

# Maps in R with ggmap

R4All 2016



**Remember to install and load  
ggmap...**

# ggmap works with ggplot to make maps

1. Get a map from an online source  
(or provide your own map)
2. Plot using ggmap (instead of ggplot)
3. Add extra layer just like with ggplot.

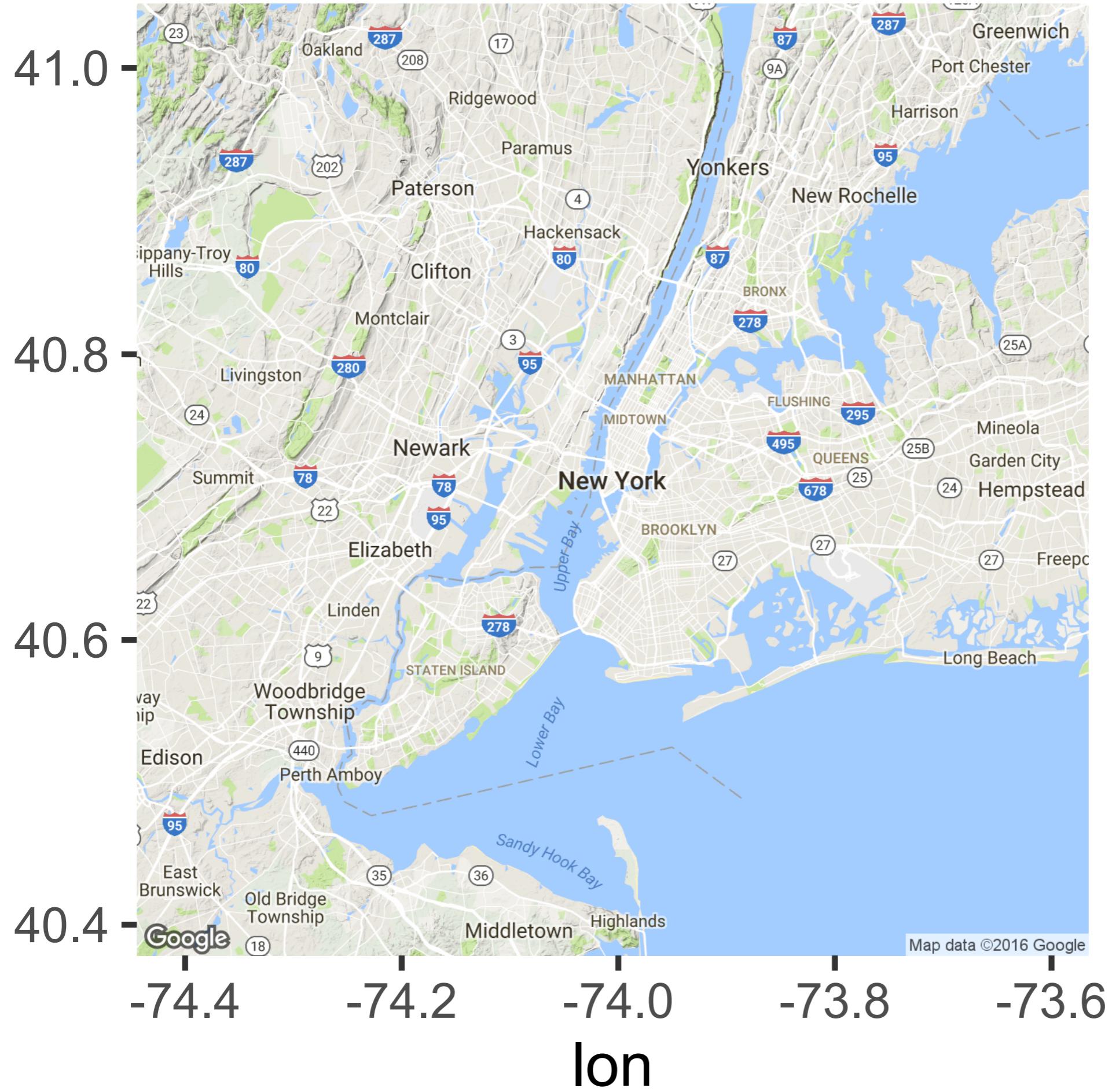
First you need to get a map...  
[needs internet]

```
mymap <-  
get_map(location = "New York")
```

