PROJECT SUMMARY

IN-SOURCING DELIVERY ANALYSIS

Elaine Wong

Project Background

Courier service fee & demand keep rising during pandemic (9-15% increment per year)

Hypothesis:
Client can reduce 20% delivery cost with in-sourced delivery

Analytical Framework

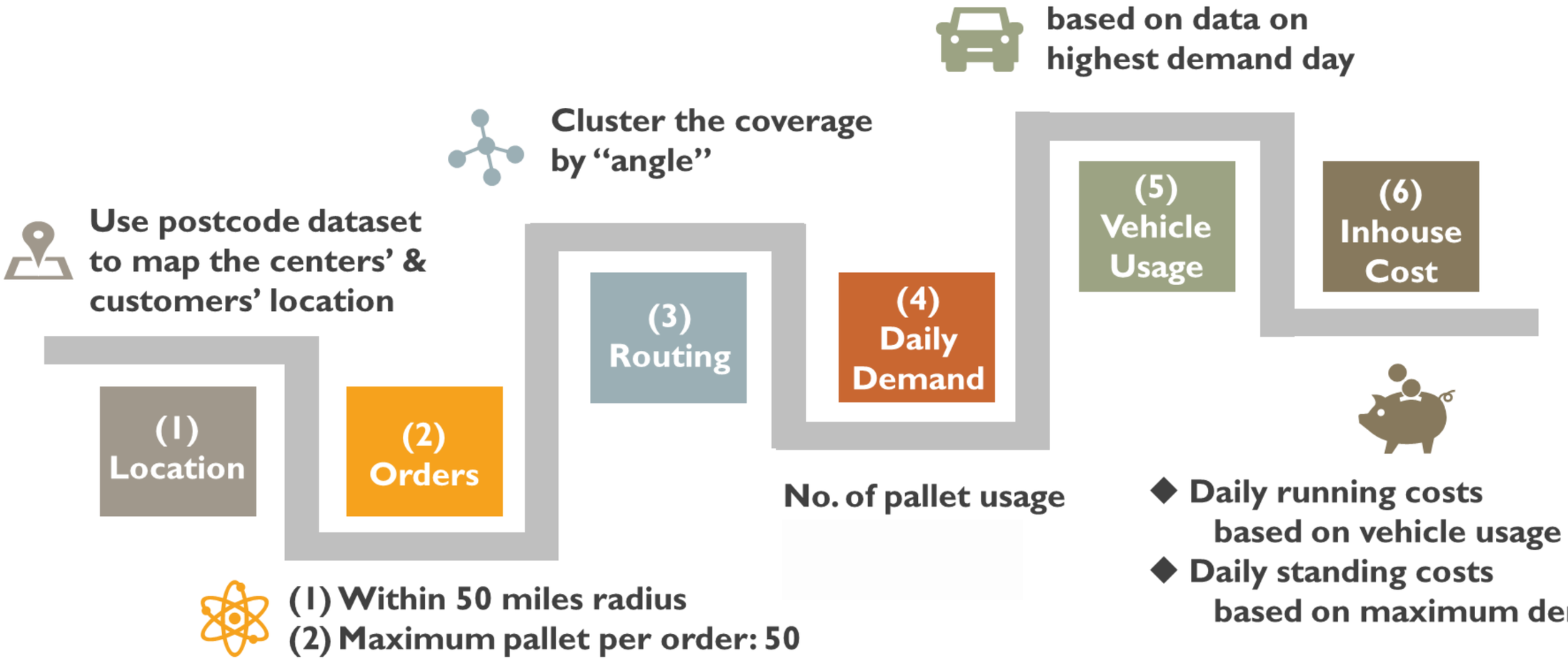
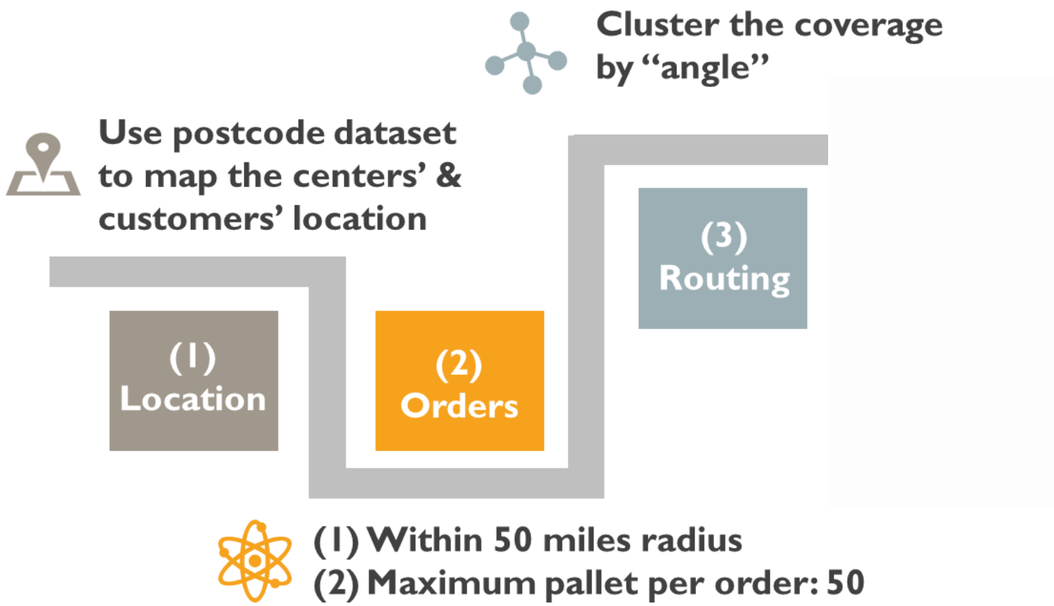
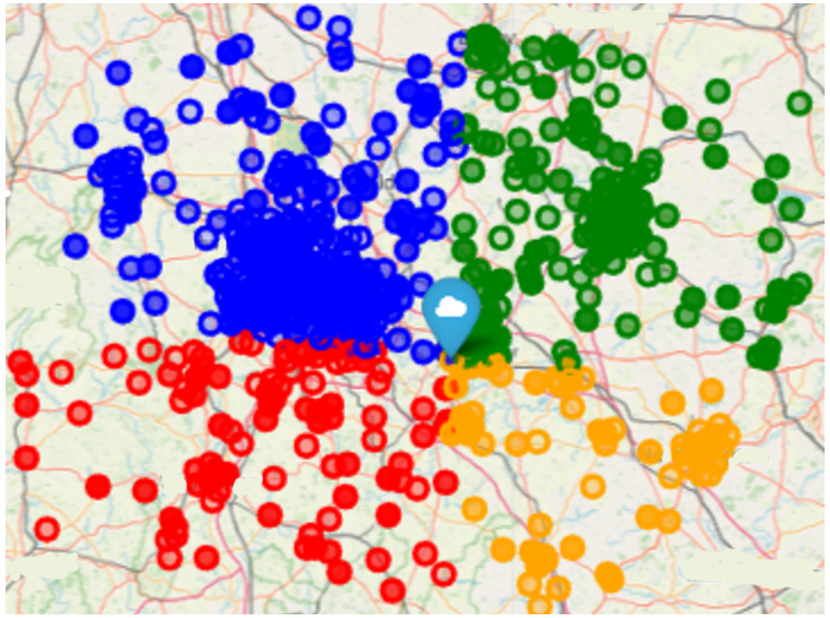


