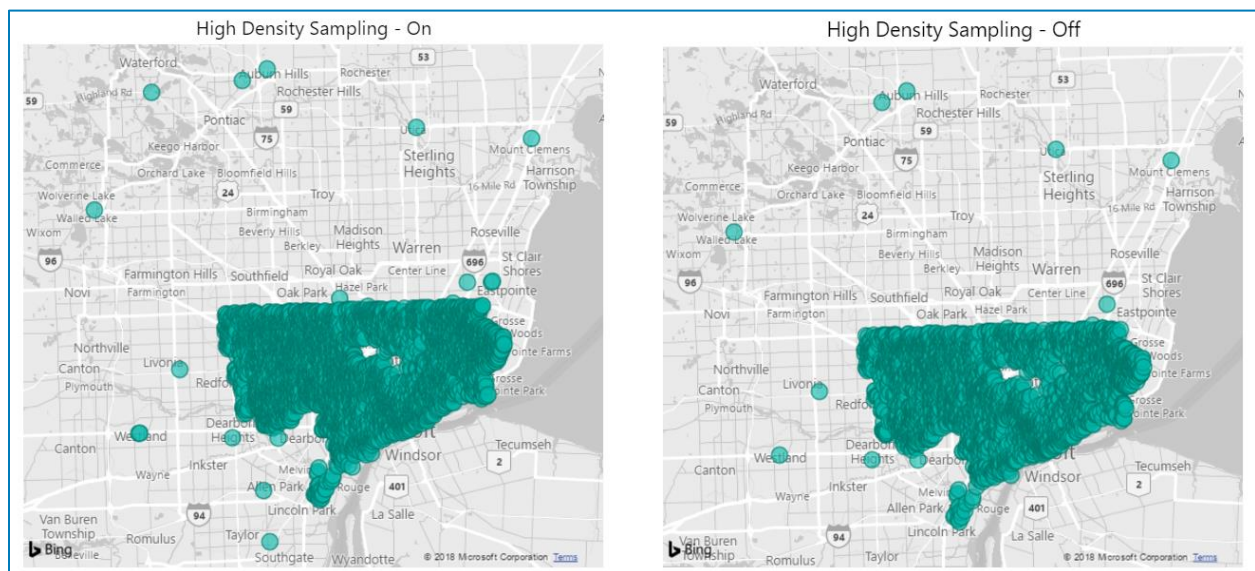
## High Density Sampling

If you have numerous locations to plot, the Power BI *Map* visual uses a setting called *High Density Sampling* that may alter the appearance of your map. The other three core maps (*Filled Map*, *ArcGIS Map*, and *Shape Map*) currently do not employ the High Density Sampling algorithm. The purpose of sampling is to algorithmically select which points to display on the map if the number of records exceed what Power BI allows. Power BI does its best to preserve the overall look of the data while balancing performance by showing only 3,500 points.

The High Density Sampling setting is enabled by default, but report authors have the option to disable it toward the bottom of the **General** card in the **Format** menu.



If your report requires plotting a large number of points, and it appears that High Density Sampling does not accurately represent the data, consider using filters or slicers to narrow down how much data appears at once. In the following example, notice how a few additional outlying points appear on the map to the left when sampling is enabled. These locations are not shown when the algorithm is disabled. While there is not much value in the detail of this map due to the large number of overlaid points, it helps demonstrate how High Density Sampling captures a better view of *all* of your data.





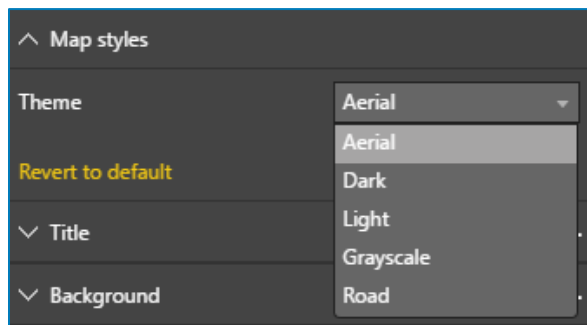
## Themes / Basemaps

The *Map* and *Filled Map* allow report developers to choose between five different Bing Maps *themes*, or backgrounds. *ArcGIS Maps for Power BI* uses *basemap* as its terminology to represent the same concept. The *Shape Map* does not have an option for a background. Some custom visuals may offer similar options while others offer none at all.

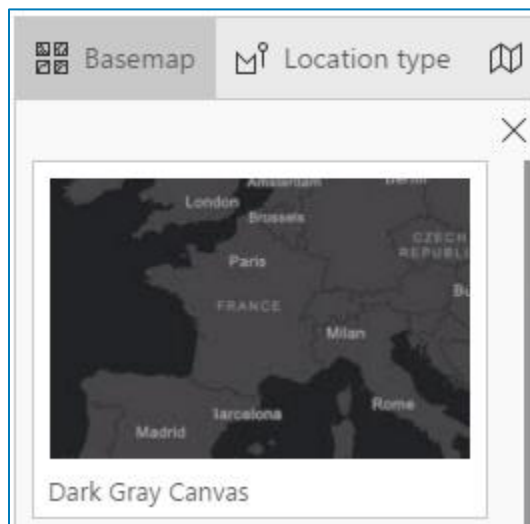
Different map themes have different advantages. From a data visualization perspective, it is helpful for authors to:

- 1) Select a background that places the focus on the data rather than the background.
- 2) Choose data colors that contrast with, rather than blend into, the background.

Bing Themes include **Road** (default), **Aerial**, **Dark**, **Light**, and **Grayscale**. For the *Map* and *Filled Map*, select different themes using the *Map styles* card in the *Format* pane.




ArcGIS Basemaps include **Light Gray Canvas** (default), **Dark Gray Canvas**, **OpenStreetMap**, and **Streets**. Select different basemaps using the *Basemaps* option within the *Edit* window. Note that *ArcGIS Maps* also has an option for *Map theme*, but this option is unrelated to the Bing themes found in the other map types.



