

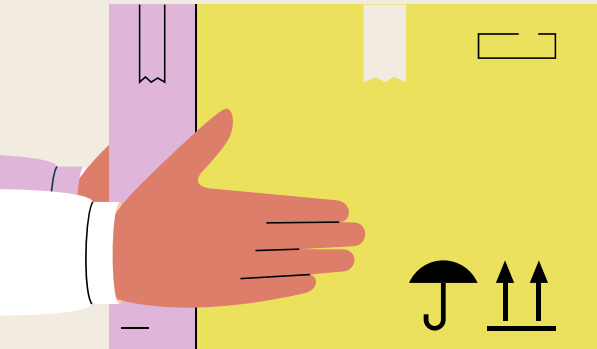


Logistics Routing



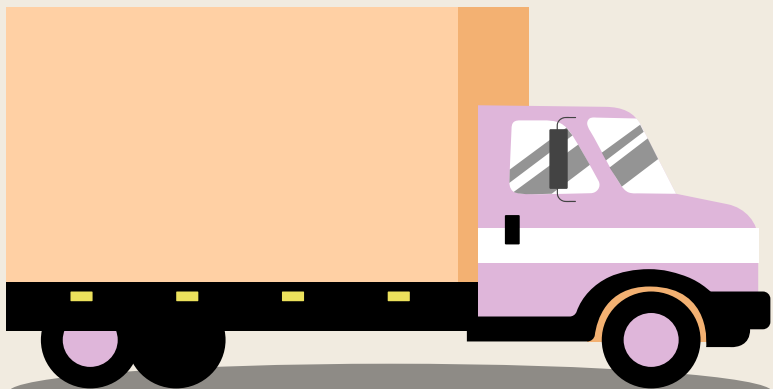
Content

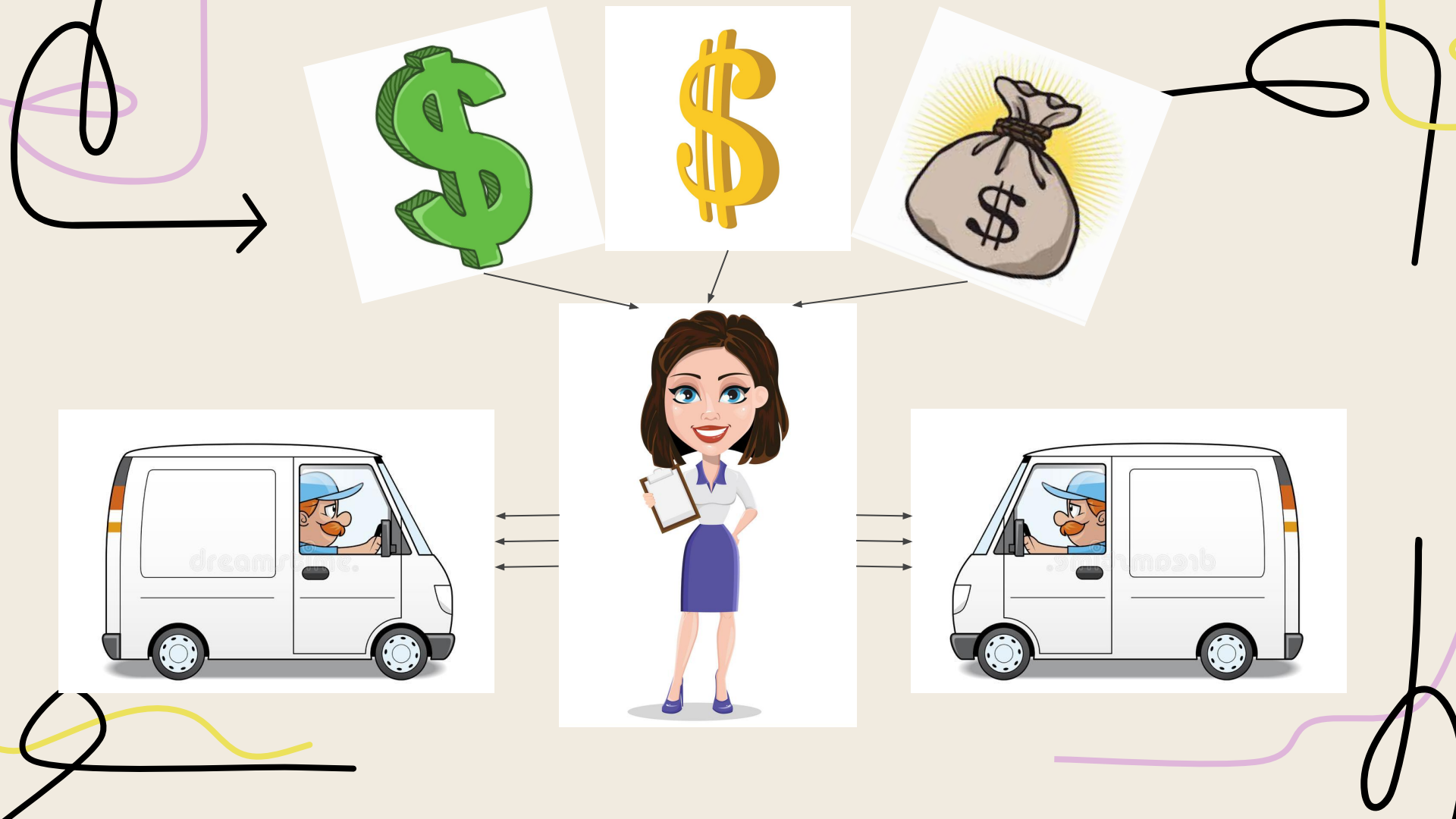
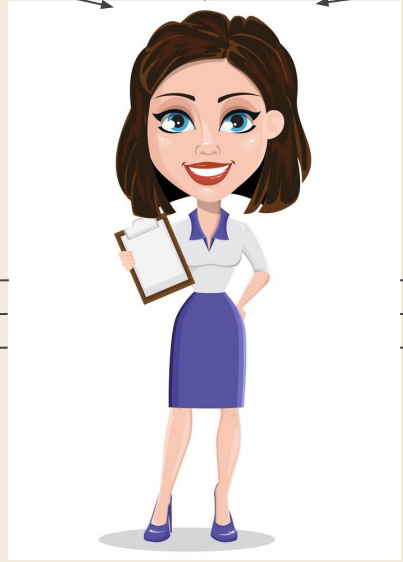
- Current process
- Problems that arise
- Which problem to focus on
- The Solution
- How to evaluate success?
- Almost Finished Product