Illustration (one of the centers)

- **Determine the no. of delivery clusters for the center**





- Set limitations & data cleaning
- Convert location (latitude and longitude) to radians
- Using the center as midpoint, cluster the delivery orders based on 'angle’ (Python-folium)

Illustration (con't)

- **No. of vehicles required for the center**

based on data on highest demand day

(5) Vehicle Usage

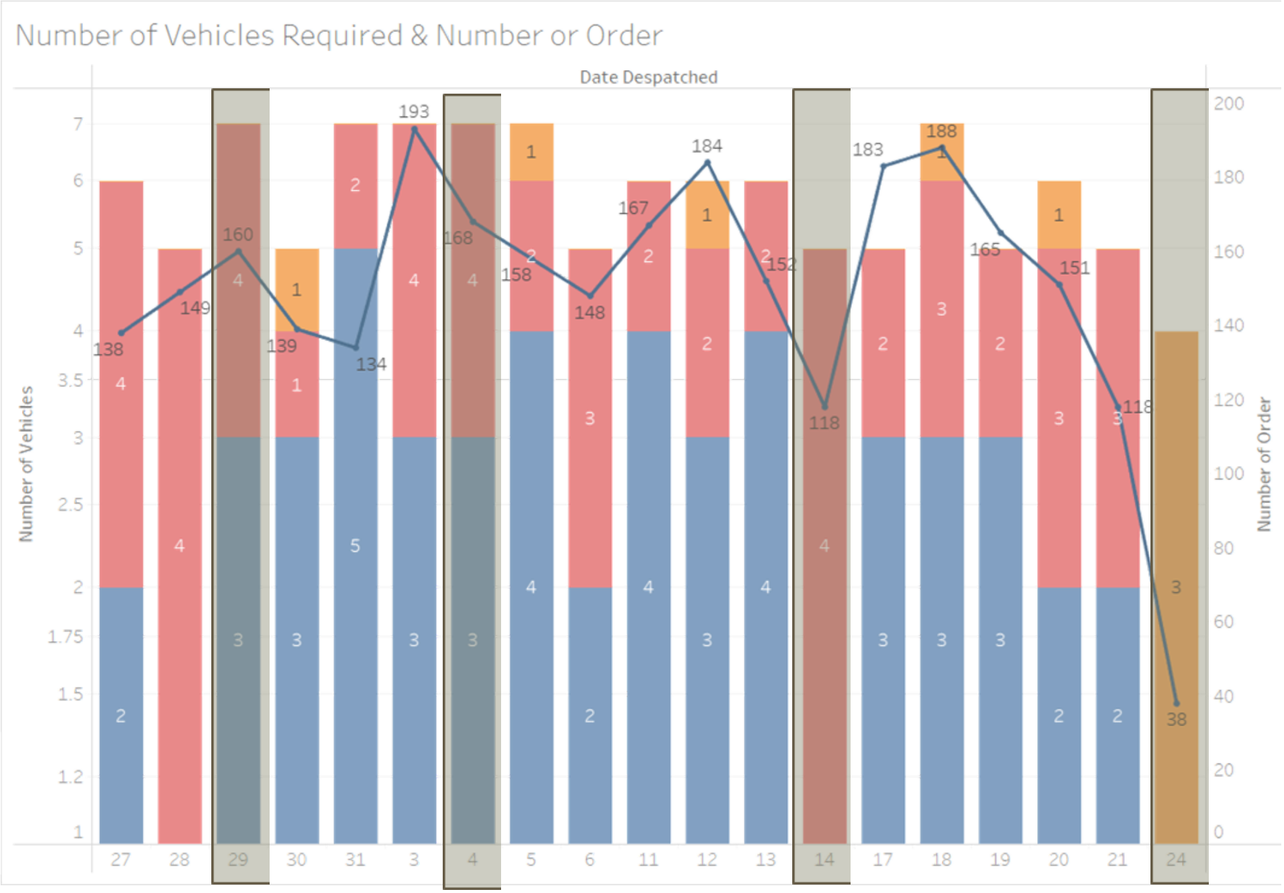
(4) Daily Demand

No. of pallet usage

18-tonne HGV — 5

7.5-tonne LGV — 4

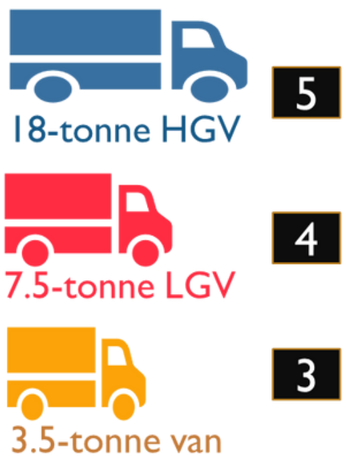
3.5-tonne van — 3



- Consider the pallet capacity, payload and volumetric capacity of each vehicle type

Illustration (con’t)

