

Michelin Schedule Design

By Kevin Seow

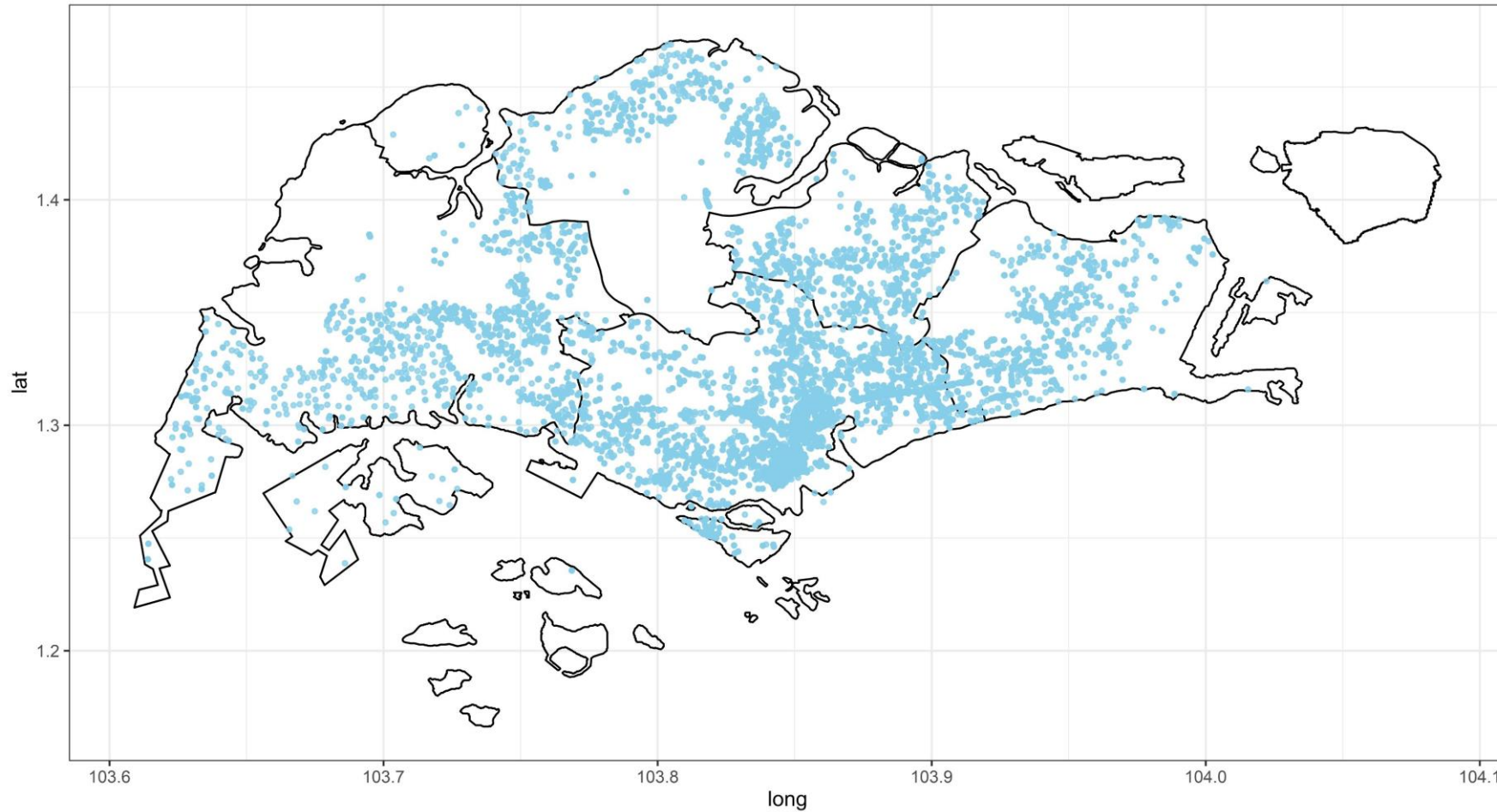
Premise

- Imagine we are Michelin inspectors
- Visit all Michelin Bib Gourmand restaurants to update their ratings
 - Bib Gourmand restaurants tend to be small informal eats, so more inspections can likely be done in a day