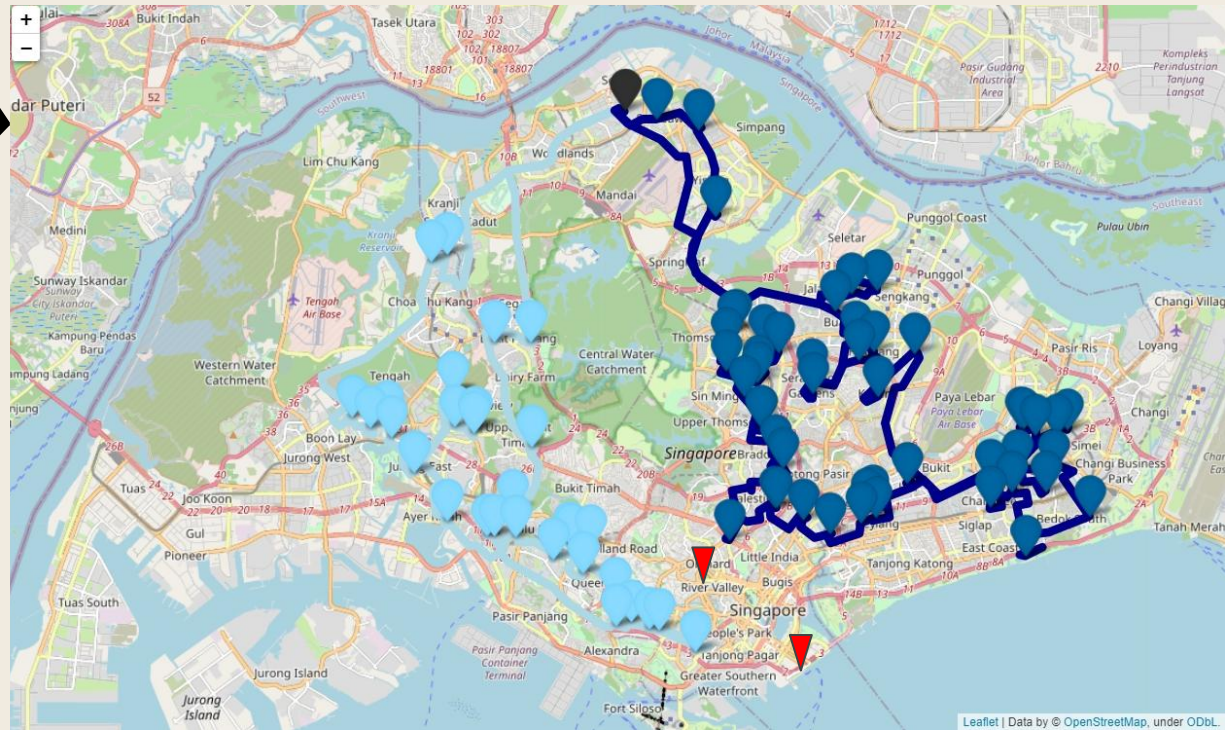


01

Current Process







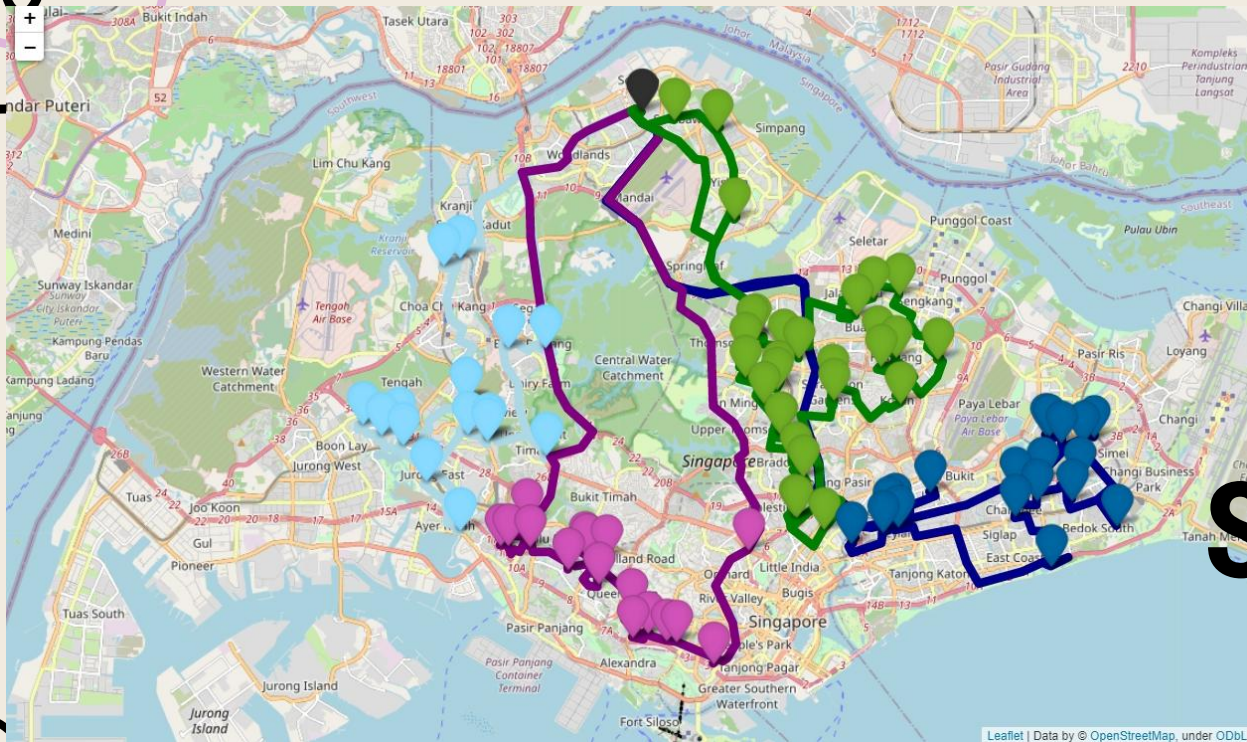
02

Problems:

- Denying Responsibility
- Creating a toxic environment for admin
- Suboptimal routing
- Etc

Focus on making location assignment clear and as fair as possible





03 The Solution

Create Database

Google Maps API

Name	Lat	Lng
ng teng fong hospital, singapore	1.333745	103.7454
oh guan lee, singapore	1.311447	103.8674
old airport road food centre, singapore	1.308241	103.8858
pereira road, singapore	1.337738	103.886
qaseh kitchen, singapore	1.4512	103.7935
queensway shopping centre, singapore	1.287553	103.8035
sembawang hills food centre, singapore	1.372288	103.829
the clementi mall, singapore	1.314918	103.7643
tiong bahru food centre, singapore	1.285138	103.8329


Daily Locations

	0		
69	823a tampines street 81, singapore		
70	848 yishun street 81, singapore		
71	89 circuit road, singapore		
72	90 whampoa drive, singapore		
73	91 whampoa drive, singapore		
74	923 hougang street 91, singapore		
75	abc brickworks, singapore		
76	beauty world centre, singapore		
77	bedok food centre, singapore		
78	biomedical grove, singapore		
79	chomp chomp food centre, singapore		
80	east coast lagoon food village, singapore		