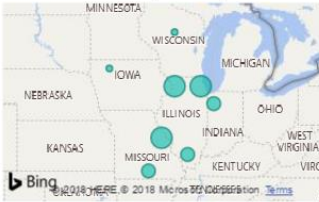
Here is a summary view of different theme/basemap options within Power BI's core map types.

### Bing Themes


*Map and Filled Map allow authors to select between five different backgrounds*



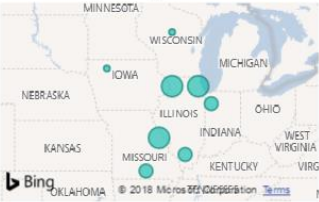
**Road (default)**




**Aerial**




**Light**



**Dark**




**Grayscale**




### ArcGIS Basemaps


*ArcGIS Maps for Power BI allow authors to select between four different basemaps*



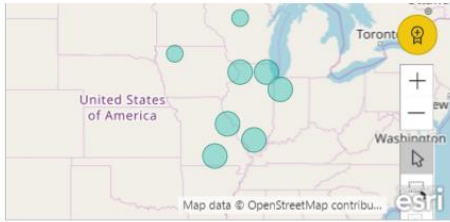
**Light Gray Canvas (default)**




**Dark Gray Canvas**



**Open Street Map**



**Streets**



## What Are Your Map Options?

There are numerous ways to map data in Power BI using a variety of different visuals. Rather than relying on a single visual to handle multiple uses, Power BI has a series of core visuals and several more custom visuals to create maps. Each choice has strengths and weaknesses depending on your needs. Microsoft's Power BI product team maintains the core visuals. A combination of Microsoft, its partners, and the Power BI community have helped create custom visuals. If you are ambitious, you could even create your own custom visual as well.

### Core / Built-In Visuals

Map
Filled Map
ArcGIS Maps for Power BI
Shape Map

### Custom Visuals

Mapbox
Route Map
Flow Map
Heatmap
Icon Map
Synoptic Panel by OKViz
Drilldown Choropleth
Drilldown Cartogram
Globe Map
Globe Data Bars

### Develop Your Own

Custom Visual
R Visual

## Core: Map

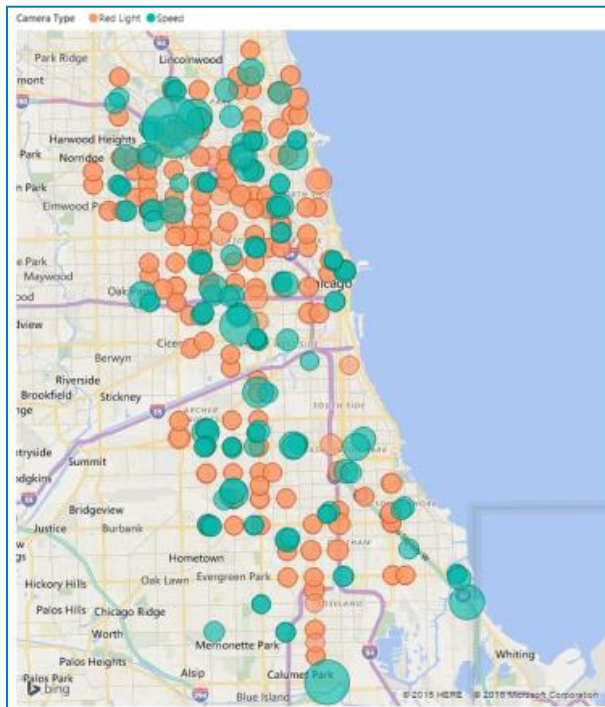
The *Map* is a core Power BI visual that displays points. These points can optionally be sized as area bubbles. The *Map* is a good option for basic display but falls short when it comes to more advanced customization. Adding series values to the Legend allows you to represent different categories. Separate categories at a given point can also display as pie charts.

### Pros

- Accessible, easy to use, and fully supported by the Microsoft Power BI team
- Includes a variety of styles beyond the default **Roads: Aerial, Grayscale, Light, Dark**
- Point size can be adjusted with a “Bubble” option to show a range of sizes
- Flexible map that can geocode locations or work with stored latitude and longitude coordinates
- A solid, basic map for common uses

### Cons

- Occasional geocoding issues where points end up in the wrong location even with careful data categorization
- Does not offer additional layers or custom data in standard geographic formats such as Esri Shapefiles or GeoJSON
- Pie charts used as points may be confusing if there are too many categories



## Core: Filled Map

The *Filled Map* is a core visual that displays shaded geographic areas. Another common name for this is a choropleth map. The *Filled Map* is another good map that suits many common uses. It relies on color scales and saturation to show different values coded as areas on the map.

### Pros

- Accessible, easy to use, and fully supported by the Microsoft Power BI team
- Includes a variety of styles beyond the default **Roads: Aerial, Grayscale, Light, Dark**
- Flexible map that can geocode locations or work with stored latitude and longitude coordinates
- A solid, basic map for common uses

### Cons

- Occasional geocoding issues where polygons end up in the wrong location even with careful data categorization
- Does not offer additional layers or custom data in standard geographic formats such as Esri Shapefiles or GeoJSON



## Core: ArcGIS Maps for Power BI

*ArcGIS Maps for Power BI* was developed by Esri, a leader in geospatial software and spatial data. It has a separate ArcGIS family of products. There are several unique features such as drivetime radius and clustering that you currently cannot show with any other Power BI map. Since its introduction, there have been several improvements. Administrators may enable or disable its use for an entire organization in the Admin Portal in the Power BI Service.