# Then you can plot it!

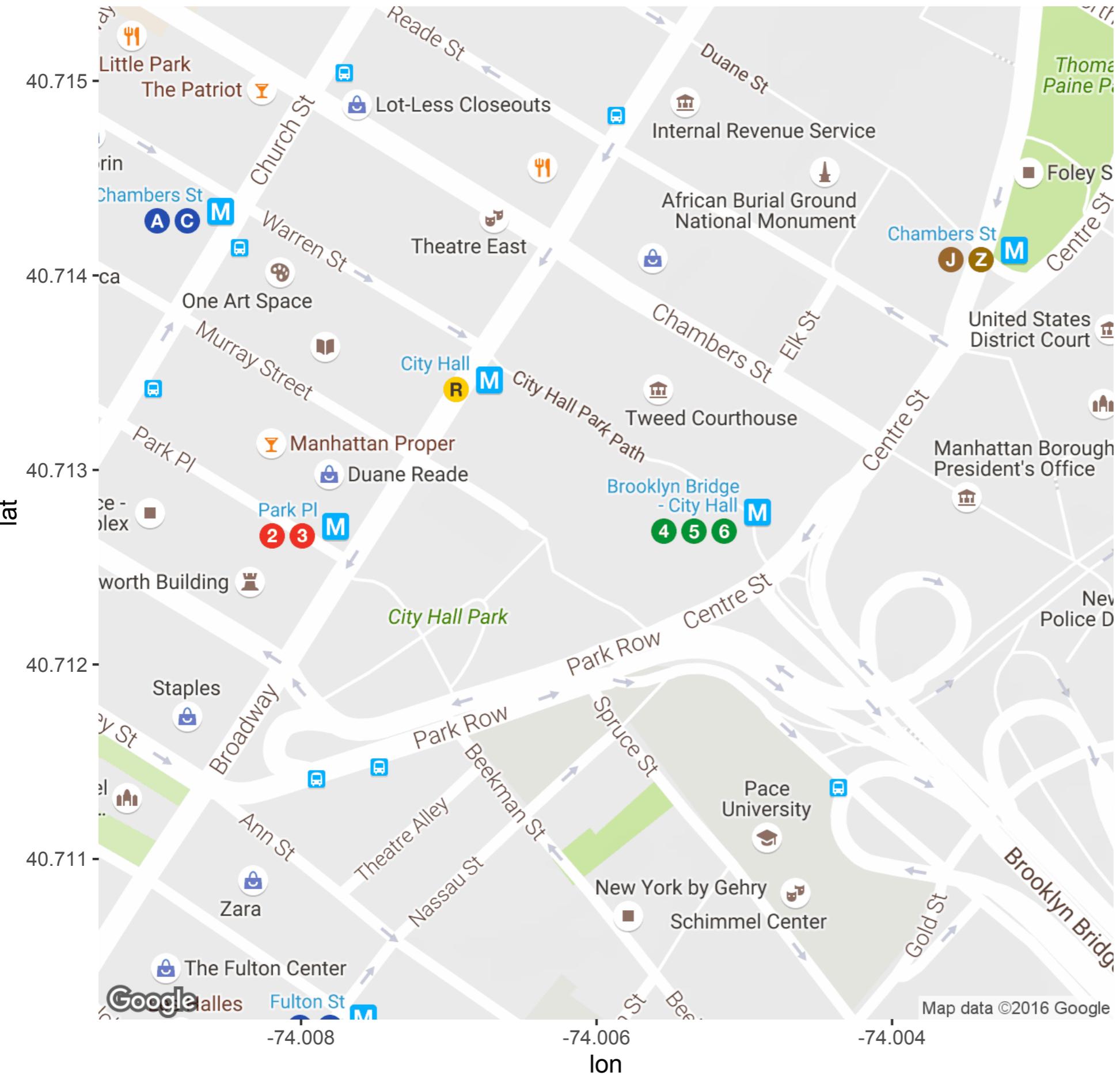
```
ggmap(mymap)
```

# What are x and y variables?



# getmap has lots of options [needs internet]

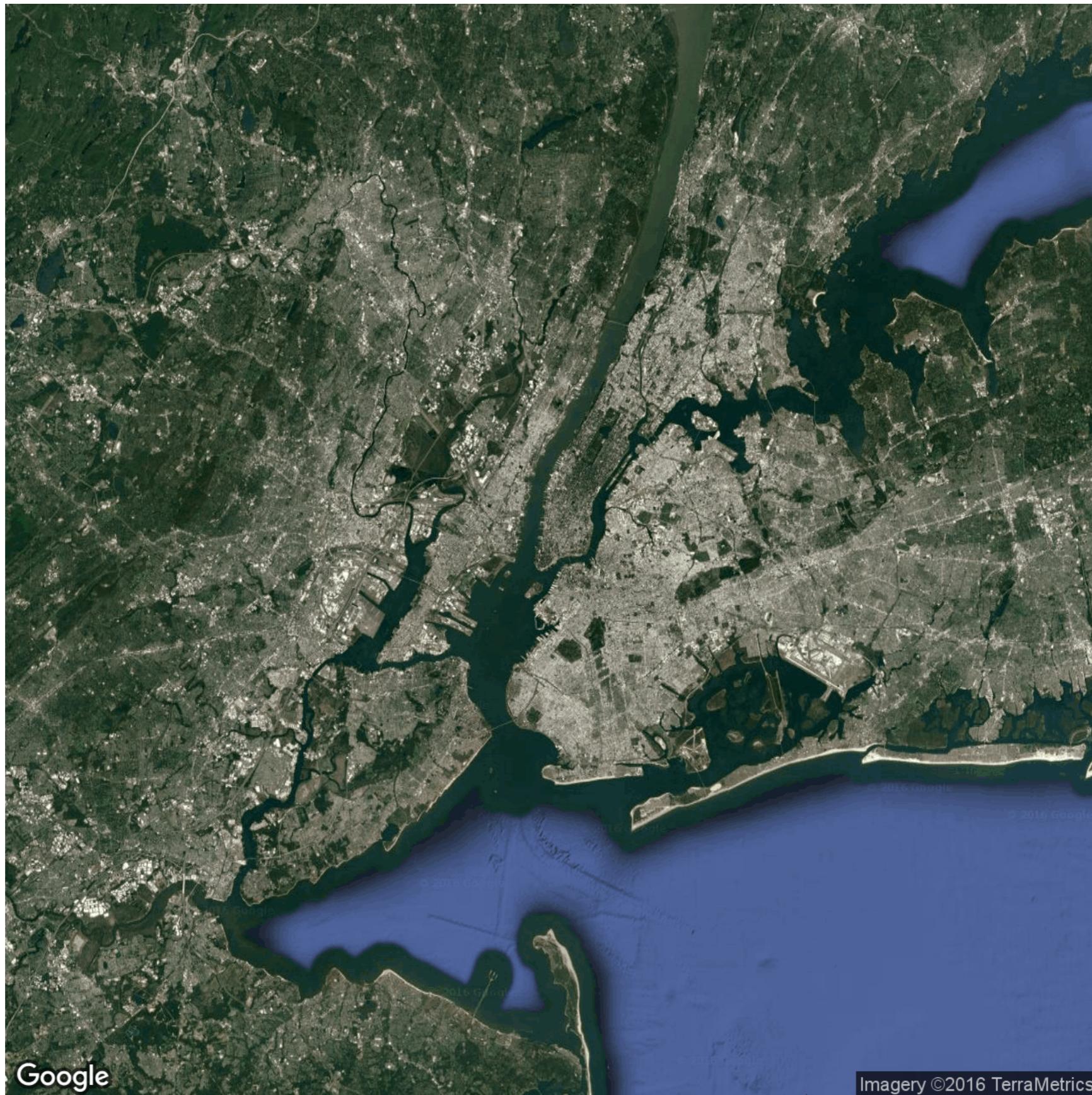
```
mymap <-  
get_map(location = "New York",  
zoom = 17)  
  
ggmap(mymap)
```