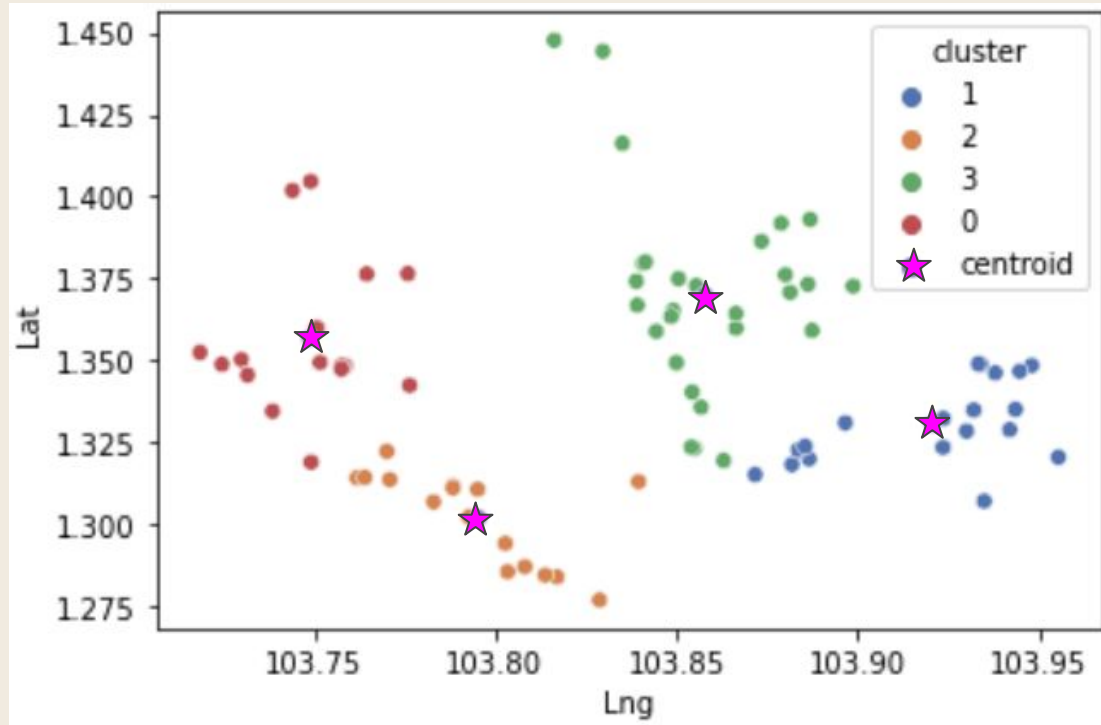


K Means



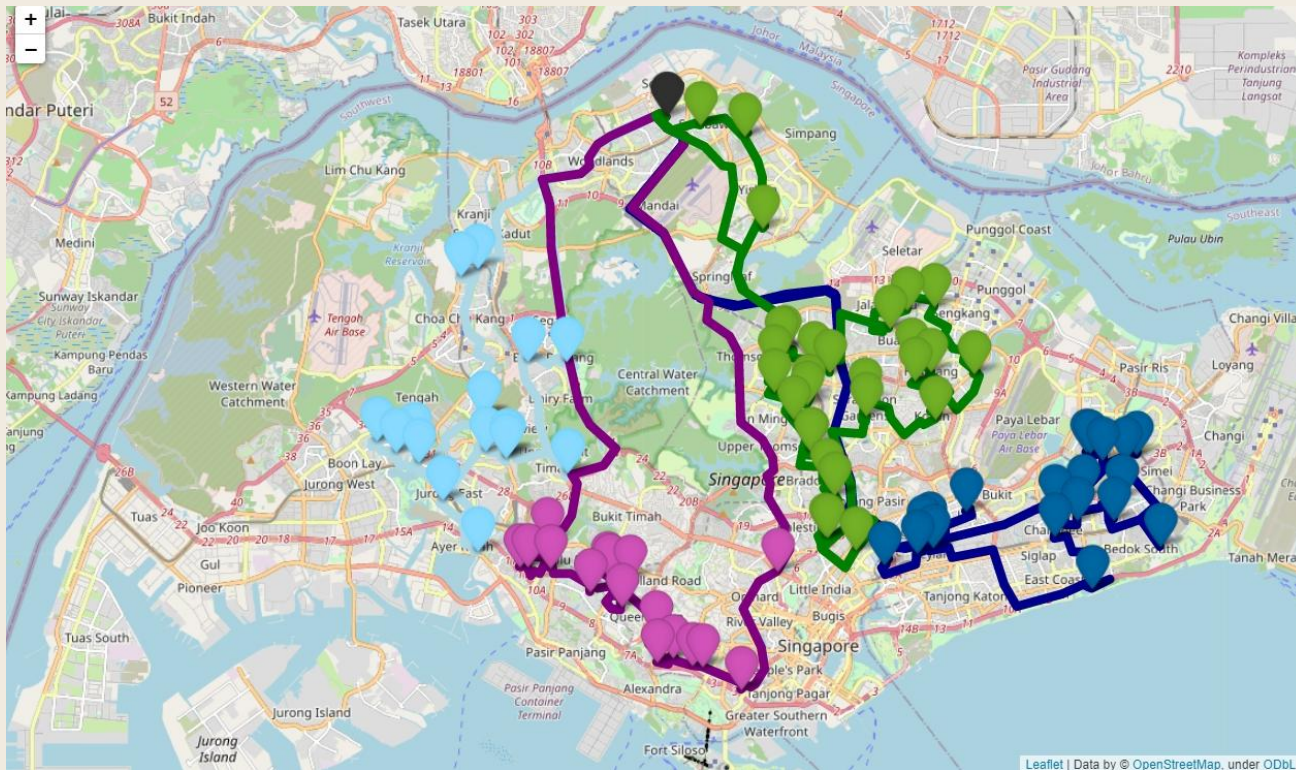
- Daily Orders
 - Customer Database
 - Number Of Drivers
Available (Number of
Clusters, 4 in this case)
- 

