

Fixing



So I can actually use my subscription!

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What would it take to get
this solution running?



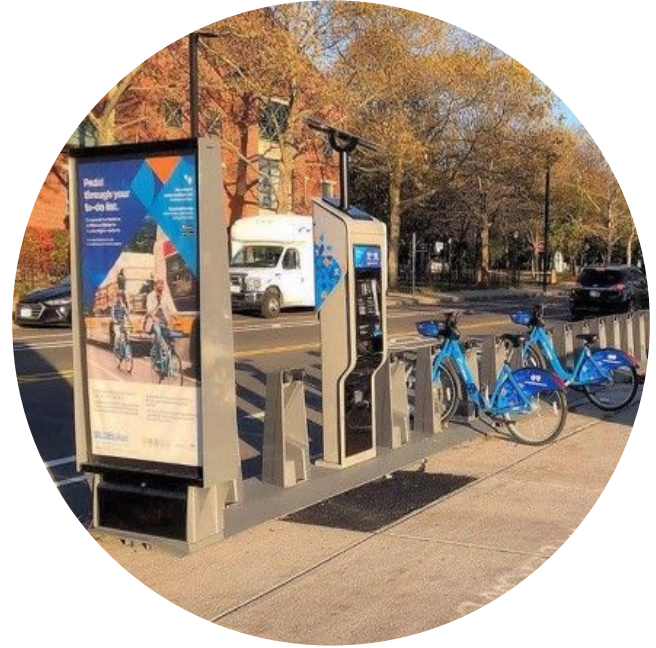
01

The Problem

I can never find a bike.

The Problem

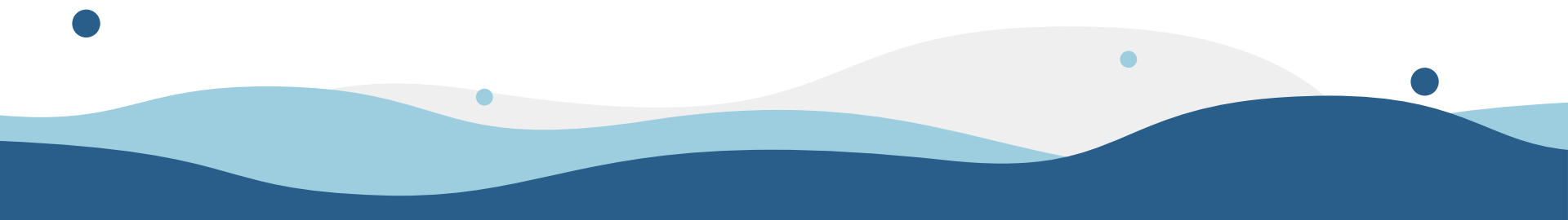
- Never enough bikes or docks!
- Everybody wants to leave from Maseeh and go to Kendall :/





Why Care?

For me, it's a matter of
convenience. For some, it's a
really big deal.





02

My Approach

What if BlueBikes was more active
in managing demand?

