

## TABLEAU Workshop

### Royal National Lifeboat Institute (RNLI)

Tableau is a data visualisation software that is used for creating a wide range of different visualisation to interactively present data and obtain insights. It has a very intuitive user interface and you don't need any coding knowledge to work with it.

For this tutorial we will be using Tableau Public which can be downloaded by navigating here <https://public.tableau.com/en-us/s/>

We will be creating a spider map or origin-destination map that shows paths between our origins (RNLI stations) and destinations (call-outs). All the data you will need for this tutorial is held in the Data folder within this repository.

Within this folder there is a CSV file called tableau\_finished and this was created using a combination of the RNLI\_Return\_of\_Service\_20082006.csv and RNLI\_Lifeboat\_Station\_Locations.csv.

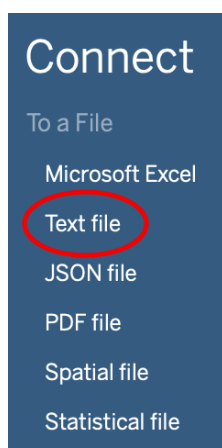
There are several ways to create spider maps in Tableau and for the purpose of creating this map, our data source needed to contain the following information:

- An ID that tells us if the row is the station or call-out
- A Path ID for every unique path
- Latitude and longitude coordinates for every location

For this type of spider map, there should also be two rows in your data source for each path. That means you should have one row for your origin location data, and one row for your destination location data, repeated for every path. This is a crucial step that enables Tableau to draw your paths correctly.

To understand this a little better let's load the CSV file into Tableau

> Open Tableau and click on Text file



> Browse to the CSV file named tableau\_finished > click Open

> In the window that has just opened you should be able to see your CSV files column headers but no data. To load some data, change the value in the rows box to 10

> Click Update Now

Sort fields

Data source order

☐

Show aliases

☐

Show hidden fields

10

⇒

rows

Abc	Abc	Abc	+	+	📅	#	Abc	+	Abc
tableau_finshed.csv	tableau_finshed.csv	tableau_finshed.csv	tableau_finshed.csv	tableau_finshed.csv	tableau_finshed.csv	tableau_fini...	tableau_finshed.csv	tableau_finshed.csv	tableau_finshed.csv
Origin-Destination	Station	Path ID	Longitude	Latitude	Launchtime	Year	Aic	County	Region
destination	100	ABERDEEN_100	-2.0962000	57.1297000	30/12/1899 09:30:00	2016	Motor vehicle activity	Aberdeenshire	Scotland & No
origin	ABERDEEN	ABERDEEN_100	-2.0804307	57.1440391	30/12/1899 09:30:00	2016	Motor vehicle activity	Aberdeenshire	Scotland & No
destination	10171	ABERDEEN_10171	-2.0876000	57.1332000	30/12/1899 19:43:00	2009	Person in distress	Aberdeenshire	Scotland & No
origin	ABERDEEN	ABERDEEN_10171	-2.0804307	57.1440391	30/12/1899 19:43:00	2009	Person in distress	Aberdeenshire	Scotland & No

Within this table you can now see how our CSV is structured.

### The Station column

For each unique path you want to create, you need a row for your origin location, and a row for your destination location in your data source. This means your origin location will be paired with every destination location.

For example, when showing the path between an origin station location and several call-out destination locations, you need a row for the origin location, and a row for the destination location for *every single path*.

In our CSV above, the origin station Aberdeen is paired with two different destination locations (ABERDEEN\_100, ABERDEEN\_10171) to show that for Aberdeen we have two different call-out locations. There is a column for Origin-Destination to further illustrate this concept, but this column is not required.

### The Path ID column

The Path ID column is used to identify each unique origin-to-destination path. You will use this column to create your spider map.

For each origin and destination location, there is a unique key or string that identifies them as a pair.

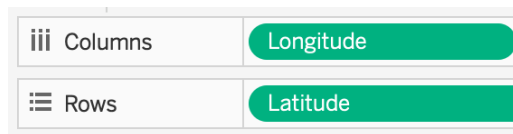
In our CSV, for the first origin-destination path, the Path ID is ABERDEEN\_100 and for the second origin-destination path, the Path ID is ABERDEEN\_10171. Each path ID is listed twice, once for the origin location, and once for the destination location. As our destination location has no name we generated a numerical field (100,10171 etc.) based on its row position within the CSV. We then used this value within the Station column for our destination name.

> Click on New Worksheet (found in the bottom left corner)



The first thing to do is visualise our point data from our CSV file onto a map. We do this using the longitude and latitude fields from our data.