# getmap has lots of options [needs internet]

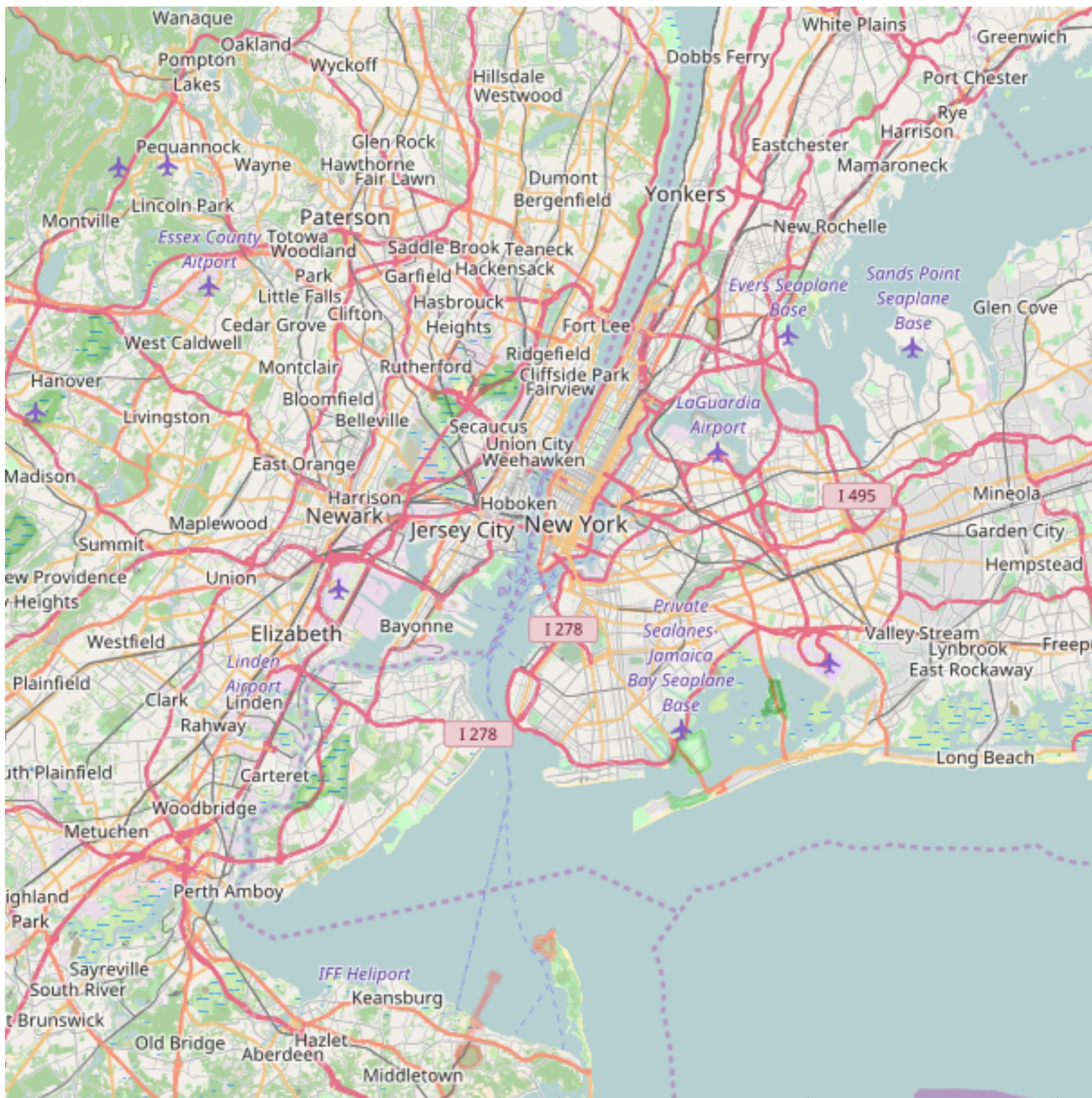
```
mymap <-  
get_map(location = "New York",  
maptype = "satellite",  
zoom = 10)  
  
ggmap(mymap, extent = "device")
```

what does this do?



