Getting Data (Part 1)

Jeffrey Leek, Assistant Professor of Biostatistics
Johns Hopkins Bloomberg School of Public Health

Get/set your working directory

Roger's lectures windows, mac Andrew Jaffe's lecture notes

```
> getwd()
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
> setwd("/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1/data")
> getwd()
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1/data"
```

Important difference with Windows:

```
setwd("C:\\Users\\Andrew\\Downloads")
```

Get/set your working directory (relative paths)

```
getwd()
```

```
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
```

```
setwd("./data")
getwd()
```

```
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1/data"
```

```
setwd("../")
getwd()
```

```
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
```

Get/set your working directory (absolute paths)

```
> getwd()
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
> setwd("/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1/data")
> getwd()
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1/data"
```

Types of files data may come from

- Tab-delimited text
- Comma-separated text
- Excel file
- JSON File
- HTML/XML file
- Database

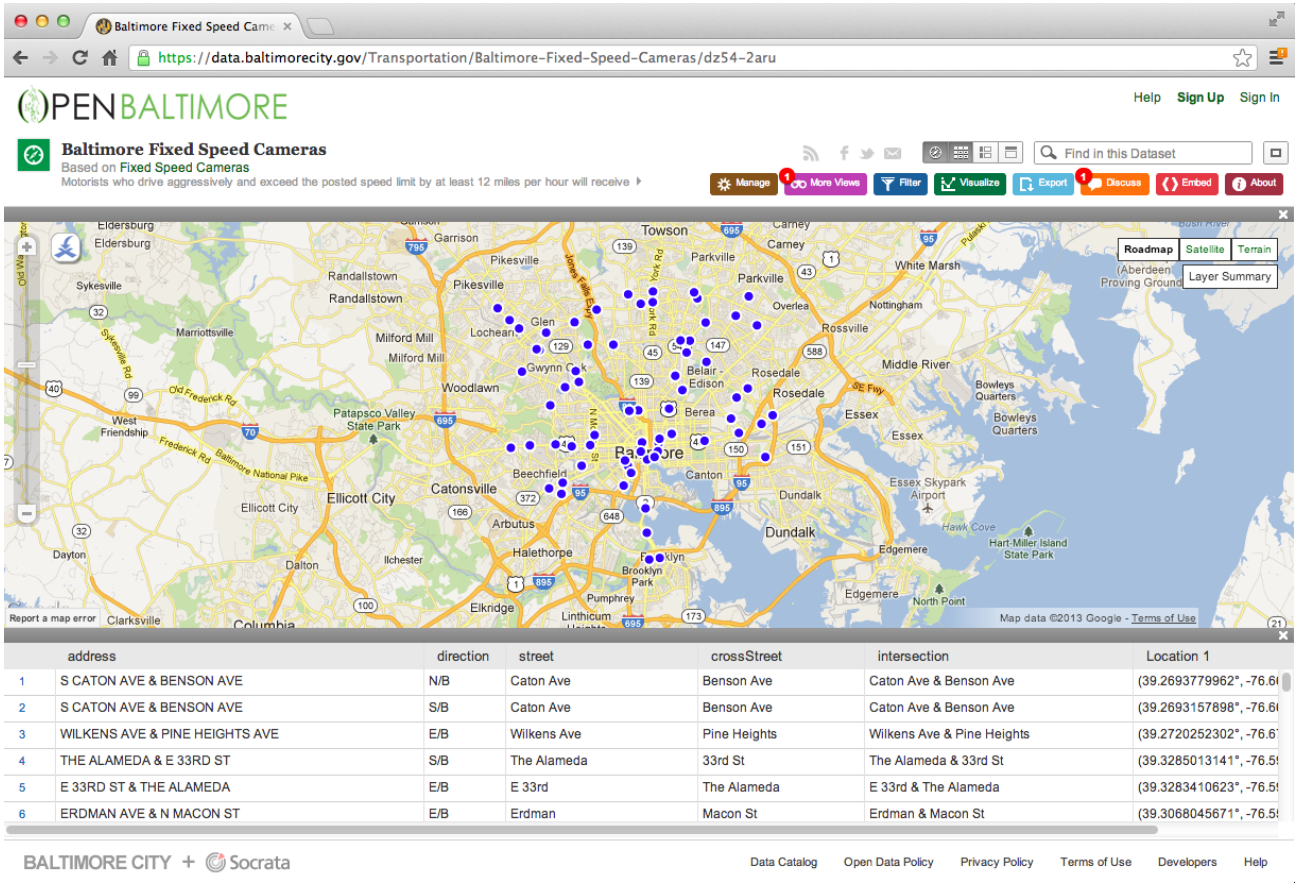
Where you can get data

- From a colleague
- From the web
- From an application programming interface
- By scraping a web page

Getting data from the internet - download.file()