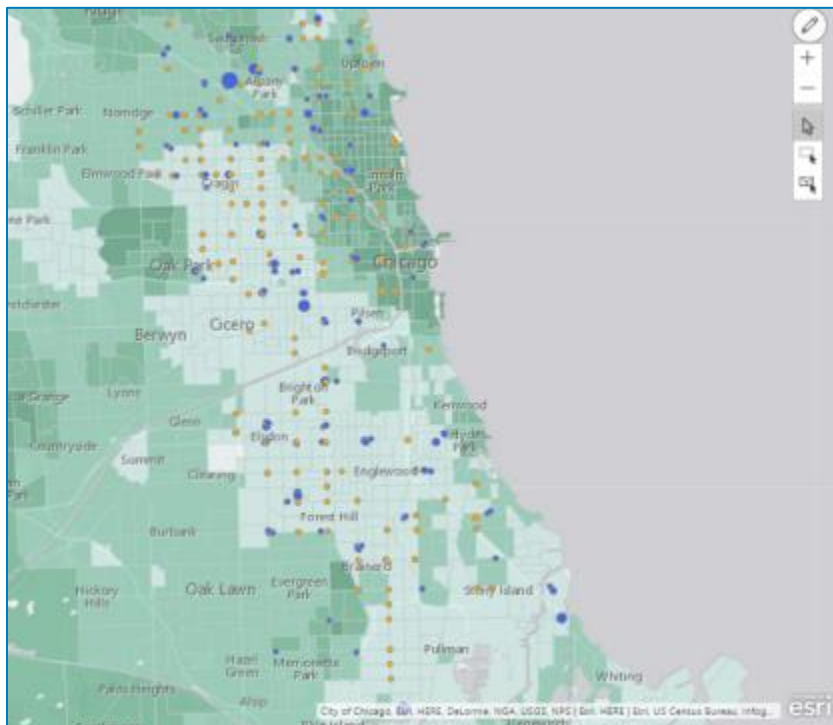
ArcGIS Maps also includes a *Plus* subscription for an extra monthly fee. More details are available from Esri's website: <http://www.esri.com/software/arcgis/arcgis-maps-for-power-bi>

### Pros

- Created and maintained by Esri, a leader in GIS software
- Various backgrounds / basemaps such as Dark, Light, OpenStreetMap, and Streets
- Options for drivetime and distance radii
- Option for clustering as you zoom in or out
- Option for heatmap
- Option for reference layers from ArcGIS Online
- Option for built-in infographics with data that updates as you move around the map

### Cons

- No ability to add custom shapes unless they are first added to ArcGIS Online and shared publicly, then used as a Reference Layer in Power BI
- Not available for embedding or Publish to Web
- Not available for Power BI Report Server



## Core: Shape Map

The *Shape Map* is a core visual for Power BI that displays polygon shapes on a blank background. It has several built-in geographies and allows users to import custom shapes using the TopoJSON format. Values are represented on the map using color scales and color saturation. TopoJSON is not a common format if you look for publicly available source files, but you can attempt to convert from other formats such as a Shapefile.

### Pros

- The only core map that currently allows custom geography in Power BI
- Can use with any type of 2D shape, not necessarily geographical

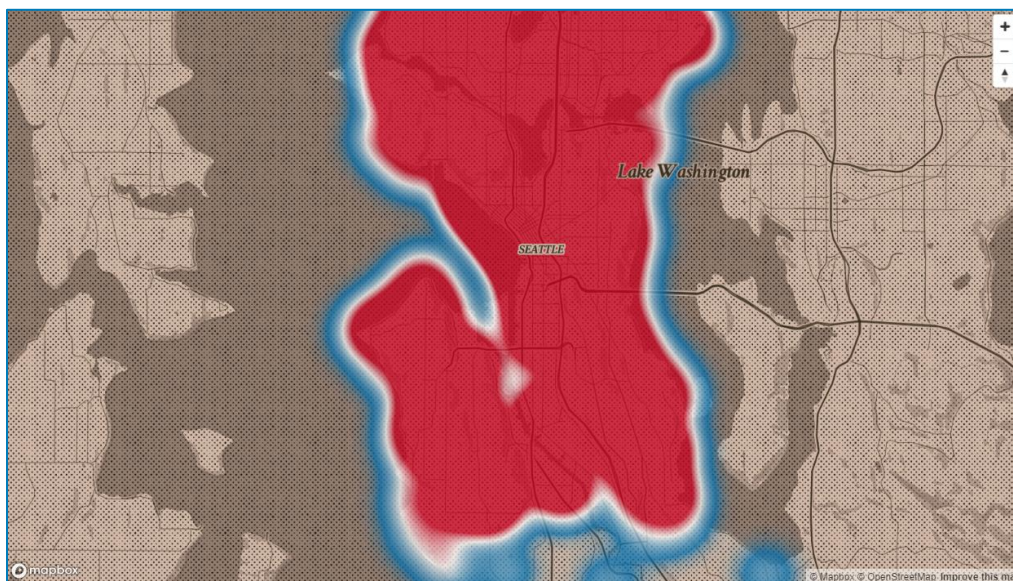
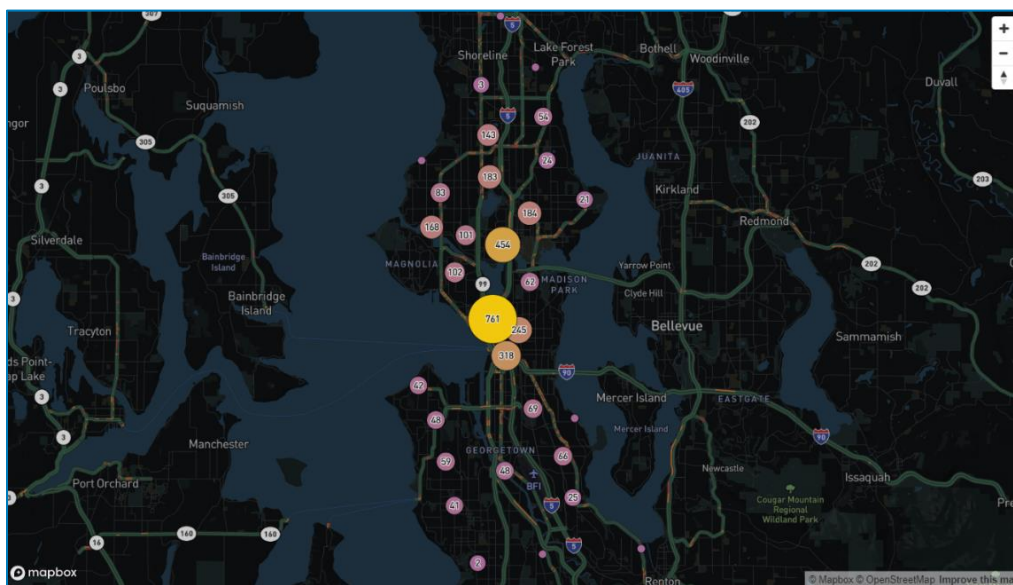
### Cons