# getmap has lots of options [needs internet]

```
mymap <-  
get_map(location = "New York",  
source = "osm",  
maptype = "roadmap")  
  
ggmap(mymap, extent = "device")
```



# getmap can use postcodes [needs internet]

```
mymap <-  
  get_map(location = "SW7 5BD",  
  maptype = "satellite",  
  zoom = 17)  
  
ggmap(mymap, extent = "device")
```



Google

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getmap can use lat long data  
[needs internet]

```
mymap <-  
  get_map(location = c(lon =  
    2.2945, lat = 48.8584),  
  maptype = "satellite",  
  zoom = 17)  
  
ggmap(mymap, extent = "device")
```



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# Look at the help file ?get\_map

- Where can you get maps from?
- What map types can you use?
- What do the different zooms do?
- Find your house, or your workplace
- To plot use **ggmap (mymap)**

# Adding extra things to maps

- Works just like ggplot, and uses the same geoms (`geom_point`, `geom_line`)
- First layer is your **ggmap layer** (not the ggplot layer).
- Rest of the layers are added after +

# Adding points

First get a map of London...

```
mapLondon <- get_map(location  
= "London Bridge",  
color = "color",  
source = "google",  
maptype = "satellite",  
zoom = 13)
```

# Decide what to add...google!

Google lat long st paul's cathedral

All Maps Images News Videos More ▾ Search tools

About 85,200 results (0.84 seconds)

St Paul's Cathedral / Coordinates

51.5138° N, 0.0984° W



Feedback

[St. Paul's cathedral london latitude and longitude - Distance From www.distancesfrom.com/St.-Pauls-cathedral...latitude-longitude-St.-Pauls-cathedral...I... ▾](#)

Find latitude longitude of St. Paul's cathedral london. St. Paul's cathedral london latitude and longitude. Add this Lat-Lng to your website!

# Adding points

## Then plot and add the point...

```
ggmap(mapLondon, extent = "device") +  
  geom_point(aes(x = -0.0984, y =  
  51.5138), alpha = 0.5, color =  
  "deeppink", size = 10, pch = 16)
```

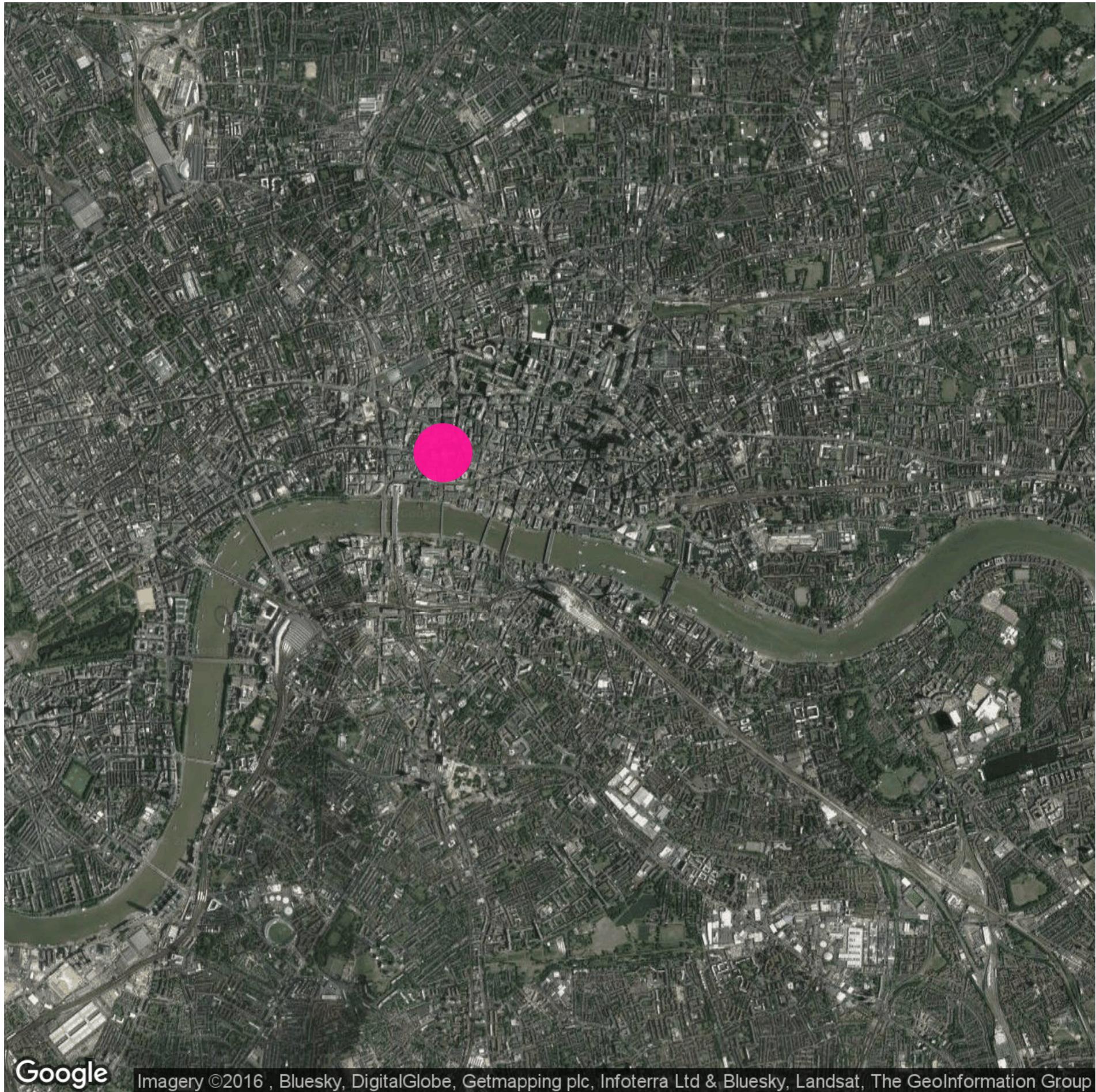
What are the aes x and y  
variables?