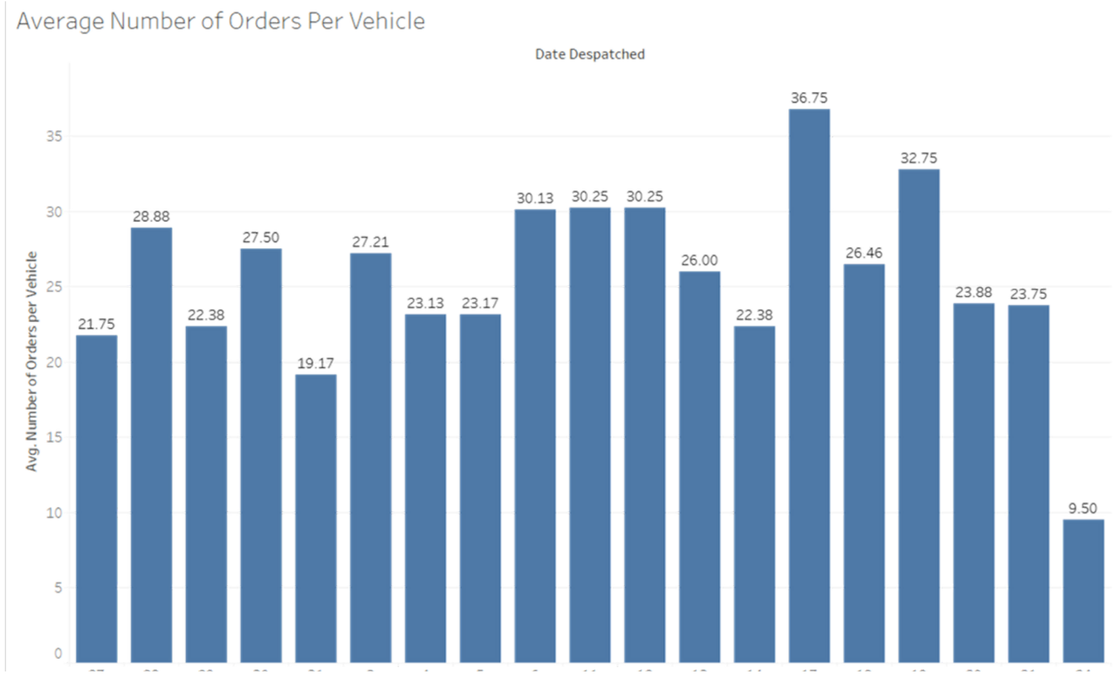
- **Vehicle allocation (shown 4 days as below)**



- Priority: 3.5 tonne van -> 7.5 tonne LGV -> 18 tonne HGV.

Illustration (con’t)

- **Average no. of order per vehicle (delivery driver)**



- Understand what are the daily required delivery by driver (vehicle)
- Based on market data, it is practical for a driver to delivery 40-70 parcels per day, and the maximum and mean number is well within the means of reasonable delivery.

Illustration (con't)

- **In-house delivery cost**

(6) Inhouse Cost

Running cost

+

Standing cost

- Daily running costs based on vehicle usage
- Daily standing costs based on maximum demand