- Still in Preview as of March 2018, so you must explicitly enable it in Power BI Desktop
- No option for a background / basemap to provide geographic context for the shapes
- No labels on the map itself, so you must hover over a shape and view the tooltip for details
- Only supports the TopoJSON format and not more popular or readily available formats like GeoJSON or Shapefiles
- Only renders polygon shapes and not points or lines
- Slow to load if you have a large, detailed TopoJSON file (approximately 1 MB or greater)



## Mapbox

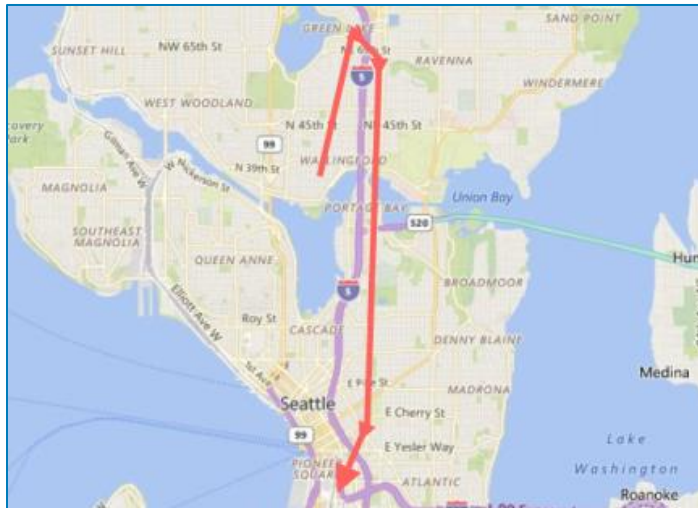
The *Mapbox Visual* is a custom visual created by Ryan Baumann of Mapbox. It uses the Mapbox GL library to render a versatile array of options. You can visualize your data as points, a heatmap, clusters, or choropleth. Background options include various Mapbox styles: **Dark**, **Light**, **Streets**, **Outdoors**, **Satellite Streets**, **Satellite**, **Traffic Light**, and **Traffic Dark**. You can also create your own custom styles using Mapbox Studio and bring them to Power BI. Use with Chrome or Firefox because IE, Edge, and Safari are currently not supported browsers. This visual requires a Mapbox access token. Mapbox has a free tier, pay-as-you-go, and commercial pricing. If you use the free tier, you have a limit of 50,000 map views per month. See the Mapbox site for more pricing details: <https://www.mapbox.com/pricing/>





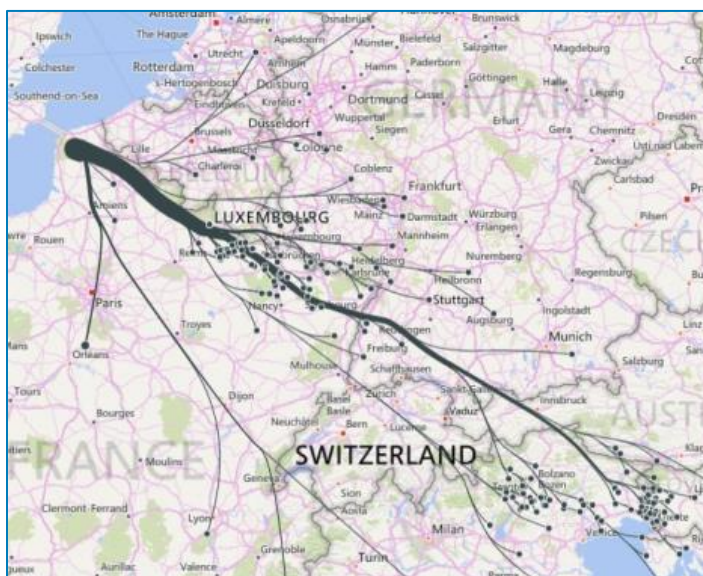
## Route Map

The *Route Map* custom visual was created by Weiwei Cui, an independent developer. It displays paths over time as lines between points on a map. It is a great option for showing movement along a route over time.



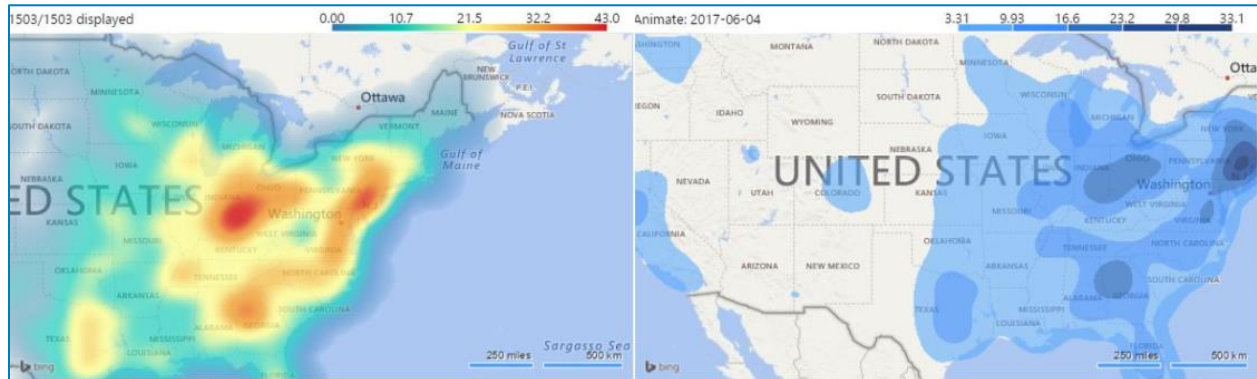
## Flow Map

Weiwei Cui also created the *Flow Map* custom visual. Like the *Route Map*, it is also a good way to show movement, or flow. Unlike the *Route Map*, it can display a complete network of points, or nodes, and show how movement converges to or diverges from these nodes.