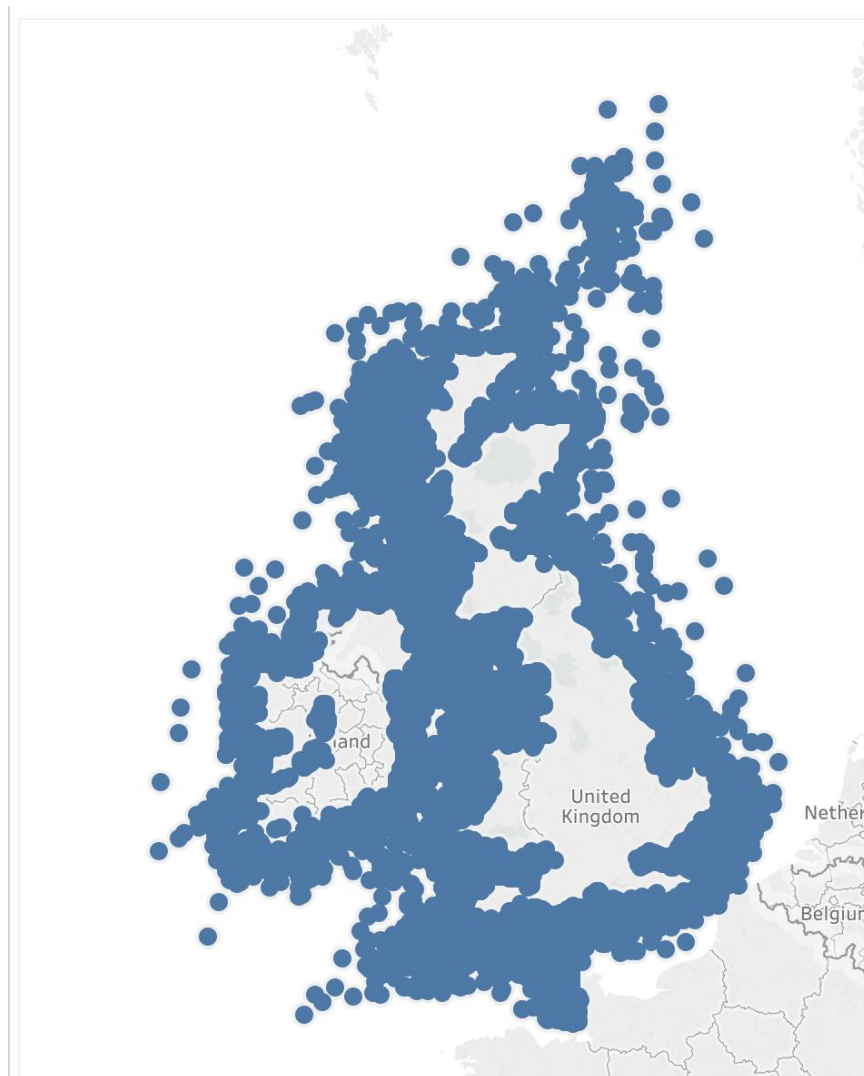
> From the Measures box (bottom left) drag Longitude to the Columns shelf and Latitude to the Rows shelf



> On the Columns shelf, right-click the Longitude field and select Dimension

> On the Rows shelf do the same

This will make sure Tableau does not aggregate your origin and destination locations.



This is now showing us all the locations in the data source as points on our map. There is a data point for every RNLI station and call-out location

By default, Tableau uses OpenStreetMap as its backdrop mapping, but we can change this. We recently released OS Open Zoomstack which gives users access to a comprehensive vector basemap showing coverage of Great Britain at a national level, right down to street level detail.

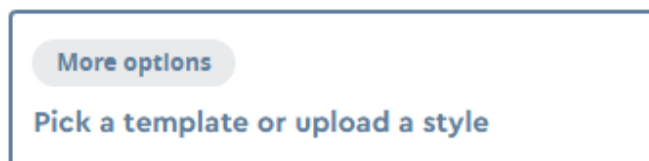
This data can be served through Mapbox (an open source mapping platform for building custom designed maps) as vector tiles and this in turn can be read by Tableau. I have already created a map style using the OS Open Zoomstack vector tiles and this can be uploaded to your Mapbox account for use with this tutorial. If you do not have a Mapbox account, you will need to set one up and details on how to do this can be found by navigating here

<https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf>

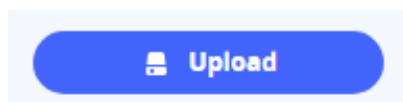
> Open Mapbox and click on Studio



> Click on Pick a template or upload a style



> Click on Upload



> The map style is called style2.json and can be found [here](#).

JSON is short for JavaScript Object Notation and is a way to store information in an organised, easy-to-access manner. In a nutshell, it gives us a human-readable collection of data that we can access in a logical manner.

