

# A smartphone app selecting locations for city cleaners

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# Background of app design

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- Serious situation for the government fighting against littering
- Limited number of cleaners working for the city
- Eager to find elaborated methods to increase cleaner's efficiency
- Citizens' awareness of keeping the city clean
- 311 Calls for littering: a good resource for data analysis



[Plot Link:](https://publicworks.baltimorecity.gov/solid-waste)

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# Required data for our app

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Data implemented in the app so far:

1. Daily 311 call data of Baltimore City for littering [Available online](#)
2. Google Map API used to determine the location of reported litters

Data input of our app when used every time:

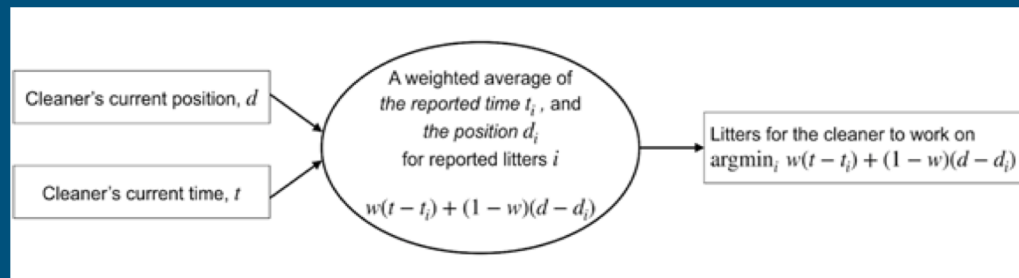
- User's current location
- User's current time

# Output data & Flow of experience

Output of our app:

- Current location (green triangle)
- Recommended next work location (red star)
- All other work location (yellow dot)

Flow of Experience:



# Ways to collect/present data

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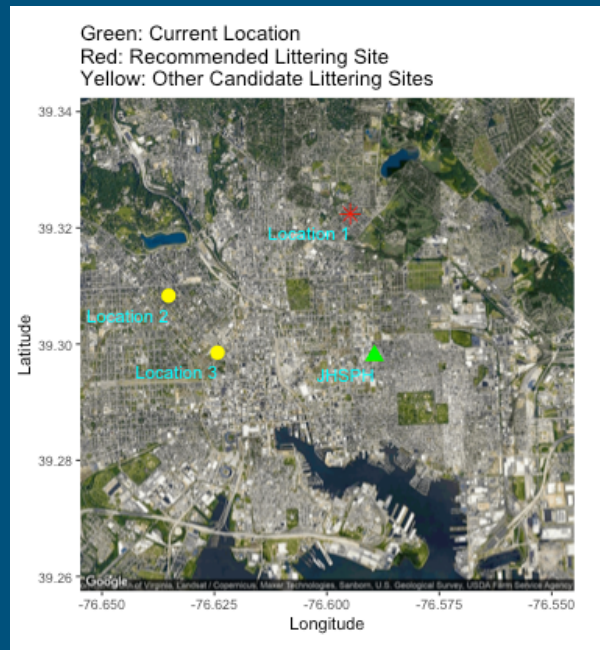
- Collect 311 call data from the local government database every day
- Set up Google Map API for obtaining location information or enabling navigation for cleaners
- Use Greedy Algorithm to search for a reported litter on file balancing urgency ( $t$ ) and distance ( $d$ )
- Navigate the cleaner to the reported litter location via Google Map API data

Our Goal: Reduce 311 calls of littering in Baltimore City by 3% to 5% each year in the next 5 years

# Use case

A Shiny App: [https://erjiacui.shinyapps.io/data\\_sprint/](https://erjiacui.shinyapps.io/data_sprint/)

- Suppose cleaner starts his/her work at JHSPH
- Every time one work is finished, update current location and current time to get next recommended work location
- May have new littering sites as time goes by
- The data points are collected from real 311 calls in Baltimore city that can be downloaded from [here](#)



# Discussion: How the app may fail

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- The internet may fail in some locations at the city (metro stations, etc.)
- Cleaners may not have their smartphones available all the time at work

Thank You!