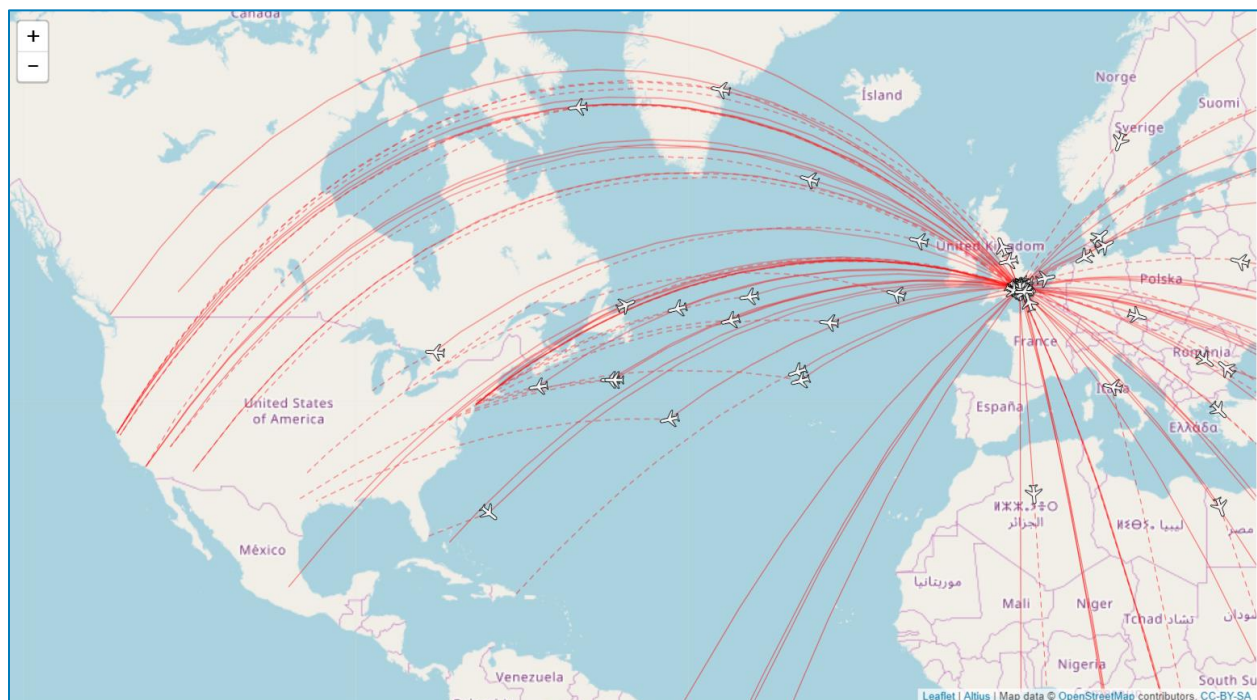
## Heatmap

The *Heatmap* is another custom visual created by Weiwei Cui. In addition to the default heatmap, this visual also offers a contour option. You also have several additional format options including the ability to animate through different views of the map.



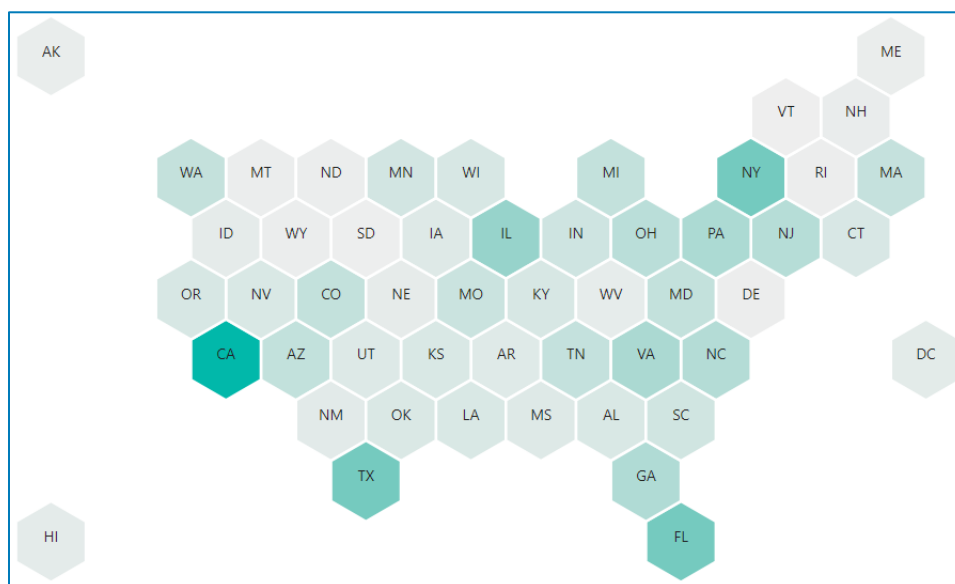
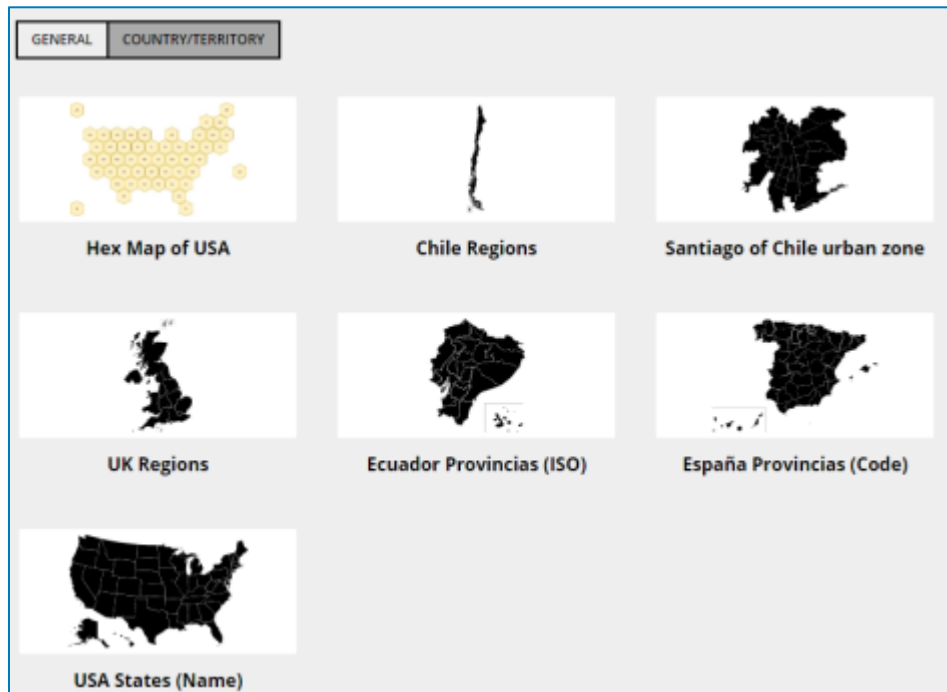
## Icon Map by Altius