Approach

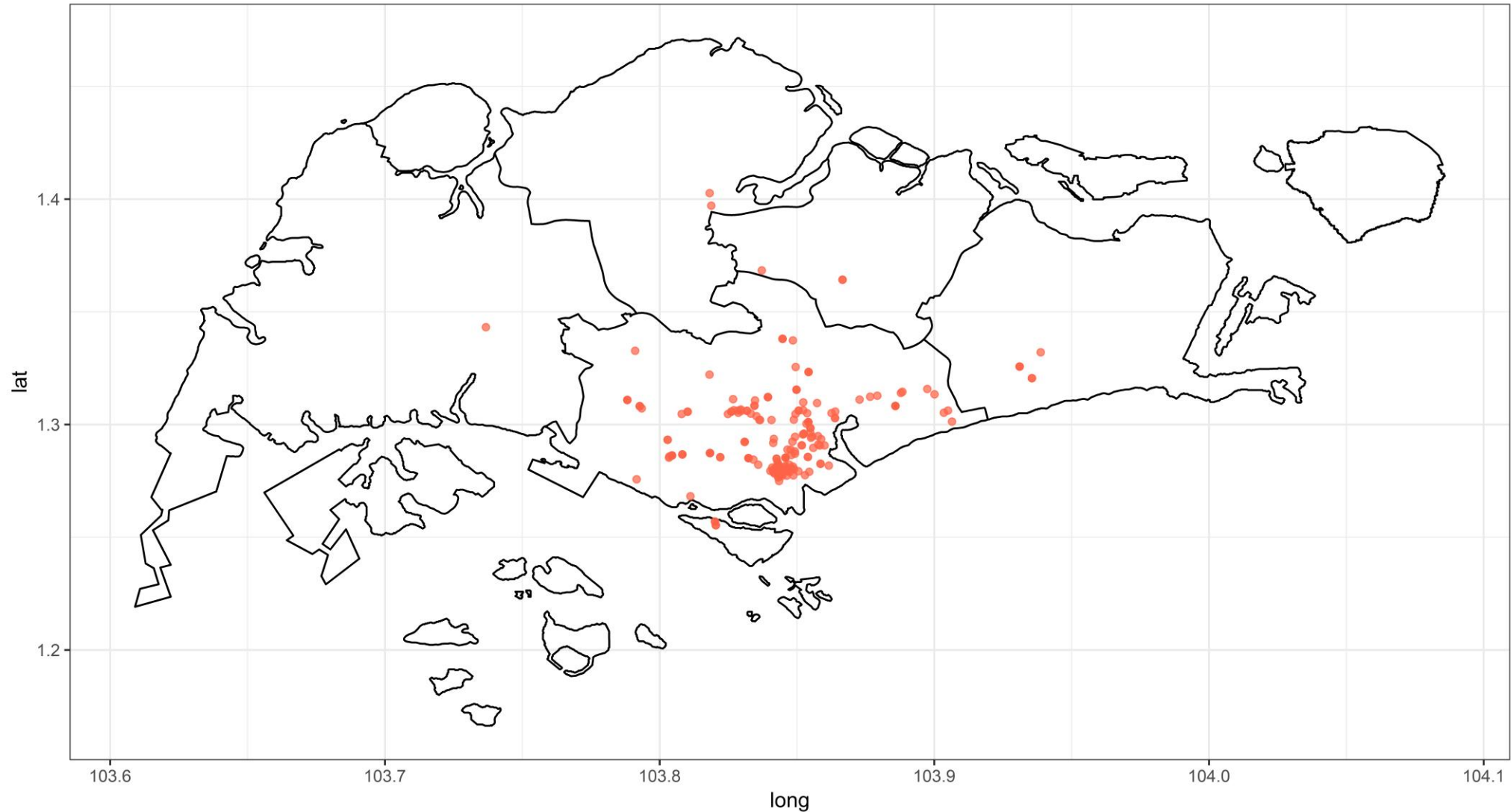
- Design efficient inspection routes for:
 - 5 teams of inspectors
 - Each team covering 11-12 restaurants (keep number of inspections similar)
 - Minimise travelling distance (and time)
- Note: Assume all establishments open; only consider establishments with postcodes

