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21–25 October

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Smart urban freight

Transforming Freight Movements through ITS – Part III (SIS35)

Chiu Wen Tung

Urban Redevelopment Authority

ABOUT URA

- Singapore's national planning and conservation authority

- Mission: To make Singapore a great place to live, work and play in

- Land Use Planning
- Urban Design
- Development Control
- Government Land Sales
- Conservation of Built Heritage
- Place Management of Key Areas

In 2018, Singapore imported

There are over

making up 17% of the total vehicle population.

On average, a goods vehicle travels 2 times the distance of a private car.

Why freight is important for planning

1. Impact on Road Traffic

- *Higher road usage contributes to road congestion*
- Goods and Other Vehicles comprise 17% of total vehicle population in Singapore

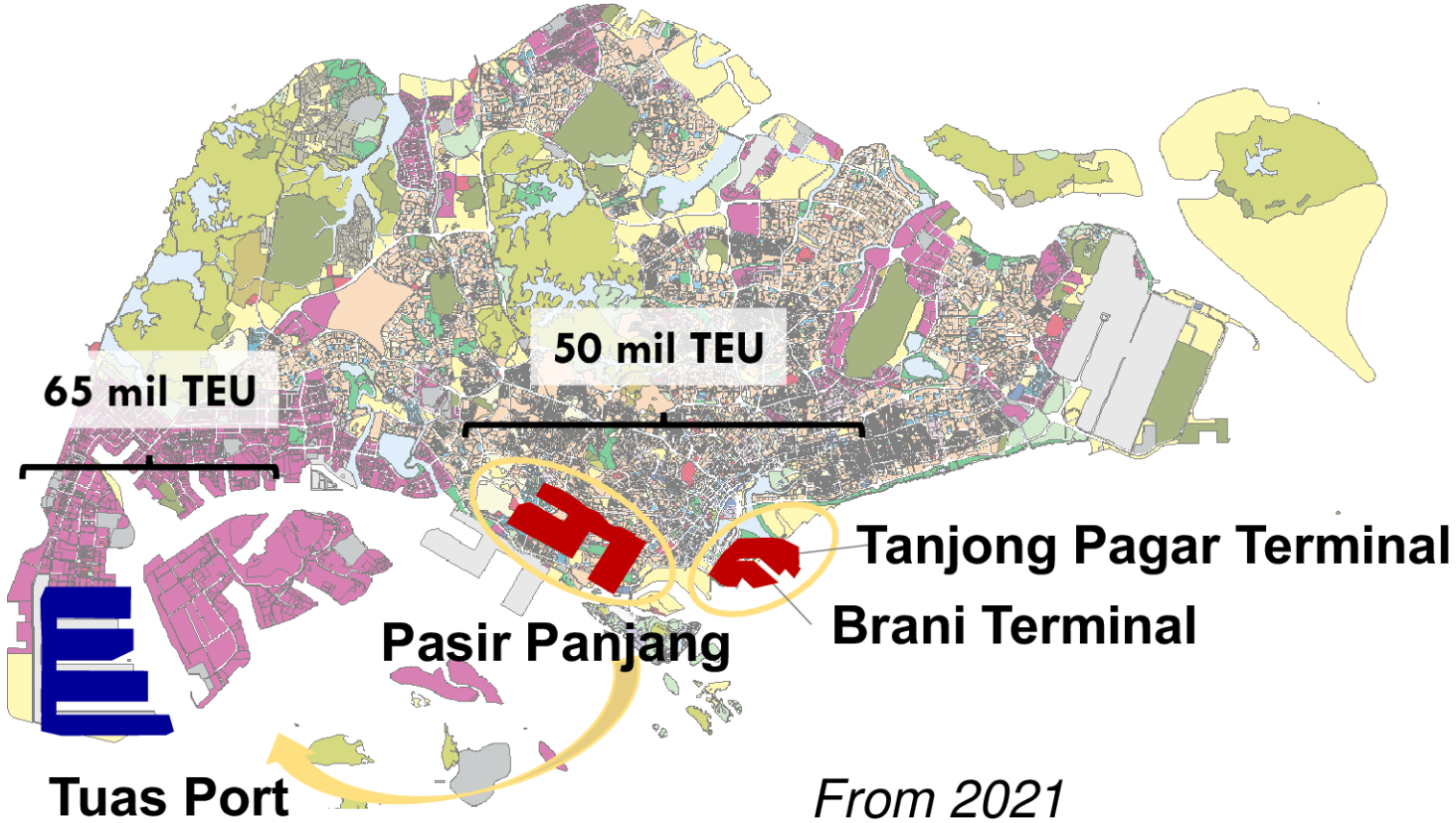
2. Impact on Land Demand

- *Unsustainable growth of transport infrastructure to cater to goods movement*
- Transport currently takes up approximately 8,000 ha of land (**12.5%**), as compared to Housing at 10,000 ha (16.6%)*