K Means



Routing

Open Source Routing Machine



Leaflet | Data by © OpenStreetMap, under ODbL

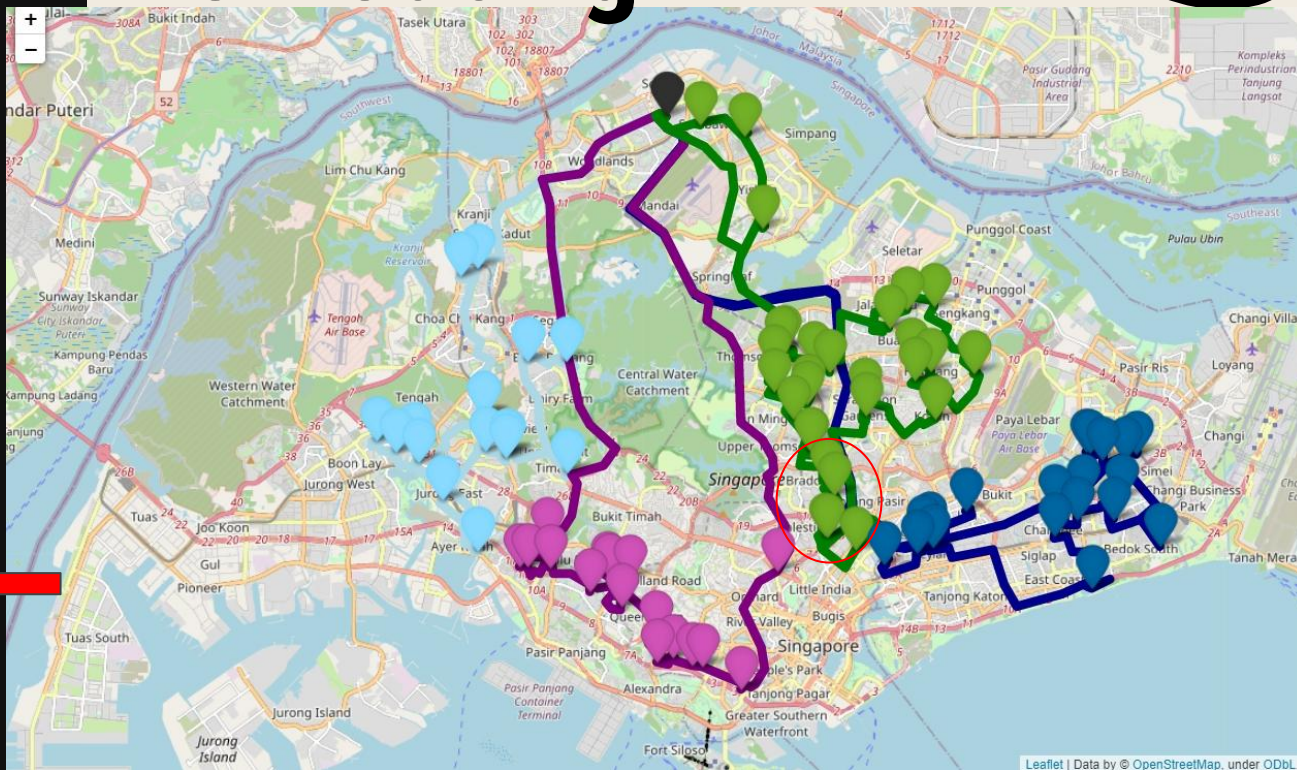
Re Routing

Vehicle 0
Traveling Duration: 1 hrs 45 mins
Distance: 62.69 km
Number of Locations: 18
lightblue
duration distance: 1hrs 34mins
duration distance + buffer: 4hrs 34mins