# Adding points

## Then plot it...

```
ggmap(mapLondon, extent = "device") +  
  geom_point(aes(x = -0.0984, y =  
  51.5138), alpha = 0.5, color =  
  "deeppink", size = 10, pch = 4 )
```

aes: x = longitude, y = latitude



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# We can also annotate the point

```
ggmap(mapLondon, extent = "device") +  
  geom_text(aes(x = -0.0984, y = 51.5138,  
    label = "St Paul's"), colour = "yellow",  
    size = 5)
```

aes: x = longitude, y = latitude



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# Adding points

## What if you have points in a dataset?

```
ggmap(mapLondon, extent =  
"device") +  
geom_point(aes(x = Longitude, y =  
Latitude), data = mydata)
```

NB: mydata has variables  
called Longitude and Latitude

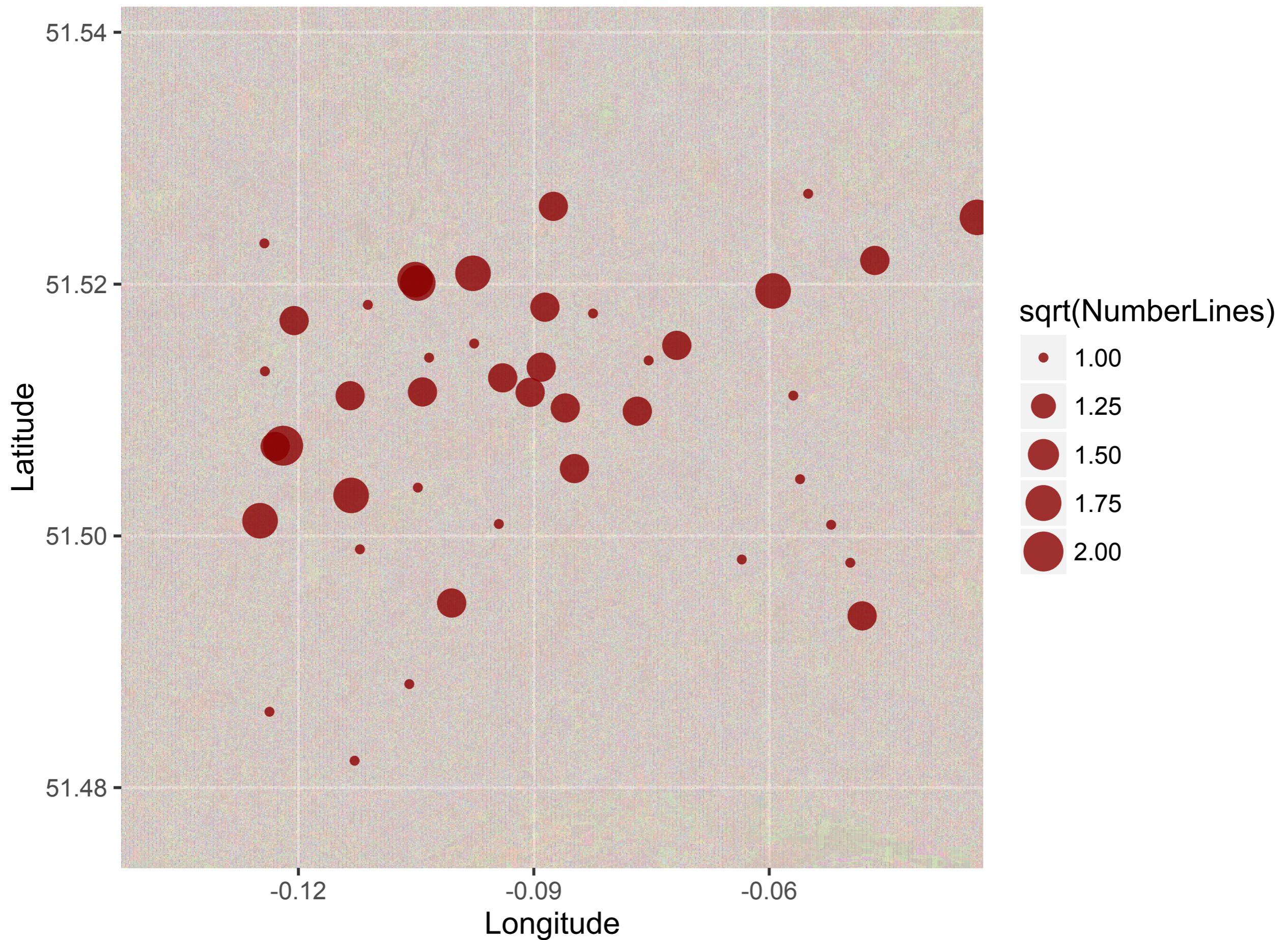
# Underground Practical

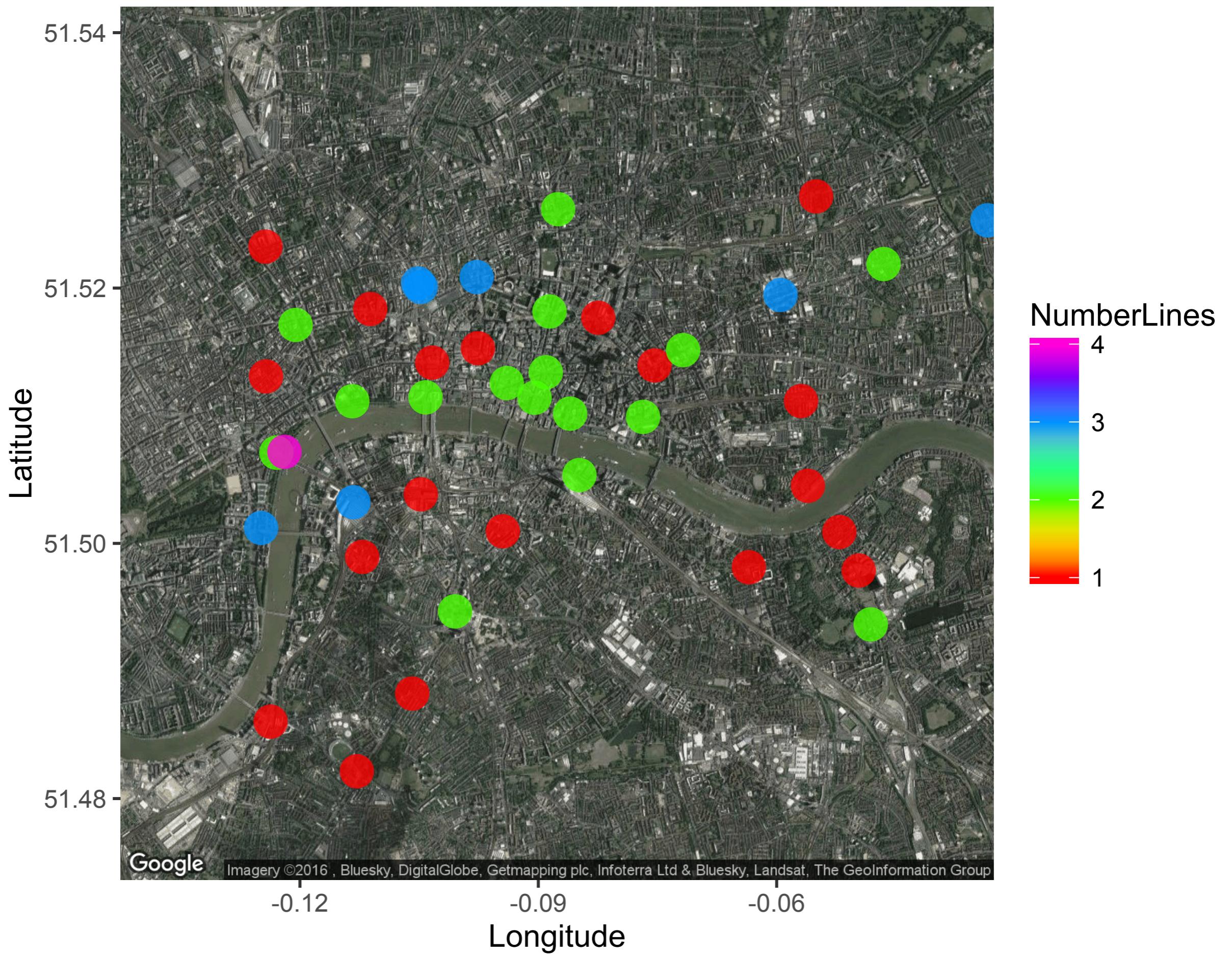
- Use map of London, centred on London Bridge (go for zoom = 13)
- Add a green cross at Tower Bridge (lon = -0.0754, lat = 51.5055). HINT: look at options for **pch**
- Read in **underground.csv**
- Plot all the underground stations onto your map
- Try and annotate with names in Station
- Try and work out how to scale the size of the points by NumberLines (the number of tube lines at each station)