> Open the file. The map style should now be visible in your Mapbox window and is called OS Outdoor-RNLI

> Next click on the back arrow next to your style header



> Click on the Menu button next to your style and click Make public



**OS Outdoor-RNLI**

Saved on Oct 3, published on Oct 1 • Public ●

**Share & use**

**Menu** ☰

Now we have our map style loaded into Mapbox we can add it as our base map within Tableau.

> Click on Map from the top Tableau menu

> Select Background Maps > Map Services...

> In the Map Services box that appears click Add...

**Add...**

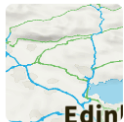
> Select Mapbox Maps...

We now need to populate the Url field with our Mapbox style Url.

> Navigate back to your Mapbox account

> Click on Studio

> Next to your OS Outdoor\_RNLI style click on Share & Use



**OS Outdoor-RNLI**

Saved on Oct 3, published on Oct 1 • Public ●

**Share & use**

**Menu** ☰

> From the window that appears make sure your style is set to Public and click on Use

## OS Outdoor-RNLI

Saved on Oct 3, published on Oct 1 • Public •

Share **Use**

### Share URL

<https://api.mapbox.com/styles/v1/geodataviz/cjmq7560x6p7...>



Anyone can view the published version of this style by visiting this URL.

Private

**Public**

By default your style is private. Setting public allows other users to copy this style into their account and any draft of your style will automatically be published.

> From the menu on the left-hand side select Third party and then Tableau from the middle menu

Web

iOS

Android

Unity

**Third party**

WMTS

ArcGIS Online

CARTO

**Tableau**

Fulcrum

### Integration URL

<https://api.mapbox.com/styles/v1/geo...>



In Tableau, click **Map > Background Maps > Map Services > Add > Mapbox Maps**. Then paste in the share URL above. This feature is available in Tableau 9.3 and above.

> Copy the URL or use the clipboard button

> Navigate back to Tableau and paste the URL into the Url field. Give your style a name

Add Mapbox Map

Mapbox GL Classic

Style name: OS Outdoor-RNLI

Adding a Mapbox GL map requires a style URL OR filling out the API token, Username, and Layer ID.