The *Icon Map* custom visual by Altius is a dynamic, multi-use map based on the popular open-source Leaflet tool. It allows several different ways to represent your data including using icons as points, drawing lines, and more. You have several background layer options and can even use Mapbox or weather layers with the appropriate API keys.



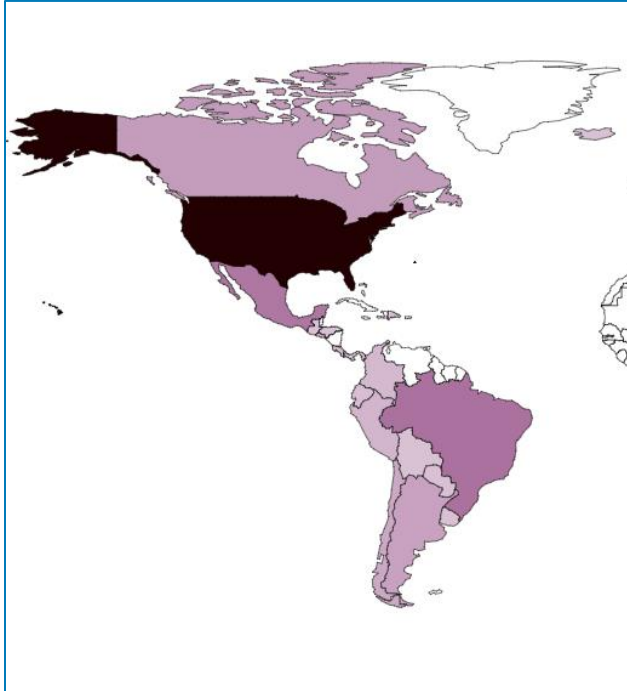
## Synoptic Panel by OKViz

The *Synoptic Panel* custom visual by OKViz allows for a broad and powerful range of different visualizations, one of which is for creating maps. It has a companion website (<https://Synoptic.Design>) that contains an editor and templates. For the latest version, always check the Synoptic Designer website. Developers designate areas on an image. When combined with your data, you create a custom choropleth map.



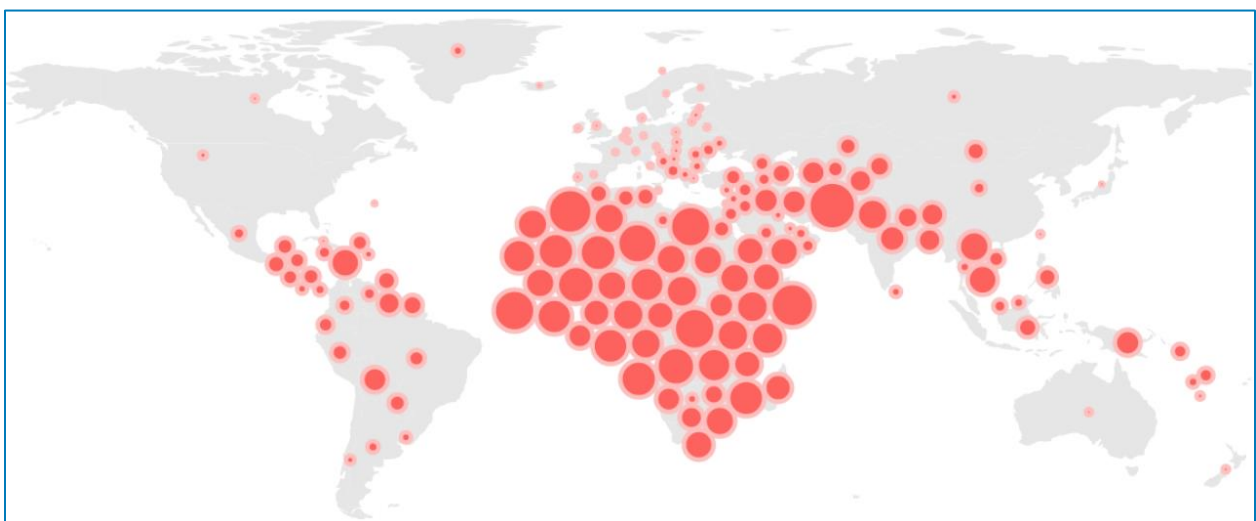
## Drilldown Choropleth

The *Drilldown Choropleth* custom visual uses color saturation to show values in different geographic areas. This map features up to three hierarchical levels of drilldown and custom TopoJSON backgrounds.



## Drilldown Cartogram

The *Drilldown Cartogram* custom visual uses point area to represent size. The specific type of cartogram used in this visual is called a Dorling Cartogram. Instead of overlaying bubbles, the cartogram packs them near each other without any overlap. It also attempts to preserve the general location by keeping it as close to the original point as possible. This map also features up to three levels of drilldown and custom TopoJSON backgrounds.