Vehicle 1
Traveling Duration: 2 hrs 14 mins
Distance: 99.93 km
Number of Locations: 20
darkblue
duration distance: 2hrs 30mins
duration distance + buffer: 5hrs 50mins

Vehicle 2
Traveling Duration: 1 hrs 41 mins
Distance: 66.95 km
Number of Locations: 17
purple
duration distance: 1hrs 40mins
duration distance + buffer: 4hrs 30mins

Vehicle 3
Traveling Duration: 2 hrs 18 mins
Distance: 83.07 km
Number of Locations: 30
green
duration distance: 2hrs 5mins
duration distance + buffer: 7hrs 5mins



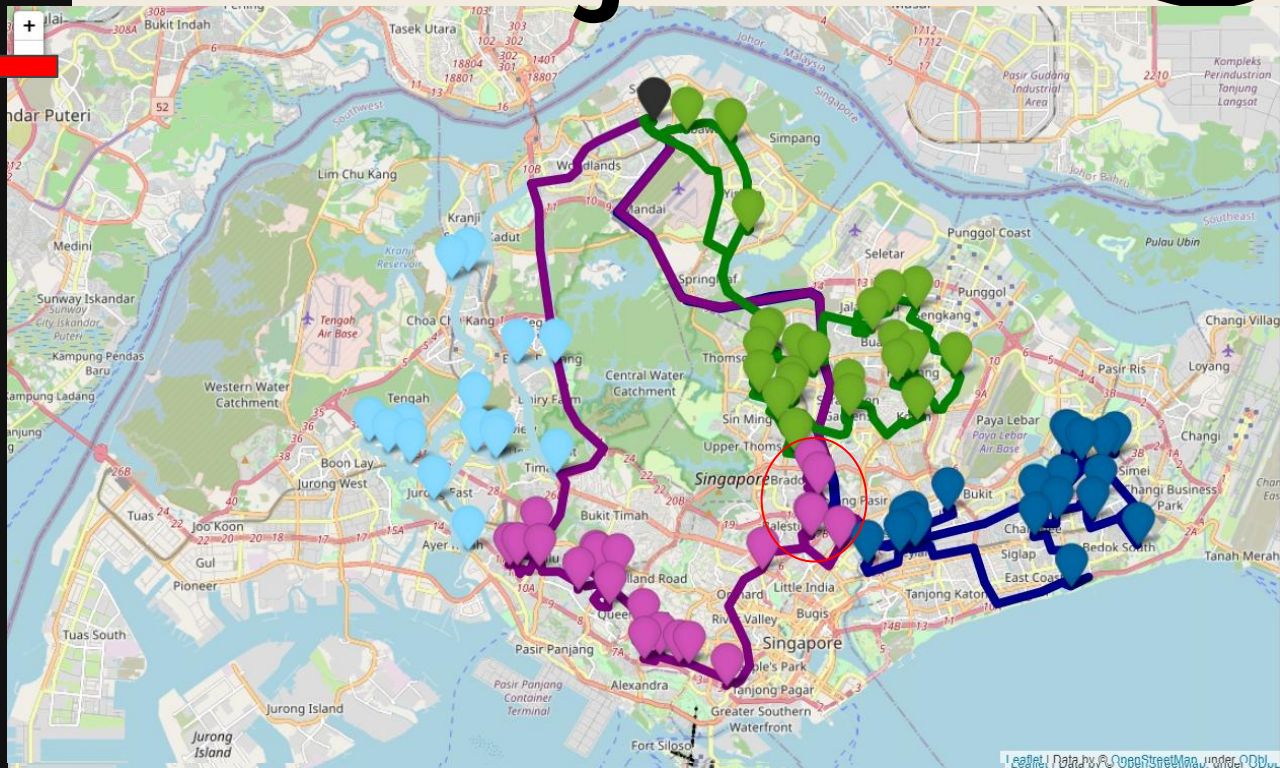
Re Routing

Vehicle 0
Traveling Duration: 1 hrs 45 mins
Distance: 62.69 km
Number of Locations: 18
lightblue
duration distance: 1hrs 34mins
duration distance + buffer: 4hrs 34mins

Vehicle 1
Traveling Duration: 2 hrs 14 mins
Distance: 99.93 km
Number of Locations: 20
darkblue
duration distance: 2hrs 30mins
duration distance + buffer: 5hrs 50mins

Vehicle 2
Traveling Duration: 1 hrs 58 mins
Distance: 79.84 km
Number of Locations: 22
purple
duration distance: 2hrs 0mins
duration distance + buffer: 5hrs 40mins

Vehicle 3
Traveling Duration: 1 hrs 55 mins
Distance: 68.63 km
Number of Locations: 25
green
duration distance: 1hrs 43mins
duration distance + buffer: 5hrs 53mins