Url: 6.084541/-3.567304/347

API access token: VVqnOpZ0Yz134UMnp6Yw

Username: geodataviz

Layer ID: mq7560x6p7e2rlcb1sdtg

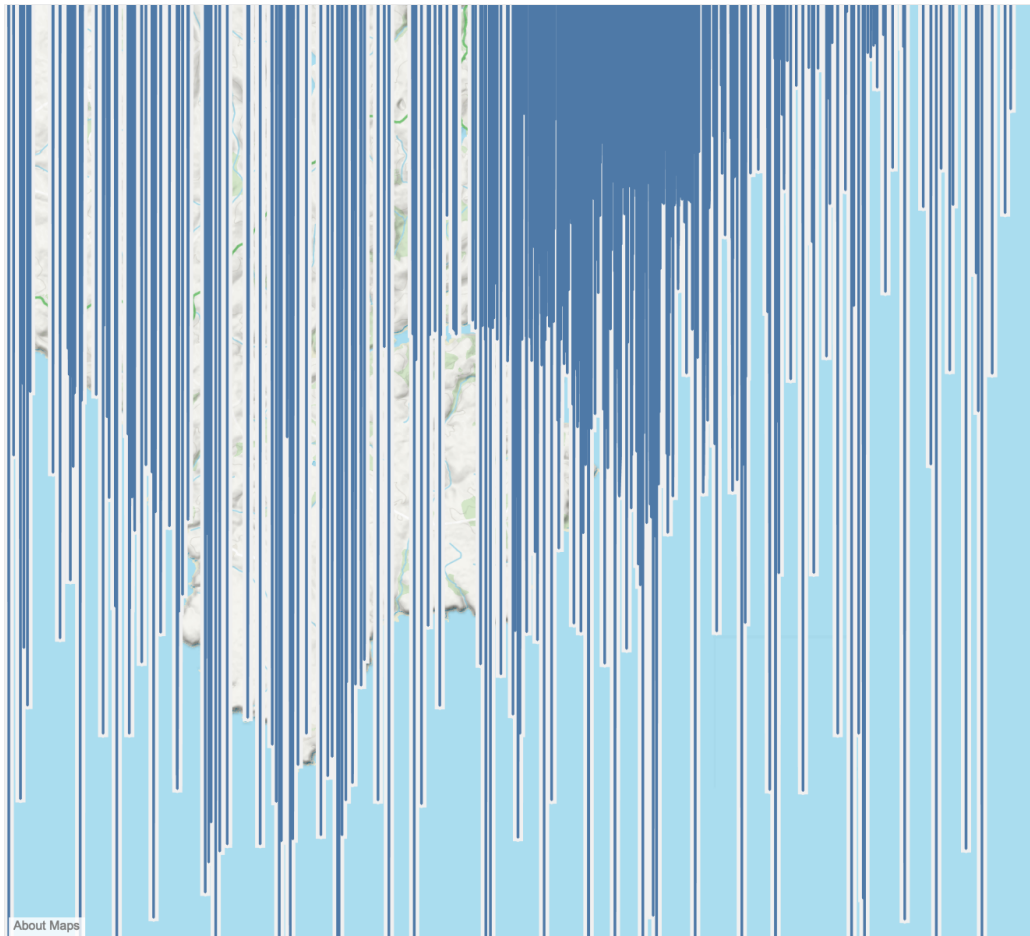
[About Mapbox maps](#) Cancel OK

> From the Map Services box click close

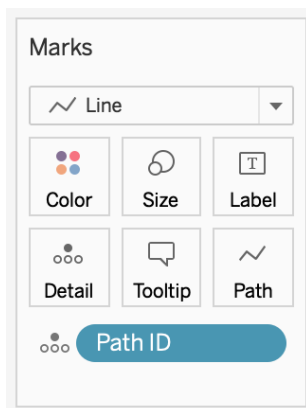
Your base map should now have changed to our OS Open Zoomstack data using the style we applied in Mapbox.

Try navigating around the map using the pan and zoom functionality within Tableau.

> On the Marks card, click the Marks drop-down, and select Line. Your data should update depicting a line connecting each data point. Looks a bit of a mess!



> From Dimension, drag Path ID to the Marks card



Your map view should now look something like the following:



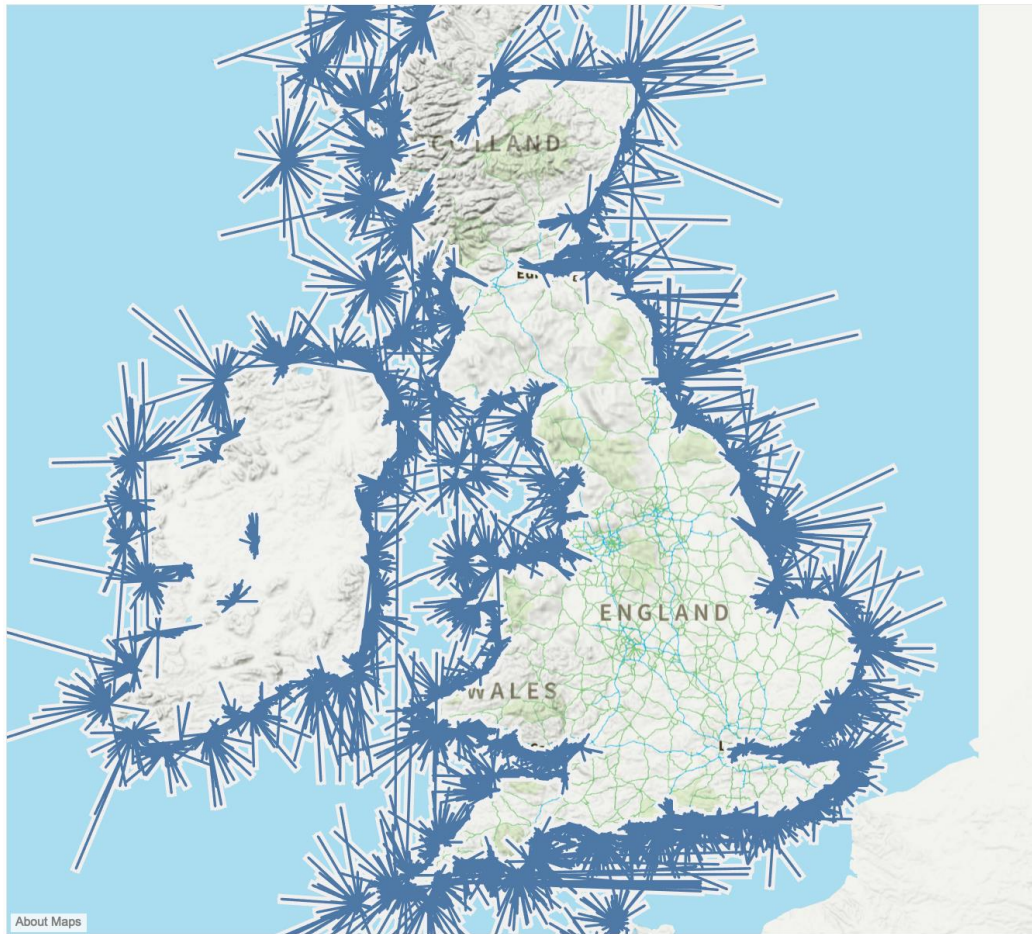


Tableau uses the Path ID field to identify which points share a common attribute which in our case is the RNLI station. It then draws a line from this station point location to each of the call-out location points that share that common attribute.