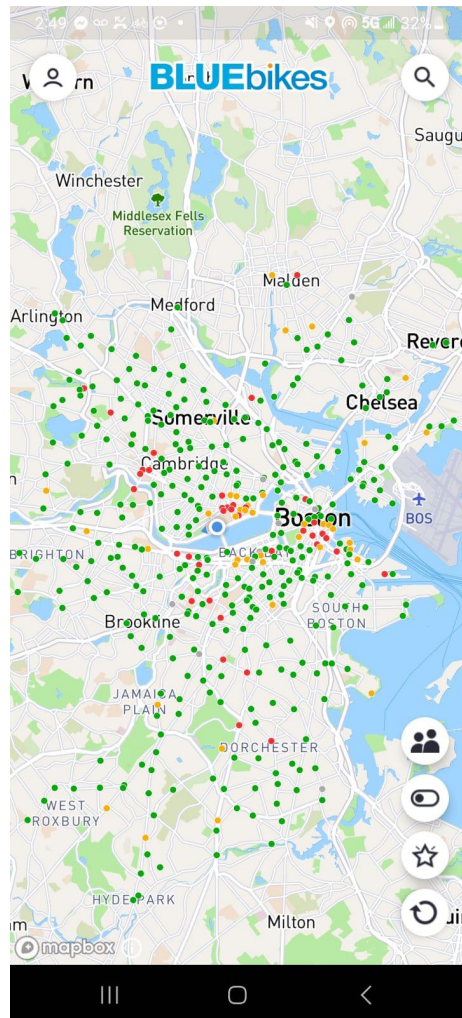
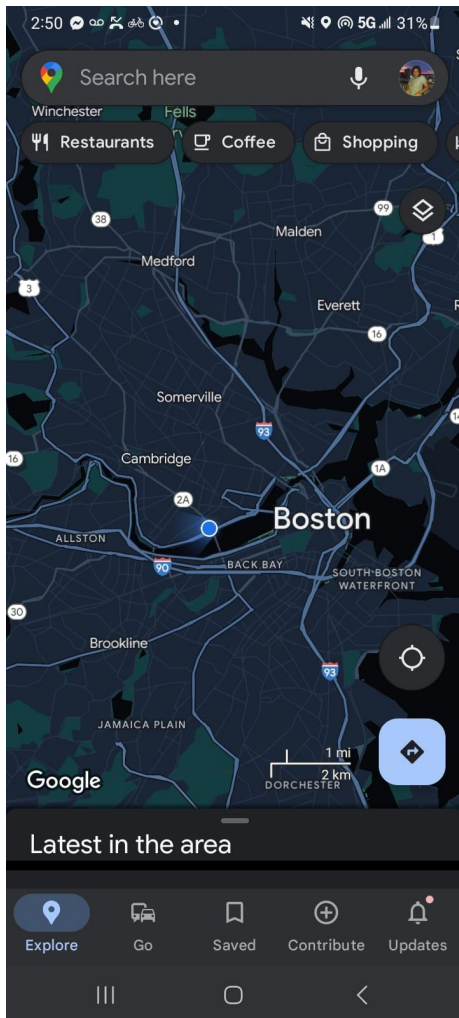




The Idea

- Have BlueBikes trucks travel between stations, moving bikes as needed.
- Minimize time spent on the road.
- Minimize the number of stations with no bikes or docks.





Methodology

1. Calculated distances between all pairs of stations that are close enough to each other.
2. Found the BlueBikes stations that were low on bikes and docks and assigned them a demand.
3. Used the Gurobi Optimizer to plan an optimal route.
 - Time Limit: 2 hours
 - Storage Limit: 50 bikes

Gurobi Model

Parameters:

- `travel_times`: Dict(Tuple(Str, Str), Int), maps pairs of stations to travel times (seconds)
- `demand`: Dict(Str, Int), maps stations to number of bikes or docks they need
- `multipliers`: Dict(Str, Int), maps stations to their popularity

Variables:

- `path[1:#stations, 1:30]`: an array of Binary variables that represents whether station `i` is visited at step `j` of the path
- `bikes[1:30]`: an array of Integer variables representing how many bikes are picked up or dropped off at each step

Constraints:

- There are always between 0 and 50 bikes in the truck.
- There is only one station visited at each step of the path.
- There are never fewer than 0 bikes or docks at each station.
- The total travel time is less than two hours.