Re Routing

```
[38]: print(f'Location to Change: {to_change} \nPresent Cluster: {present_cluster} \nNearest Other Cluster: {nearest_other_cluster}')
```

```
Location to Change: 210 toa payoh lorong 8, singapore
```

```
Present Cluster: 3
```

```
Nearest Other Cluster: 1
```

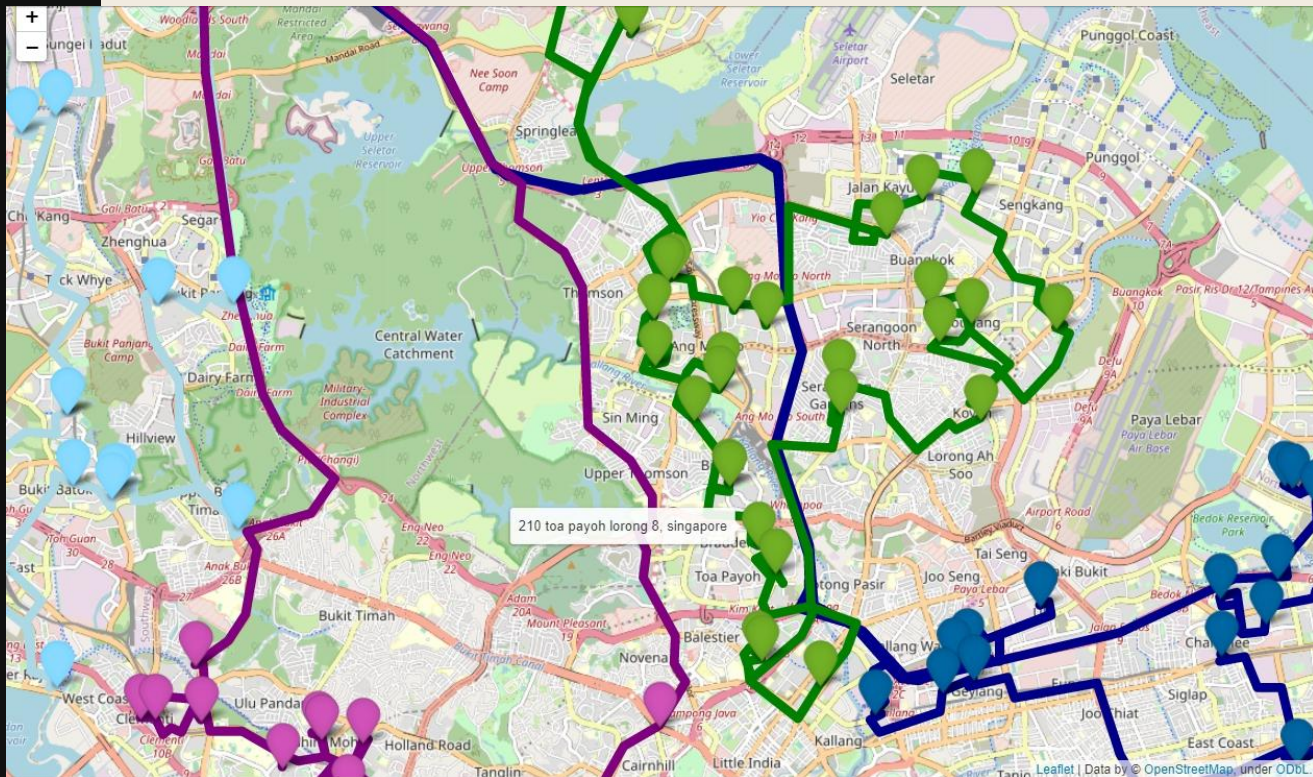

Re Routing

Vehicle 0
Traveling Duration: 1 hrs 45 mins
Distance: 62.69 km
Number of Locations: 18
lightblue
duration distance: 1hrs 34mins
duration distance + buffer: 4hrs 34mins

Vehicle 1
Traveling Duration: 2 hrs 14 mins
Distance: 99.93 km
Number of Locations: 20
darkblue
duration distance: 2hrs 30mins
duration distance + buffer: 5hrs 50mins

Vehicle 2
Traveling Duration: 1 hrs 58 mins
Distance: 79.84 km
Number of Locations: 22
purple
duration distance: 2hrs 0mins
duration distance + buffer: 5hrs 40mins

Vehicle 3
Traveling Duration: 1 hrs 55 mins
Distance: 68.63 km
Number of Locations: 25
green
duration distance: 1hrs 43mins
duration distance + buffer: 5hrs 53mins