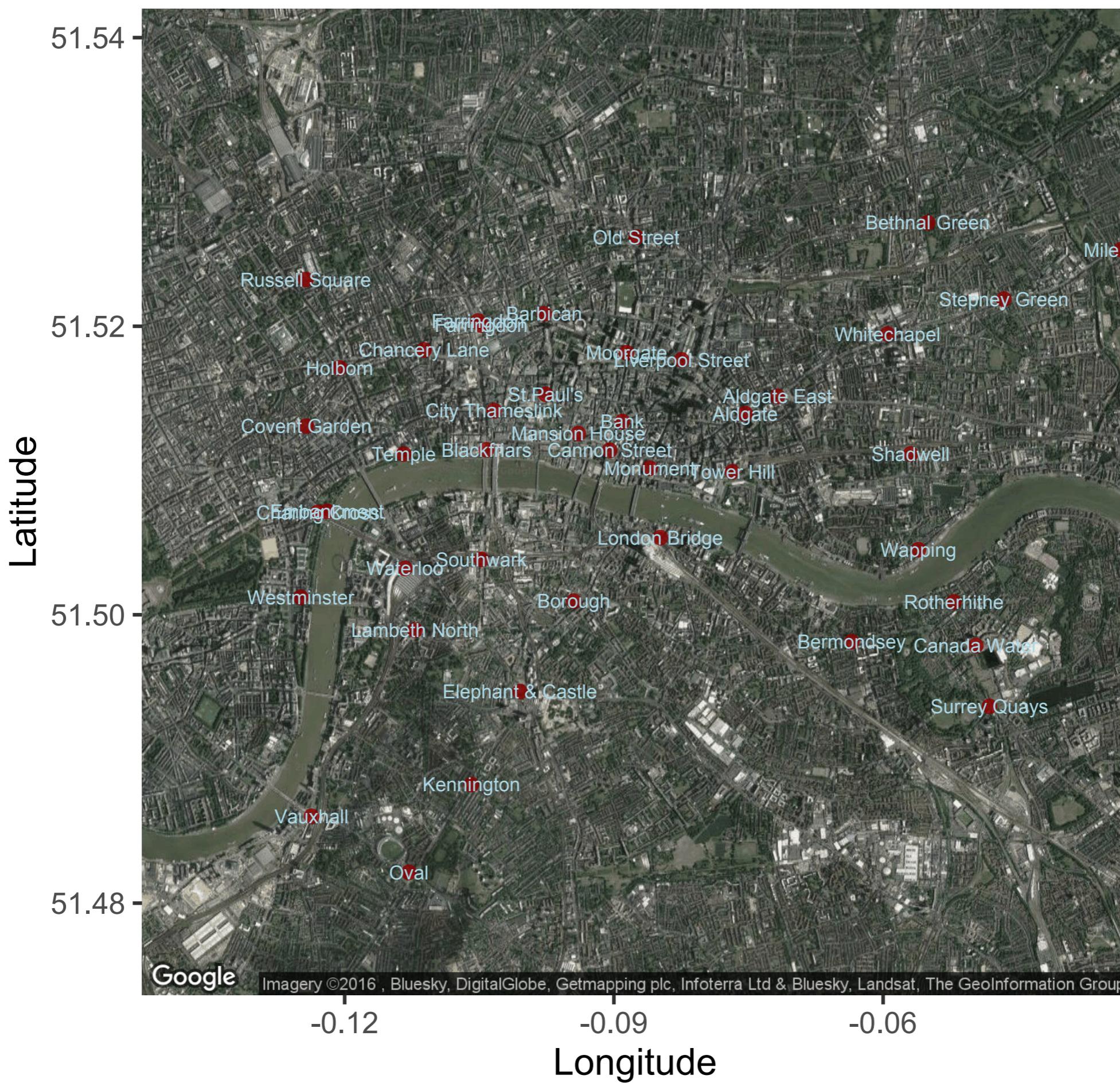
Google

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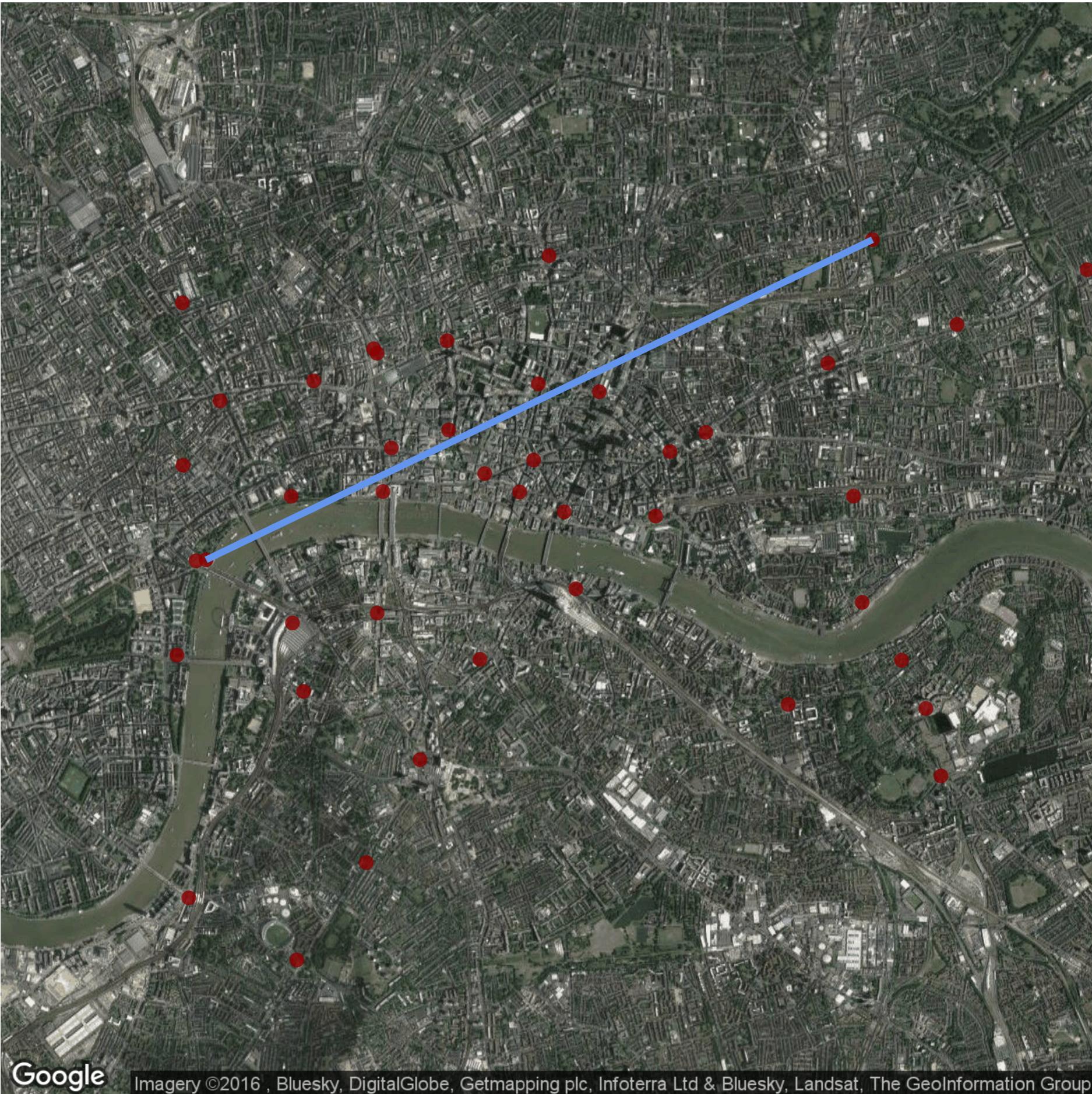