Objective:

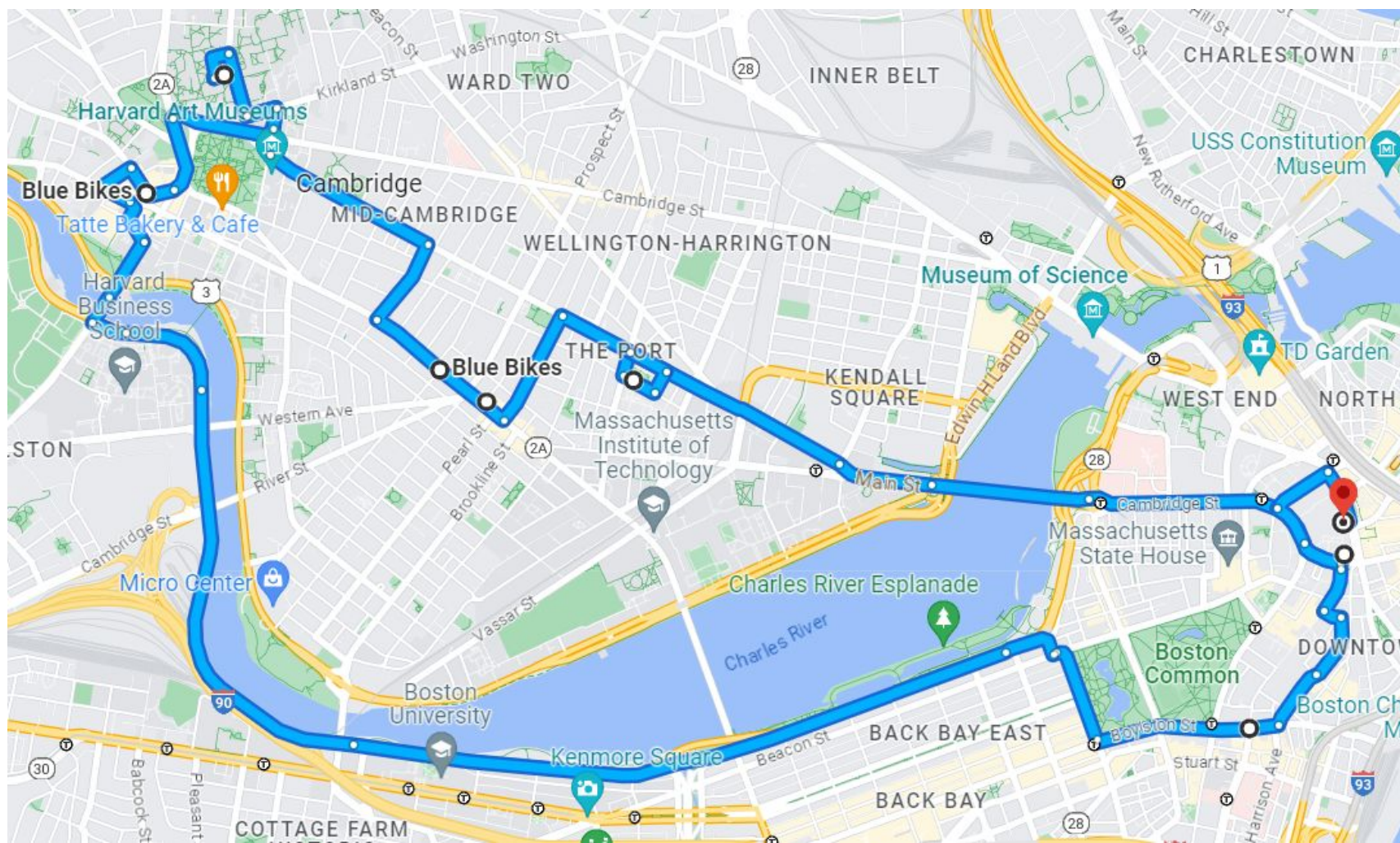
- Minimize the number of bikes and docks that are demanded at each station.



03

Results

What did I observe?





Code and more results:
<https://tinyurl.com/ABW-final-code>



04

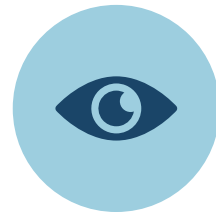
Conclusion

How do I make this solution
practical and marketable?



Finances

Is ferrying around a bunch of bikes worth the monetary cost?



Vision

Will this solution attract more long-term customers to BlueBikes?

Thanks

Questions and comments
welcome!

prava241@mit.edu



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