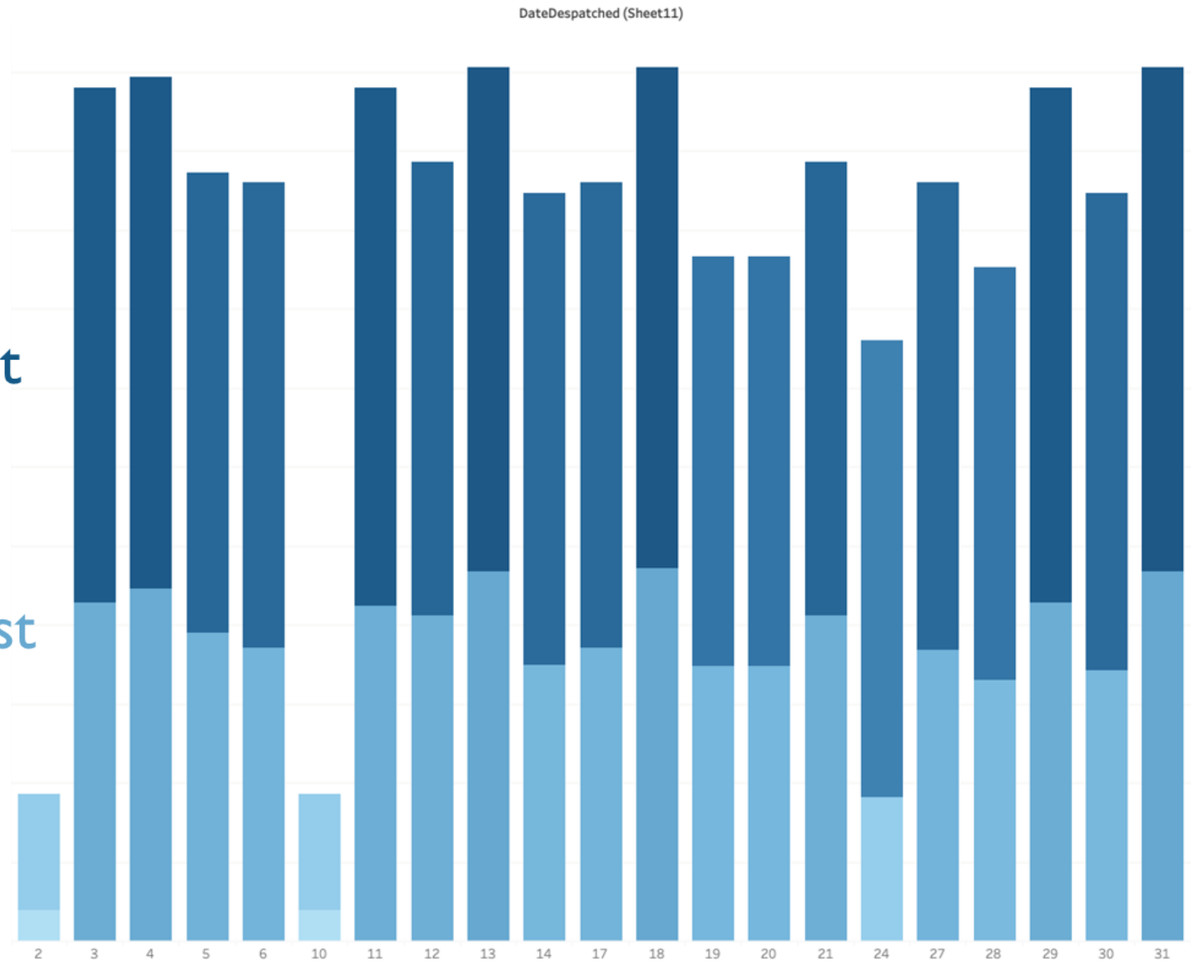
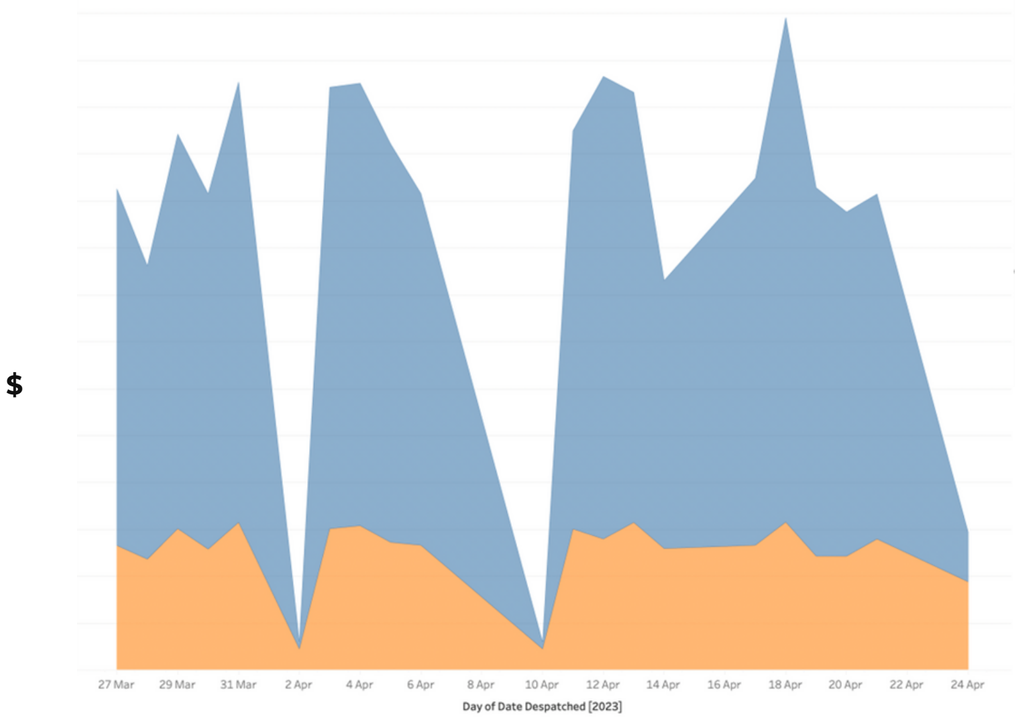


Illustration (con't)

- **Cost saving & sensitivity analysis (30% unutilisation)**



Cost Comparison	
Total Current Delivery cost	A
Total Insourced Delivery cost	B
Total cost saving (A-B)	***xx% > 20%***

Sensitivity Analysis	
Current Delivery cost	A
Insourced Delivery cost (Sensitivity: 30% wastage)	C
Total cost saving (A-C)	***xx% > 20%***