Overview: More than 35k food establishments in Singapore

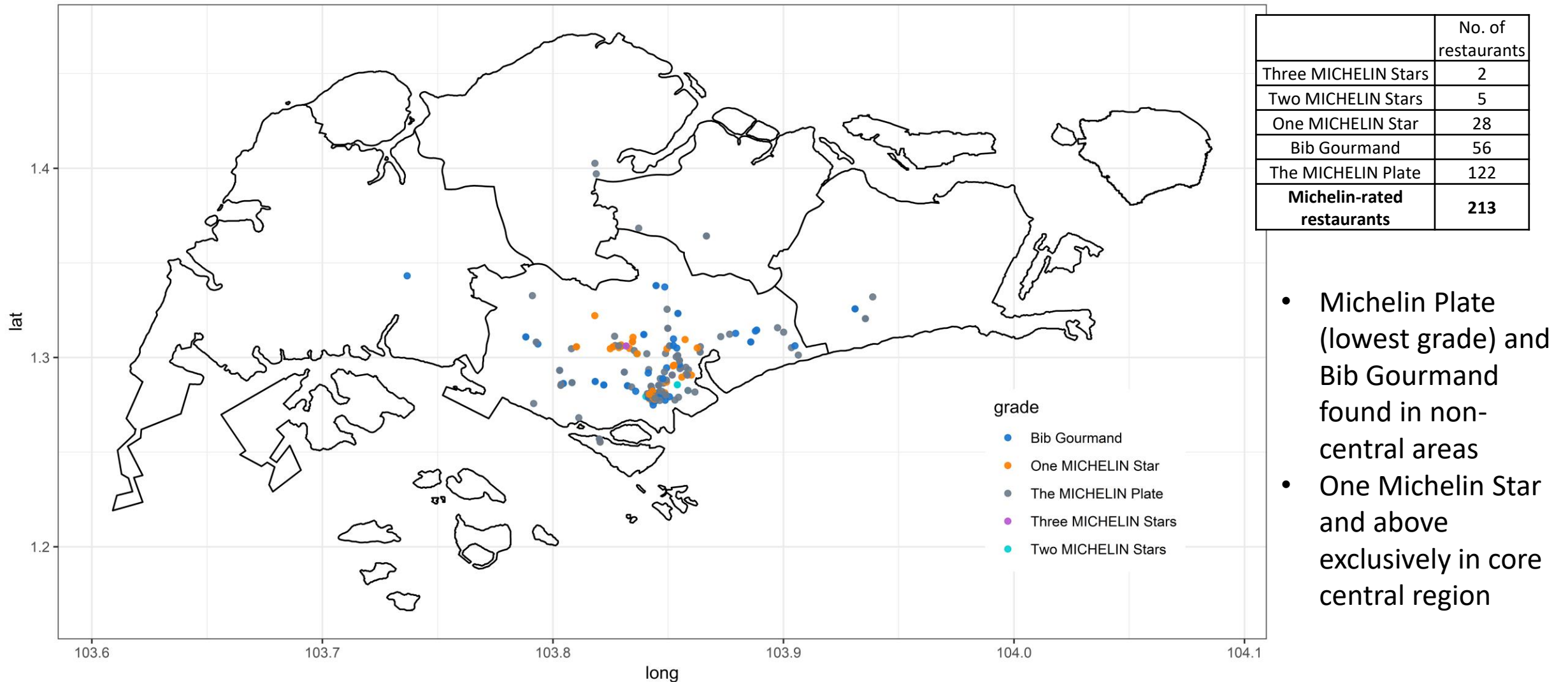


Based on NEA data

Michelin establishments are heavily concentrated in central region

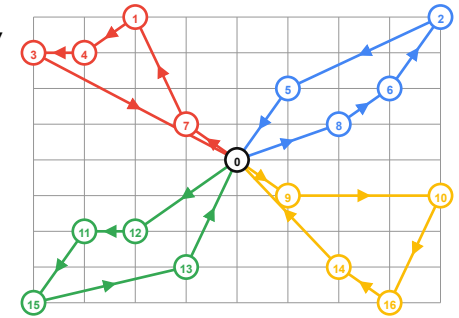


Top-rated Michelin establishments exclusively in central region

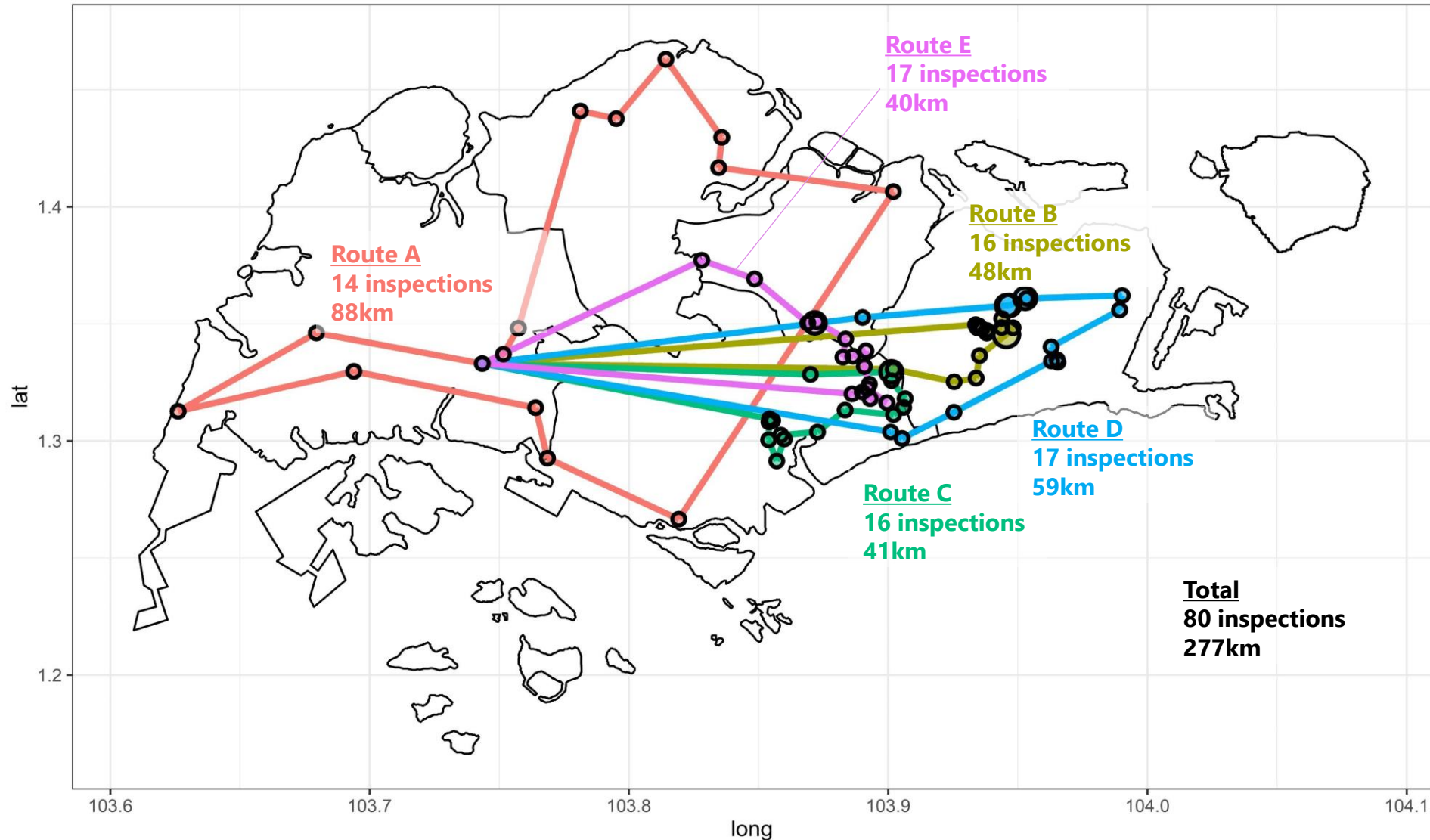


Quick primer on finding efficient routes

- Vehicle routing problem (VRP) –
 - *“How does delivery company minimise distance travelled by its delivery fleet?”*
- Hard to find best optimal solution; algorithms find good solutions
 - 10 locations → 3,629k possible routes
 - 20 locations → 2.43×10^{18} possible routes
- A version of VRP: minimise distance travelled by fleet, while accounting for capacity of each delivery vehicle
- Similar to our objective: limit number of inspections by team, while reducing travelling distances (and time)



Inspection routes for Bib Gourmand



Notes:

1. All routes start and end at Bishan (since it's in the middle of Singapore)
2. Distance based on geographical distance (Euclidean) between points; location coordinates from OneMap API
3. Size of marker indicates number of establishments at each postcode

Possible Refinements

- Use road travel instead of geographical distance to measure distance between locations
 - OneMap, Google Maps