# Underground stations in East London



What about paths and  
distances? `geom_path`

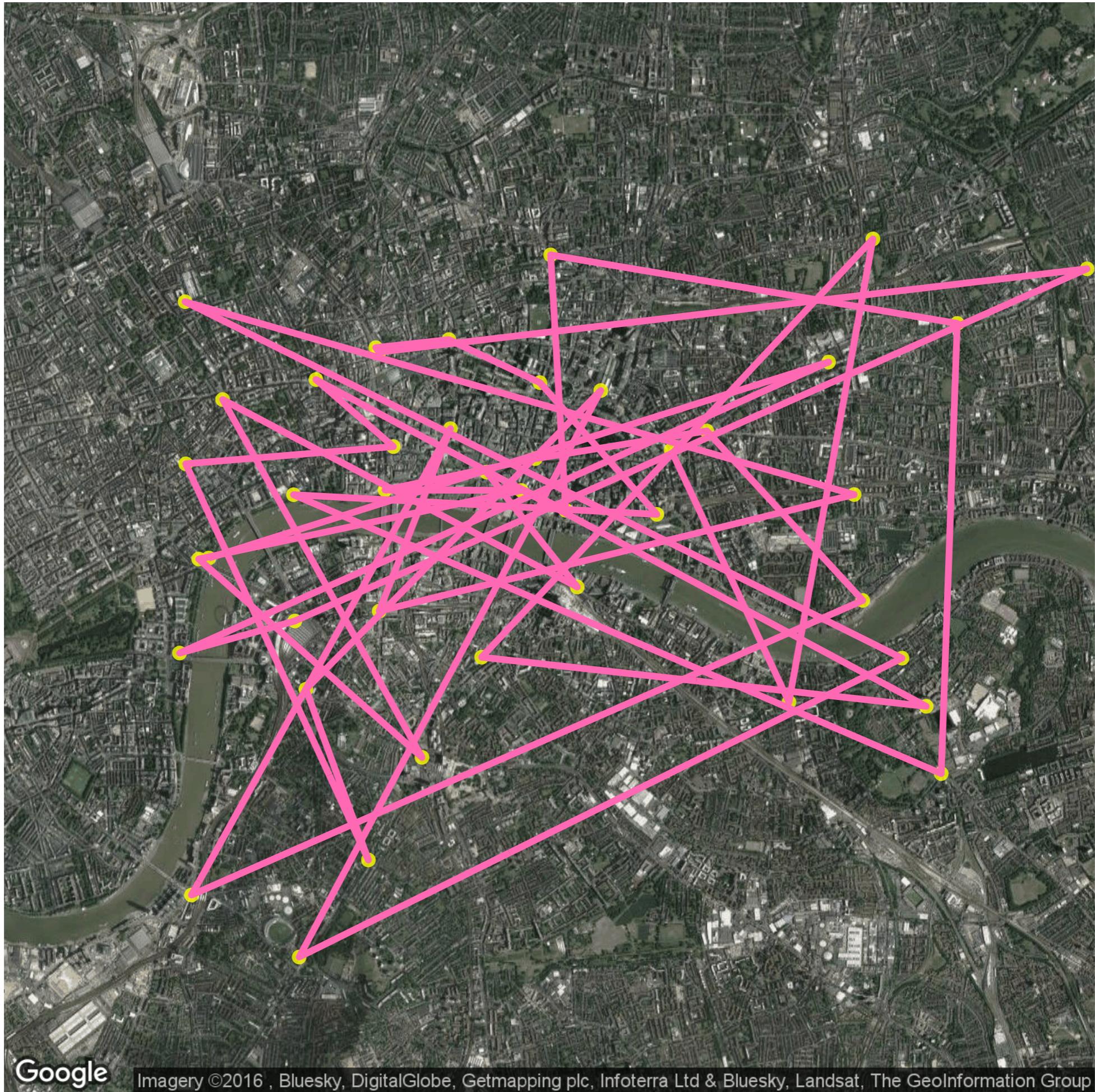
```
ggmap(mapLondon, extent =  
"device") +  
  
geom_point(aes(x = Longitude, y =  
Latitude), data = underground,  
alpha = 0.8, color = "yellow") +  
  
geom_path(aes(x = Longitude, y =  
Latitude),  
data = filter(underground,  
Station == "Bethnal Green" |  
Station == "Embankment"),  
color = "cornflowerblue")
```



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```
ggmap(mapLondon, extent =  
"device") +  
  
geom_point(aes(x = Longitude, y =  
Latitude), data = underground,  
alpha = 0.8, color = "yellow") +  
  
geom_path(aes(x = Longitude, y =  
Latitude), data = underground,  
color = "hotpink", size = 1)
```



Google

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# Getting distances...

- To get distances between places you can use Google via mapdist
- Note that you have a 2500 query limit per day
- You can see how many you have left using:  
**distQueryCheck()**

# map\_dist

```
mapdist("London, UK", "Zurich,  
Switzerland", mode = "driving")  
  
mapdist("London, UK", "Sheffield, UK",  
mode = "walking")  
  
mapdist("Sheffield, UK", "Zurich,  
Switzerland", mode = "bicycling")
```