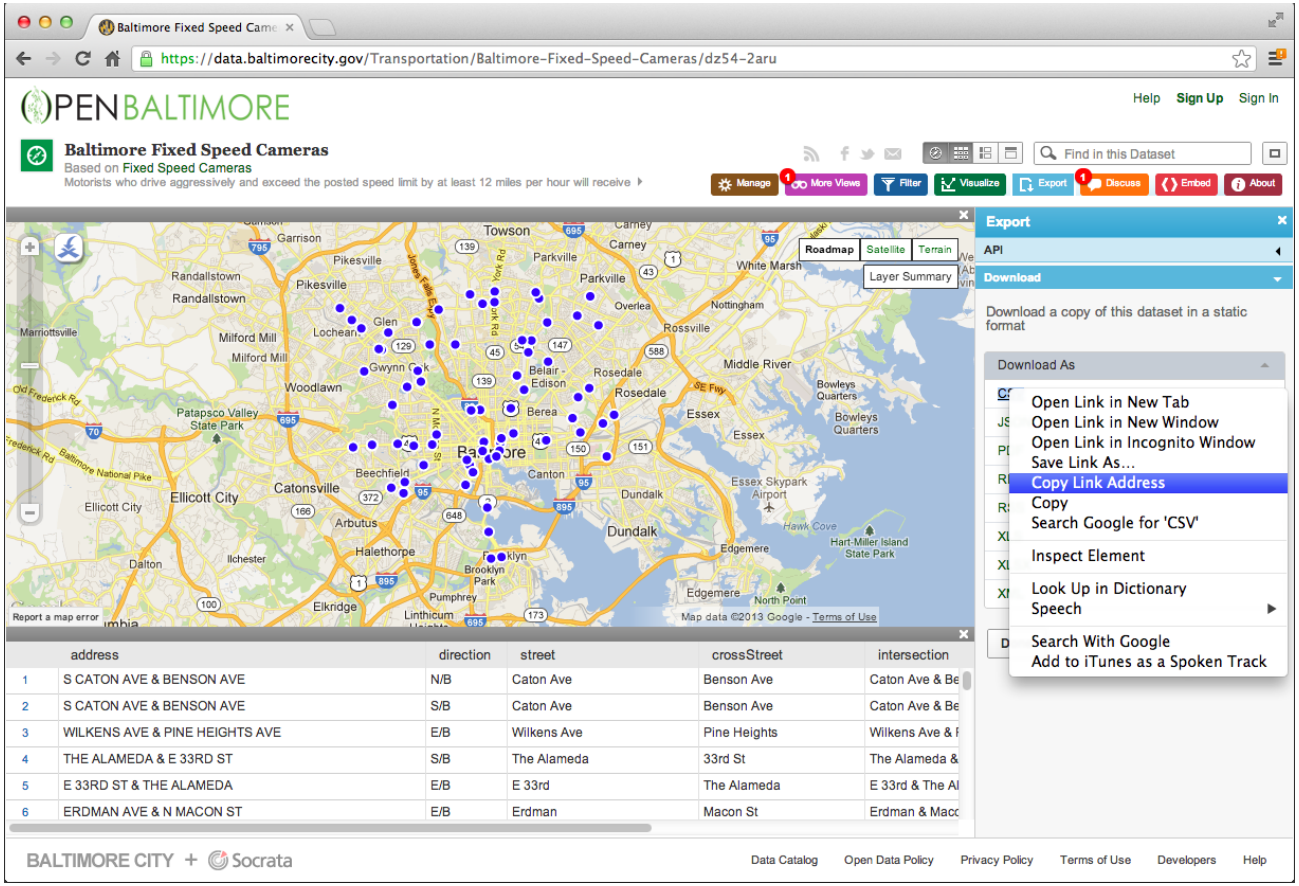
- Downloads a file from the internet
- Even if you could do this by hand, helps with reproducibility
- Important parameters are *url*, *destfile*, *method*
- Useful for downloading tab-delimited, csv, etc.

Example - Baltimore camera data



https://data.baltimorecity.gov/Transportation/Baltimore-Fixed-Speed-Cameras/dz54-2aru

Example - Baltimore camera data,csv



https://data.baltimorecity.gov/Transportation/Baltimore-Fixed-Speed-Cameras/dz54-2aru

Download a file from the web

```
fileUrl <- "https://data.baltimorecity.gov/api/views/dz54-2aru/rows.csv?accessType=DOWNLOAD"
download.file(fileUrl,destfile="./data/cameras.csv",method="curl")
list.files("./data")
```

```
[1] "camera.json"         "camera.xlsx"         "cameras.csv"
[4] "cameras.rda"         "camerasModified.csv"
```

```
dateDownloaded <- date()
dateDownloaded
```

```
[1] "Wed Aug 28 13:27:31 2013"
```

Some notes about download.file()

- If the url starts with *http* you can use download.file()
- If the url starts with *https* on Windows you may be ok
- If the url starts with *https* on Mac you may need to set *method="curl"*
- If the file is big, this might take a while
- Be sure to record when you downloaded.