Next, we can create a dynamic filter which will allow us to select an individual station so only it and its call-out locations are visible in our map window.

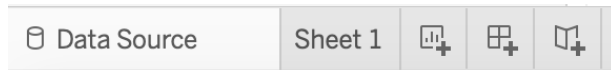
The first thing we need to do is add another CSV file which will use later.

> Click on the Tableau icon which can be found in the top left of your screen

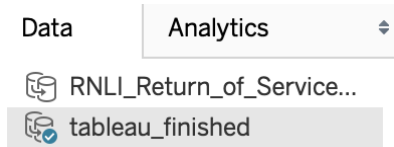


> Click on Text file and browse to the location of our RNLI\_Return\_of\_Service\_20082006 CSV file > click Open

> Return to your Tableau worksheet by clicking on the worksheet found next to the Data Source box at the bottom left of your screen. This will probably be called Sheet 1 or Sheet 2. You can rename this if you wish by right-clicking and selecting Rename



> Make sure that under the Data pane you have tableau\_finished highlighted as your data source



> From the Dimensions pane drop-down select Create Parameter...



> In the Create Parameter dialogue box, do the following:

- Change the name to StationSelected.
- Change Data type to String
- For Allowable values, click List > select Add from Field
- Select the CSV RNLI\_Return\_of\_Service\_20082016 > select the Lifeboat Station Name Proper field.
- Click OK

**Edit Parameter [StationSelected]**

Name:  Comment >>

**Properties**

Data type:

Current value:

Display format:

Allowable values: ☐ All ☒ List ☐ Range

**List of values**

Value	Display As
ABERDEEN	ABERDEEN
ABERDOVEY	ABERDOVEY
ABERSOCH	ABERSOCH
ABERYSTWYTH	ABERYSTWYTH
ACHILL ISLAND	ACHILL ISLAND
AITH	AITH
ALDEBURGH	ALDEBURGH
ALDERNEY	ALDERNEY
AMBLE	AMBLE

Add from Parameter ►  
Add from Field ►  
Paste from Clipboard  
Clear All

Cancel OK

> From the top Tableau menu select Analysis > Create Calculated Field

> In the calculation editor, name the calculated field Select by Origin-Destination

> Enter the following formula:

**IF**

**LEFT([Path ID], FIND([Path ID], "\_" ) -1) = [StationSelected] THEN "Origin"**

**ELSEIF**

**RIGHT([Path ID], LEN([Path ID]) - FIND([Path ID], "\_")) = [StationSelected] THEN  
"Destination"**

**ELSE**

**"Unselected stations"**

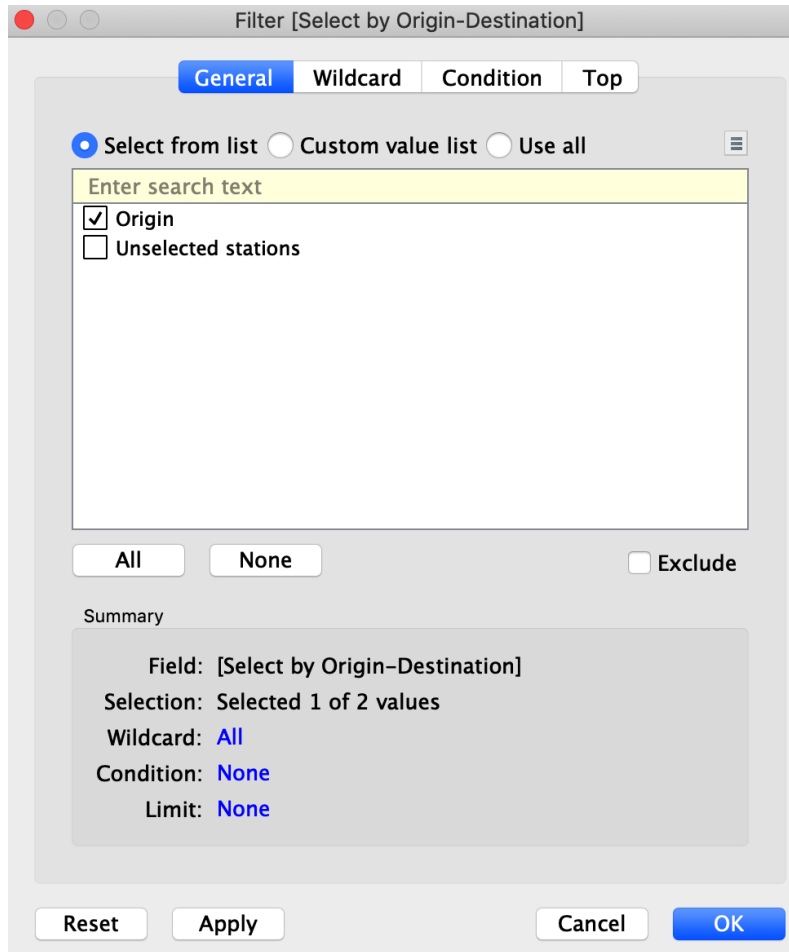
**END**

In the formula above, each Path ID (for example ABERDEEN\_100) contains an underscore ( \_ ) as a delimiter to separate the origin location name (ABERDEEN) from the destination location name (100). This delimiter is used in the formula to tell Tableau which locations are origin locations, and which are destination locations.