3. Impact on Infrastructure

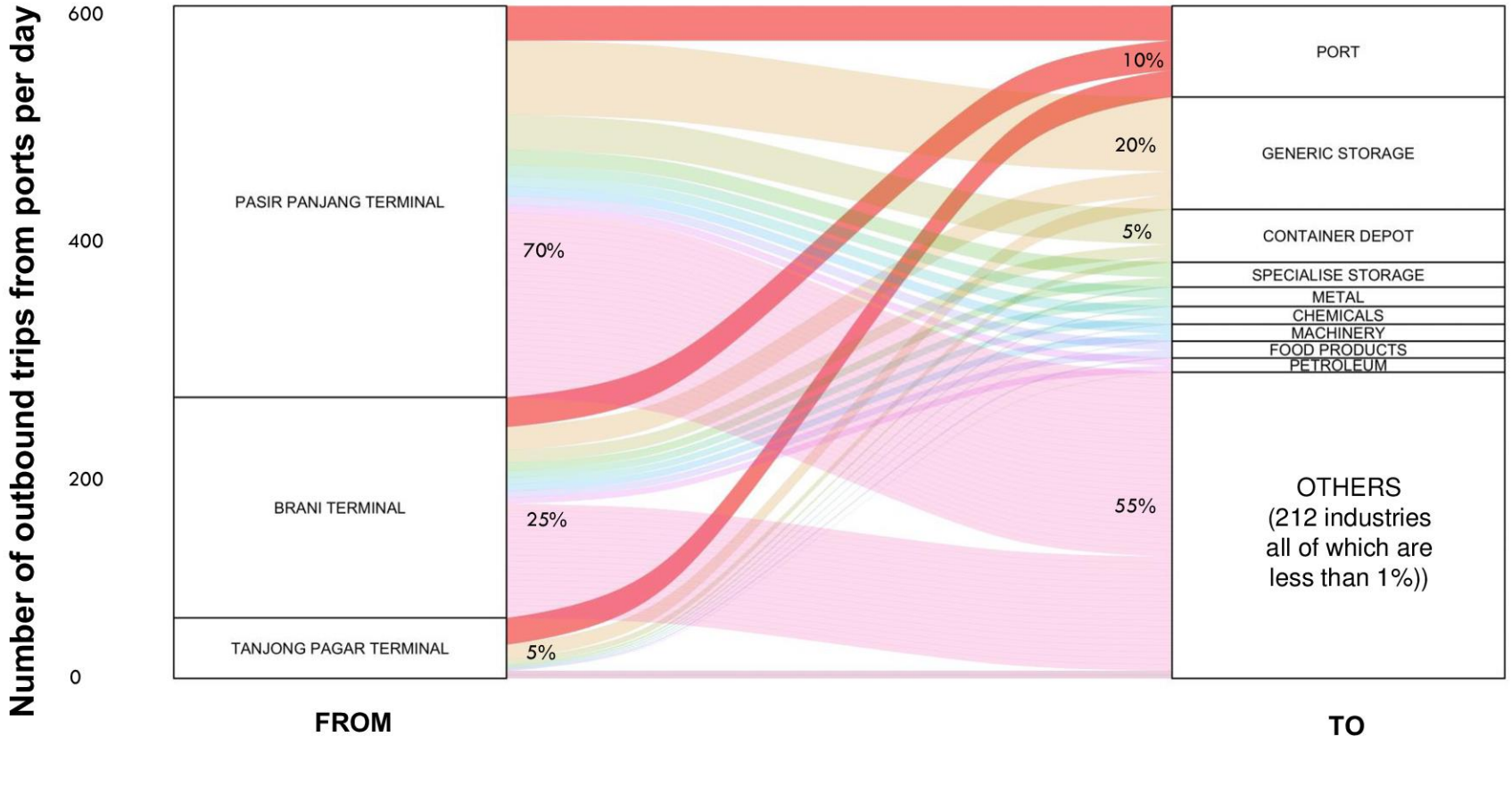
- *Insufficient freight infrastructure results in long queueing time and traffic congestion for freight generators*
- Freight generators (e.g. construction sites, shopping malls) are located in almost all planning areas.