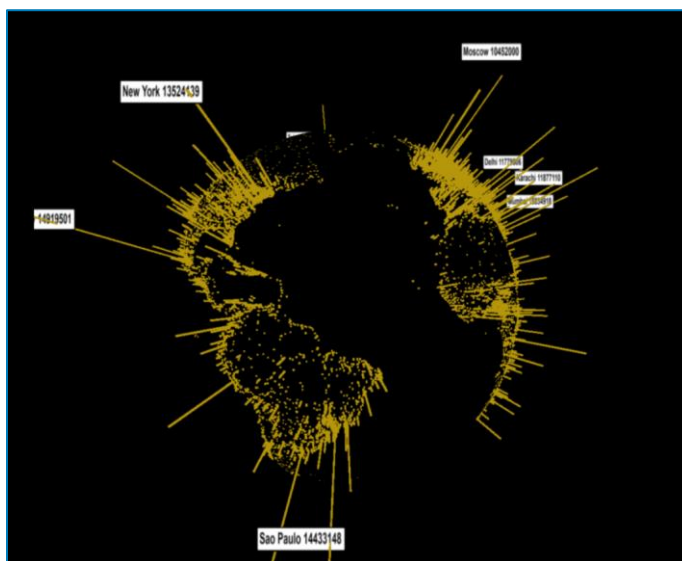
## Globe Map

The *Globe Map* custom visual displays values as bars or as a heatmap on a 3D globe. Users drag and rotate the map to view different locations. There is no way to view all worldwide data at once due to the map's 3D representation. Users may find this appealing at a high level, but geography does not render as well as you zoom in.



## Globe Data Bars

The *Globe Data Bars* custom visual is closely related to the *Globe Map*. It offers different ways to shade a 3D globe as well as a built-in control to limit the number of labeled location bars.



## Develop Your Own Custom Visual

If you are truly ambitious, you can consider creating your own custom visual in Power BI. If any of the prior methods to map data in Power BI are not suitable, and if you have the time and expertise, a custom visual can be a great way to display your geographic data. More information about creating custom visuals for Power BI is available in Microsoft's GitHub repository:

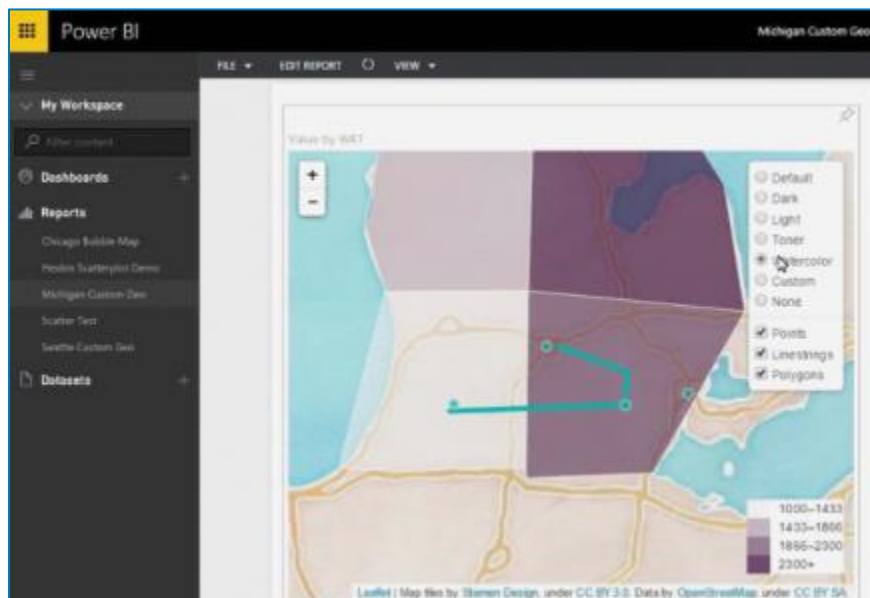
<https://github.com/Microsoft/PowerBI-visuals>

### Pros

- Extensive control over output
- Make use of popular JavaScript libraries such as Leaflet or Mapbox
- Incorporate custom geography using formats such as Shapefiles or GeoJSON

### Cons

- The most time-intensive option of all
- Difficult to use for anyone unfamiliar with TypeScript and JavaScript visualization libraries such as D3 or various mapping libraries



## Develop Your Own R Visual

The R language also offers an advanced platform for data visualization. If you want to go beyond the basics but also use R, Power BI provides two ways to create visuals with R:

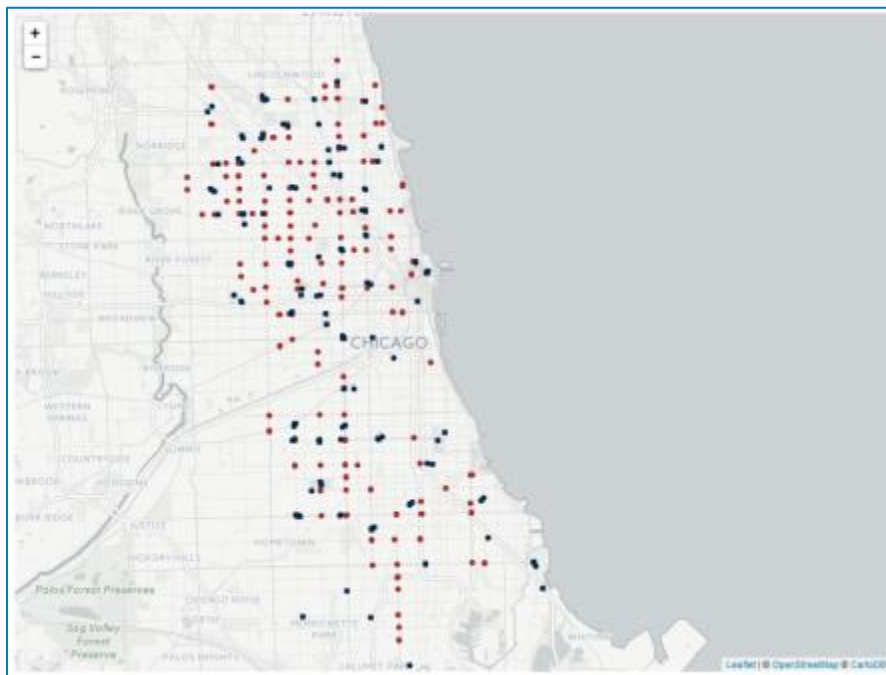
- 1) Create R visuals as static images directly in Power BI Desktop
- 2) Create static or interactive HTML R visuals as a custom visual

### Pros

- Extensive and detailed control over output
- Interactive HTML output is available by deploying as a custom visual
- Impressive output with little code relative to creating a standard custom visual
- Incorporate custom geography using formats such as Shapefiles or GeoJSON

### Cons

- Coding R visuals directly in Power BI Desktop requires a static image as output
- More difficult to use unless you are already familiar with R
- Not available for embedding or Publish to Web
- Not available for Power BI Report Server



## Summary of Options

The following table shows a consolidated view of each way of visualizing data in a map.