> Make sure the calculation is valid, and click OK

> From Dimensions, drag the calculated field (Select by Origin-Destination) to the Filters shelf.

> In the Filter dialogue box, Select Origin and then click OK



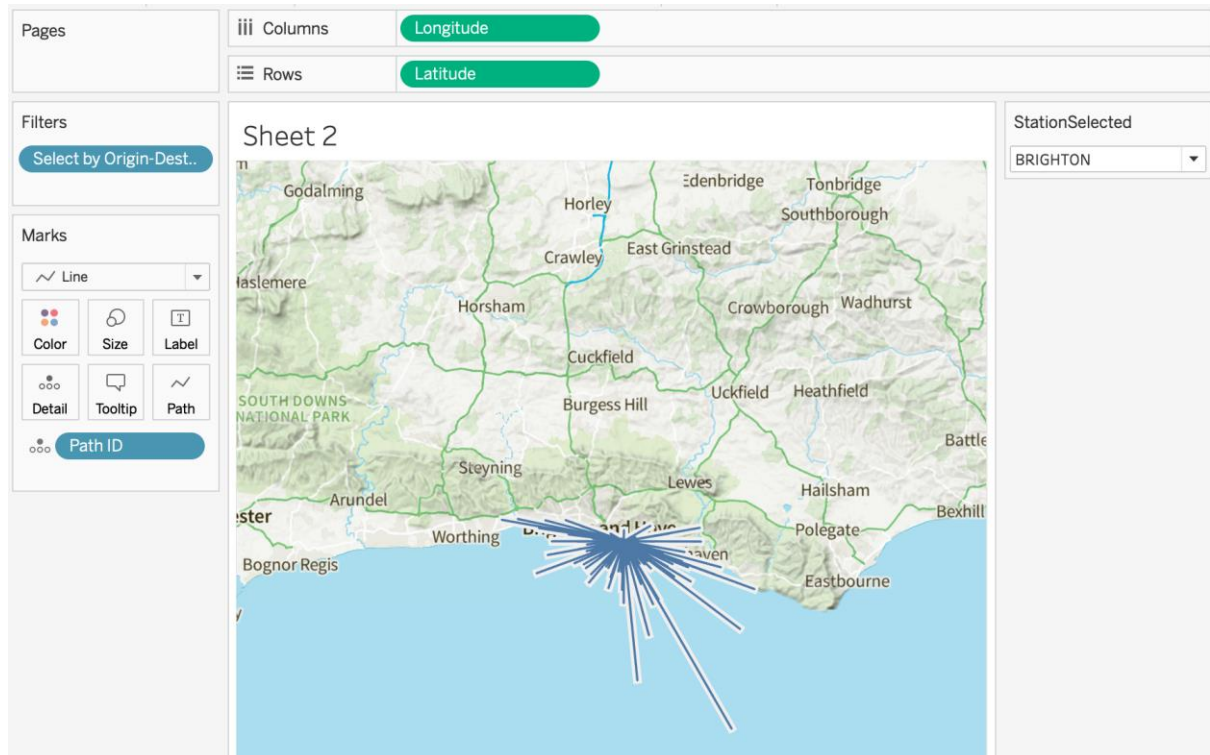
> Under Parameters click the StationSelected parameter drop-down



> Select Show Parameter Control

You will now be able to select an RNLI Station from the StationSelected drop-down on the right-hand side and the map window will update accordingly.

Next, we can start to look at adding some styling to our data to make it easier to interpret.