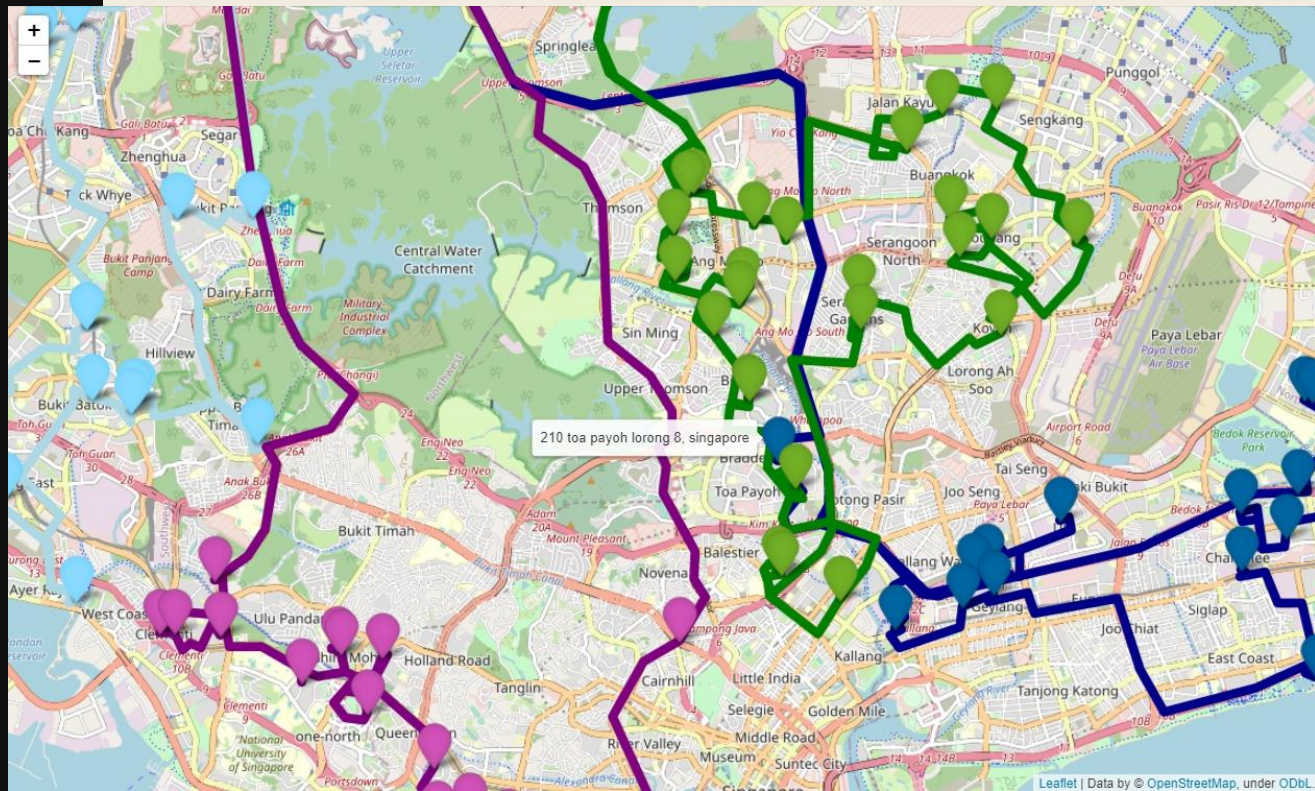
Re Routing

Vehicle 0
Traveling Duration: 1 hrs 45 mins
Distance: 62.69 km
Number of Locations: 18
lightblue
duration distance: 1hrs 34mins
duration distance + buffer: 4hrs 34mins

Vehicle 1
Traveling Duration: 2 hrs 14 mins
Distance: 99.93 km
Number of Locations: 20
darkblue
duration distance: 2hrs 30mins
duration distance + buffer: 5hrs 50mins

Vehicle 2
Traveling Duration: 1 hrs 58 mins
Distance: 79.84 km
Number of Locations: 22
purple
duration distance: 2hrs 0mins
duration distance + buffer: 5hrs 40mins

Vehicle 3
Traveling Duration: 1 hrs 55 mins
Distance: 68.63 km
Number of Locations: 25
green
duration distance: 1hrs 43mins
duration distance + buffer: 5hrs 53mins





Almost Finished Product



<http://localhost:8501/>

<http://localhost:8502/>



04



Success Evaluation

No One Size Fits All
Dependant on Situation



- Look into other clustering methods (Minimum Spanning Tree)
- Add reroute function that takes in more than 1 location at a time
- Add a sorted list of locations for each vehicle
- Add physical weight of goods into the equation

05

Future

Thanks!

Do you have any questions?

darrentu@gmail.com



CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik** and illustrations by **Storyset**

Please keep this slide for attribution