Map Name	Map Type	Author	Data	Power BI Service	Power BI Report Server	Publish to Web
Map	Core	Microsoft	Point	✓	✓	✓
Filled Map	Core	Microsoft	Area	✓	✓	✓
ArcGIS Map	Core	Esri	Point, Area	✓		
Shape Map	Core	Microsoft	Area	✓	✓	✓
Mapbox	Custom	Mapbox	Point, Area	✓	✓	✓
Icon Map	Custom	Altius	Point, Line	✓	✓	✓
Drilldown Choropleth	Custom	Microsoft	Area	✓	✓	✓
Drilldown Cartogram	Custom	Microsoft	Point	✓	✓	✓
Heatmap	Custom	Weiwei Cui	Area	✓	✓	✓
Flow Map	Custom	Weiwei Cui	Line	✓	✓	✓
Route Map	Custom	Weiwei Cui	Line	✓	✓	✓
Globe Map	Custom	Microsoft	Point	✓	✓	✓
Globe Data Bars	Custom	Jack Butts	Point	✓	✓	✓
Synoptic Panel	Custom	OKViz	Area	✓	✓	✓
Develop Custom Visual	Custom	n/a	Point, Area	✓	✓	✓
Develop R Visual	Custom	n/a	Point, Area	✓		

## AppSource Links to Custom Visuals

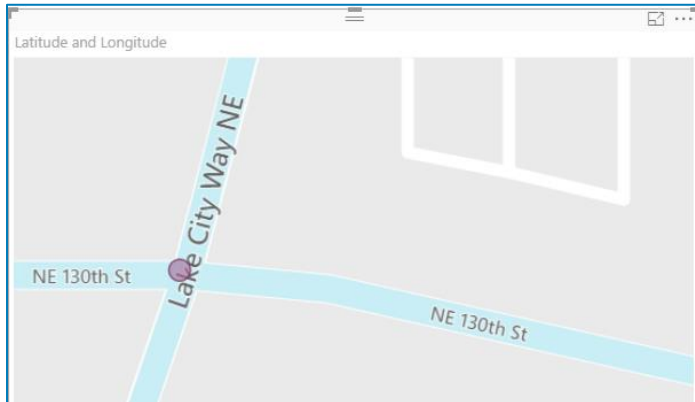
Find additional information about Power BI custom visuals on Microsoft AppSource.

Map Name	Link
Mapbox	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381472">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381472</a>
Icon Map	Not yet available on AppSource - <a href="https://www.altius.co.uk">https://www.altius.co.uk</a>
Drilldown Choropleth	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381044">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381044</a>
Drilldown Cartogram	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381045">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381045</a>
Heatmap	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381072">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381072</a>
Flow Map	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380901">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380901</a>
Route Map	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380985">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380985</a>
Globe Map	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380799">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380799</a>
Globe Data Bars	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381344">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104381344</a>
Synoptic Panel	<a href="https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380873">https://appsourc.microsoft.com/en-us/product/power-bi-visuals/WA104380873</a>



## Trivia: Bing StreetSide Available in Power BI

Microsoft's Bing Maps drives the *Map* and *Filled Map* in Power BI. Did you know that if you zoom in far enough on either map, you can use Bing's StreetSide view? Zoom in enough so that streets are highlighted in light blue, and then click on a street to enter StreetSide.



## Recommendations

Depending on your data and your audience, certain map options work better than others. As always, however, consider the needs of your audience first. Some maps may look good at a glance but may not make immediate sense to your viewers. In other cases, the level of detail in some maps may be appropriate if users have a chance to study a map, but it may be too much for a corporate setting. Additionally, some features such as 3D globes or pie charts on maps may be distracting for viewers or difficult to interpret. Ultimately, you want to design reports that work well from a data visualization perspective and which keep your audience happy at the same time.

Here are some final recommendations to use as guidelines:

- Prepare your data by cleansing it and setting data categories. Make your data as accurate as possible so that your visualization is as accurate as possible.
- When considering the background colors, avoid using data colors that are harder to see. Allow the data to be as distinct as possible without distracting your audience with a multi-colored background. If available, choose a grayscale or dark background to allow for a more diverse selection of data colors.
- If you need to represent more than a few thousand data points on a map, consider an aggregated view with the *Filled Map* or even the *Drilldown Choropleth* and *Drilldown Cartogram* custom visuals. Showing density as a cluster of overlaid points in the core *Power BI Map* does not work well.
- Only use a map if there is value in displaying locations on a map. Consider whether your data represents a simple categorical view and whether another visual such as a bar or line chart may be better for your audience in that circumstance.

## Conclusion

Microsoft Power BI offers many different ways to visualize your geospatial data. From a variety of maps to opting for no map at all, your goal is to help your viewers better understand how location may play a role in their analysis. While Power BI is not an advanced geographic visualization tool on par with software like Esri's ArcGIS, it caters to the general reporting needs of business users.

Creating maps for Power BI reports involves more than selecting a map type. Data preparation and proper data categorization play an important role in laying the foundation for accurate maps. Depending on the intended analysis, Power BI offers four core map visuals and numerous custom visuals from which to select. A plethora of formatting options to further customize maps vary per visual, and it is often beneficial to modify the default options so that your map stands out in a meaningful way.

Finally, the end result of creating a map should be the same as any other Power BI visual. Try to make it as straightforward as possible for your audience to understand the data.