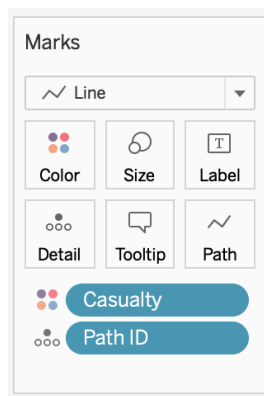


> Under the Marks card click on Size and reduce the width of your lines

> Click on Colour and under the Halo drop-down click None

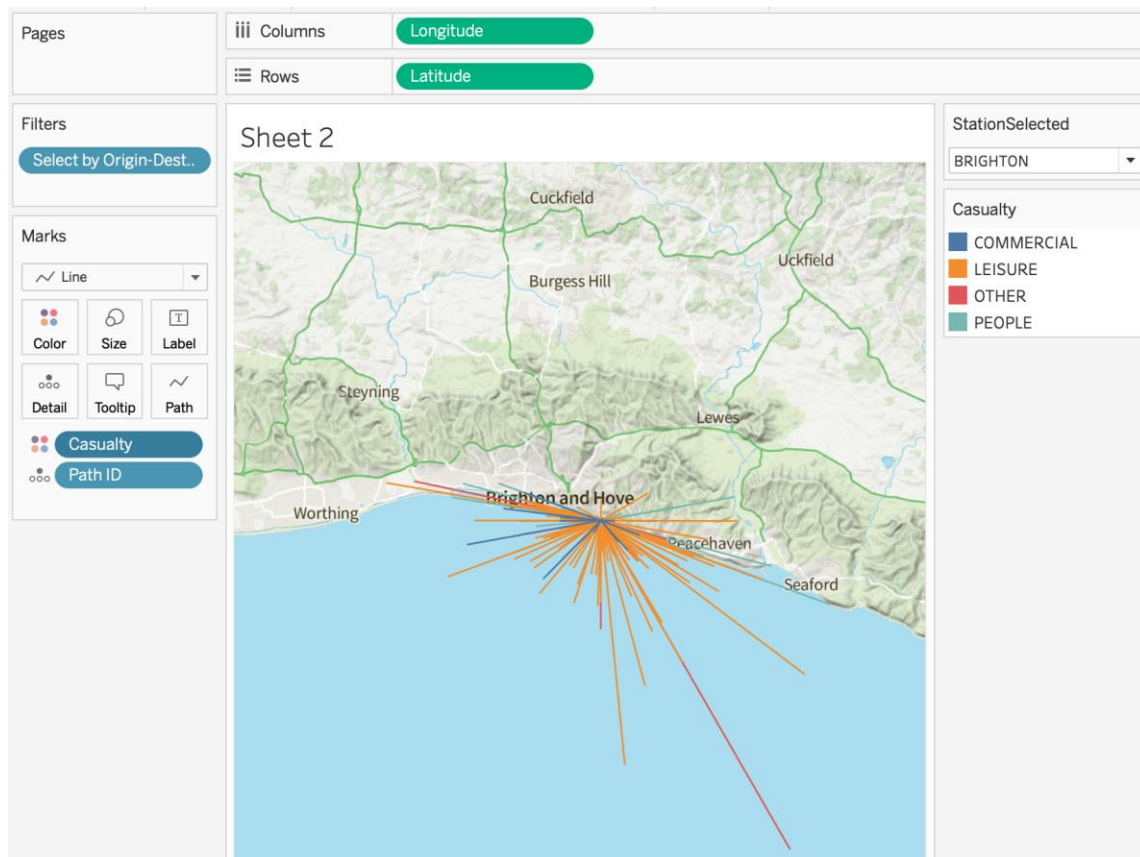
Next, we are going to colour our lines based on one of the attributes within our data

> From Dimensions, drag the Casualty field to Colour on the Marks card



> Feel free to change the assigned colours by clicking on Colour within the Marks card and selecting Edit Colours... You can assign each colour manually or choose one of the Tableau palettes from the drop-down.

> Under Colour change the opacity of your lines to 25% and make sure your lines markers are set to Automatic



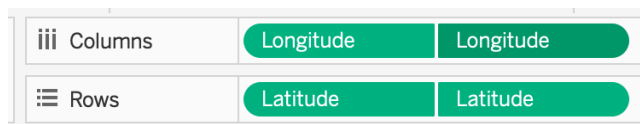
Next, lets add a point to represent each of the call-out locations which will be colour coded to match our lines

> From the Measures box drag Longitude to the Columns shelf and Latitude to the Rows shelf. This is basically allowing us to visualise the point data from our data source twice.

> Right click on Longitude (far right) > select Dimension > select Dual Axis

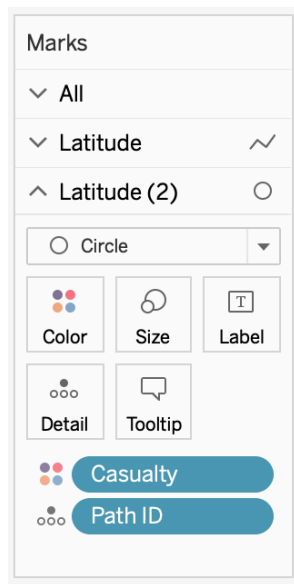
> Right click on Latitude (far right) > select Dimension > select Dual Axis

This tells Tableau this data is spatial and that we want it to appear on the same map



> Under your Marks card you should have a Latitude layer (our original line data) and Latitude(2) which at the moment is a direct duplication this layer

> Select Latitude(2) from the Marks card and change the drop-down to circle



> Increase the radius of your circles and change the opacity to 100%

Next, lets add another filter based on the Outcome field within our data. This field allows us to visualise our data based on the outcome of each call and includes whether the call was a false alarm or not.