Loading data you have saved - read.table()

- This is the main function for reading data into R
- Flexible and robust but requires more parameters
- Reads the data into RAM - big data can cause problems
- Important parameters *file*, *header*, *sep*, *row.names*, *nrows*
- Related: *read.csv()*, *read.csv2()*

Example: Baltimore camera data

```
getwd()
```

```
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
```

```
cameraData <- read.table("./data/cameras.csv")
```

```
Error: line 1 did not have 13 elements
```

```
head(cameraData)
```

```
Error: error in evaluating the argument 'x' in selecting a method for
function 'head': Error: object 'cameraData' not found
```

Example: Baltimore camera data

```
getwd()
```

```
[1] "/Users/jtleek/Dropbox/Jeff/teaching/2013/coursera/week2/004gettingData1"
```

```
cameraData <- read.table("./data/cameras.csv",sep=",",header=TRUE)
```

Example: Baltimore camera data

```
head(cameraData)
```

```
                        address direction      street  crossStreet
1       S CATON AVE & BENSON AVE       N/B   Caton Ave   Benson Ave
2       S CATON AVE & BENSON AVE       S/B   Caton Ave   Benson Ave
3 WILKENS AVE & PINE HEIGHTS AVE       E/B Wilkens Ave Pine Heights
4        THE ALAMEDA & E 33RD ST       S/B The Alameda      33rd St
5        E 33RD ST & THE ALAMEDA       E/B      E 33rd  The Alameda
6
1     Caton Ave & Benson Ave (39.2693779962, -76.6688185297)
2     Caton Ave & Benson Ave (39.2693157898, -76.6689698176)
3 Wilkens Ave & Pine Heights  (39.2720252302, -76.676960806)
4     The Alameda  & 33rd St (39.3285013141, -76.5953545714)
5      E 33rd  & The Alameda (39.3283410623, -76.5953594625)
6         Erdman  & Macon St (39.3068045671, -76.5593167803)
```

Example: Baltimore camera data

read.csv sets *sep=","* and *header=TRUE*

```
cameraData <- read.csv("./data/cameras.csv")
head(cameraData)
```

```
                      address direction      street  crossStreet
1       S CATON AVE & BENSON AVE       N/B   Caton Ave   Benson Ave
2       S CATON AVE & BENSON AVE       S/B   Caton Ave   Benson Ave
3 WILKENS AVE & PINE HEIGHTS AVE       E/B Wilkens Ave Pine Heights
4        THE ALAMEDA & E 33RD ST       S/B The Alameda      33rd St
5       E 33RD ST & THE ALAMEDA       E/B      E 33rd  The Alameda
6
1     Caton Ave & Benson Ave (39.2693779962, -76.6688185297)
2     Caton Ave & Benson Ave (39.2693157898, -76.6689698176)
3 Wilkens Ave & Pine Heights  (39.2720252302, -76.676960806)
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5      E 33rd  & The Alameda (39.3283410623, -76.5953594625)
6         Erdman  & Macon St (39.3068045671, -76.5593167803)
```

read.xlsx(), read.xlsx2() {xlsx package}

- Reads .xlsx files, but slow
- Important parameters *file*, *sheetIndex*, *sheetIndex*, *rowIndex*, *colIndex*, *header*
- read.xlsx2() relies more on low level Java functions so may be a bit faster

read.xlsx() - Baltimore camera data

You may need to run `install.packages("xlsx")` if the xlsx package is not already installed

```
library(xlsx)
fileUrl <- "https://data.baltimorecity.gov/api/views/dz54-2aru/rows.xlsx?accessType=DOWNLOAD"
download.file(fileUrl,destfile="./data/camera.xlsx",method="curl")
cameraData <- read.xlsx2("./data/camera.xlsx",sheetIndex=1)
```

read.xlsx() - Baltimore camera data

```
head(cameraData)
```

```
                       address direction      street  crossStreet
1       S CATON AVE & BENSON AVE       N/B   Caton Ave   Benson Ave
2       S CATON AVE & BENSON AVE       S/B   Caton Ave   Benson Ave
3 WILKENS AVE & PINE HEIGHTS AVE       E/B Wilkens Ave Pine Heights
4        THE ALAMEDA & E 33RD ST       S/B The Alameda      33rd St
5        E 33RD ST & THE ALAMEDA       E/B      E 33rd  The Alameda
6
1     Caton Ave & Benson Ave (39.2693779962, -76.6688185297)
2     Caton Ave & Benson Ave (39.2693157898, -76.6689698176)
3 Wilkens Ave & Pine Heights  (39.2720252302, -76.676960806)
4     The Alameda  & 33rd St (39.3285013141, -76.5953545714)
5      E 33rd  & The Alameda (39.3283410623, -76.5953594625)
6         Erdman  & Macon St (39.3068045671, -76.5593167803)
```

Picking a file - less reproducible, but useful

```
cameraData <- read.csv(file.choose())
```