> From the Dimensions box drag Outcome to the Filters card

> From the Filter dialogue box select the data attributes that you would like available through the filter.

Filter [Outcome]

General Wildcard Condition Top

☒ Select from list ☐ Custom value list ☐ Use all

Enter search text

- ☒ False alarm
- ☒ Hoax call confirmed
- ☒ Hoax call suspected but unconfirmed
- ☒ No service - lifeboat unsuitable
- ☒ Others assisted casualty
- ☒ Rendered assistance
- ☒ Resolved unaided
- ☒ Unsuccessful search

All None ☐ Exclude

Summary

Field: [Outcome]  
 Selection: Selected 8 of 8 values  
 Wildcard: All  
 Condition: None  
 Limit: None

Reset Apply Cancel OK

> Select OK

> Within the Filters card click on the Outcome filter drop-down and select Show Filter

Your Outcome filter should now be visible on the right-hand side of your page

Outcome

- ☒ (All)
- ☒ False alarm
- ☒ Hoax call confirmed
- ☒ Hoax call suspected but unconfirmed
- ☒ No service - lifeboat unsuitable
- ☒ Others assisted casualty
- ☒ Rendered assistance
- ☒ Resolved unaided
- ☒ Unsuccessful search

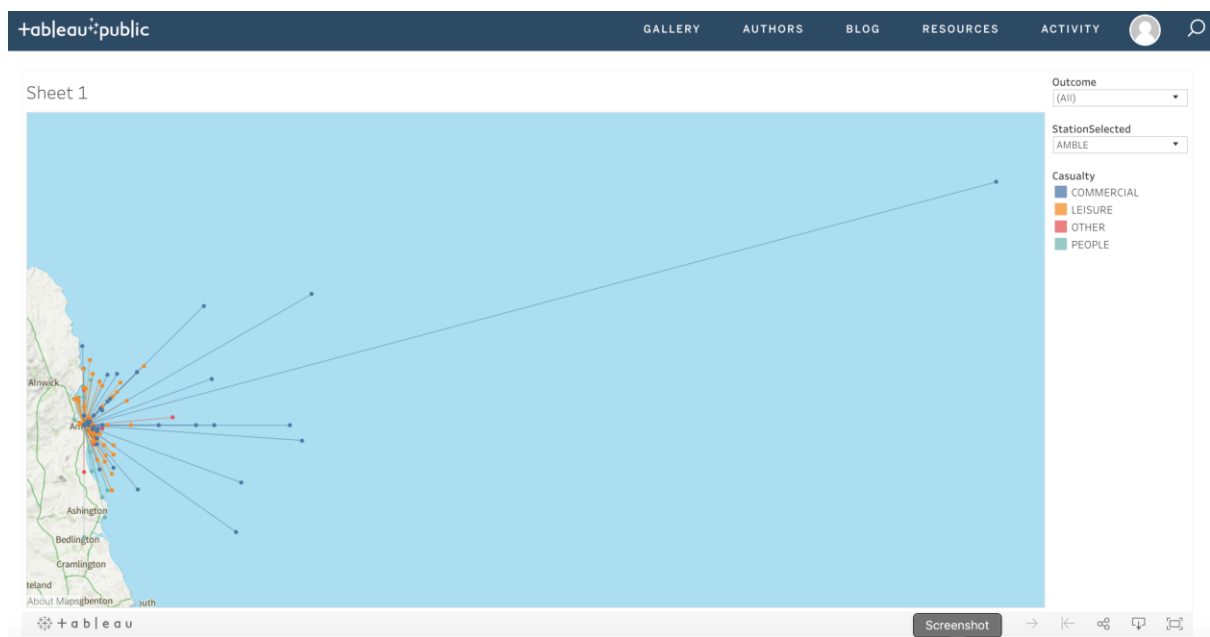
> Turn it into a drop-down menu by clicking on the Outcome filter drop-down and selecting Single Value (dropdown)



You have made an interactive map based on Ordnance Surveys Open Zoomstack and RNLI's Station and call-out locations. The map allows you to zoom to each RNLI Station and view each if its call-outs which have been coloured based on the type of casualty associated with each call. Using another drop-down you are also able to filter your data further based on the outcome of each of the call-outs.

We can share this data by saving our worksheet to Tableau Public. This will give you a URL you are then able to share.

> Click File > Save to Tableau Public As...



Feel free to check out my version by navigating here

<https://public.tableau.com/profile/cartocraftsman#!/vizhome/RNLIv2/Sheet1?publish=yes>

> You can return to this map within Tableau at any point by opening Tableau > File > Open from Tableau Public