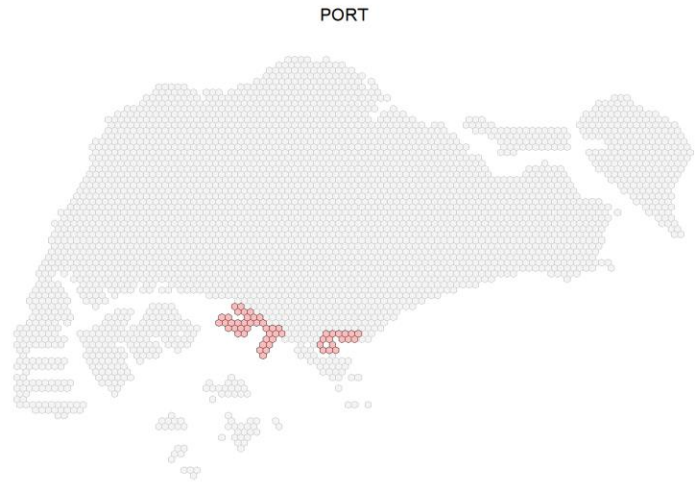
Case Study 1: Port-Industry analysis



- With port consolidation, there is scope to cluster synergistic industries in Tuas port

1st stop of outbound container truck trips from different terminals – by industry type (SSIC)

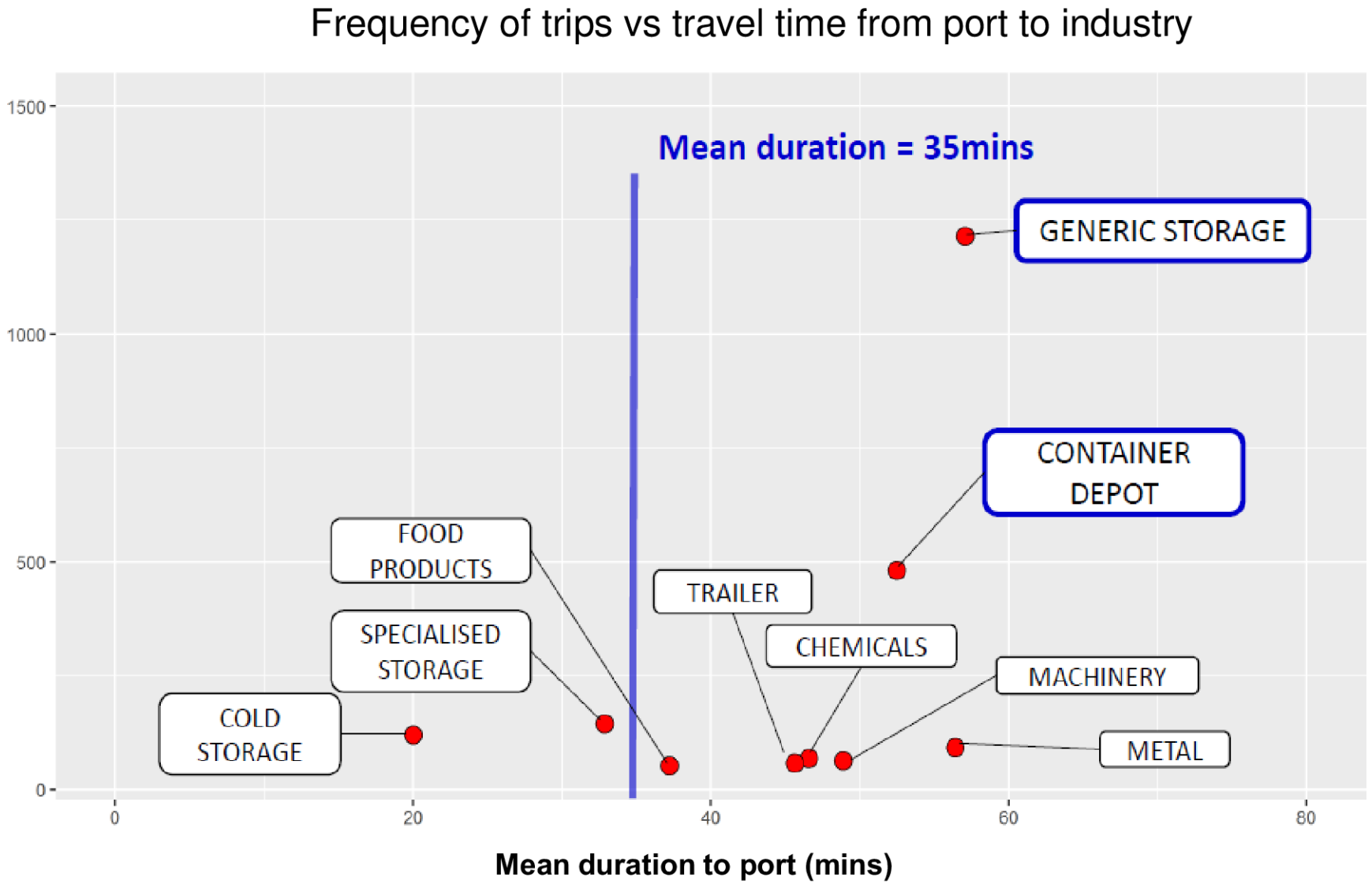




- Industries with the highest freight trips from the Port are Generic Storage, Container Depot, Specialised Storage, Metal, Chemicals, Machinery, Food and Petroleum industries
- These industries are mostly located in the Western Region

Trip frequency and duration by industry type (Import)

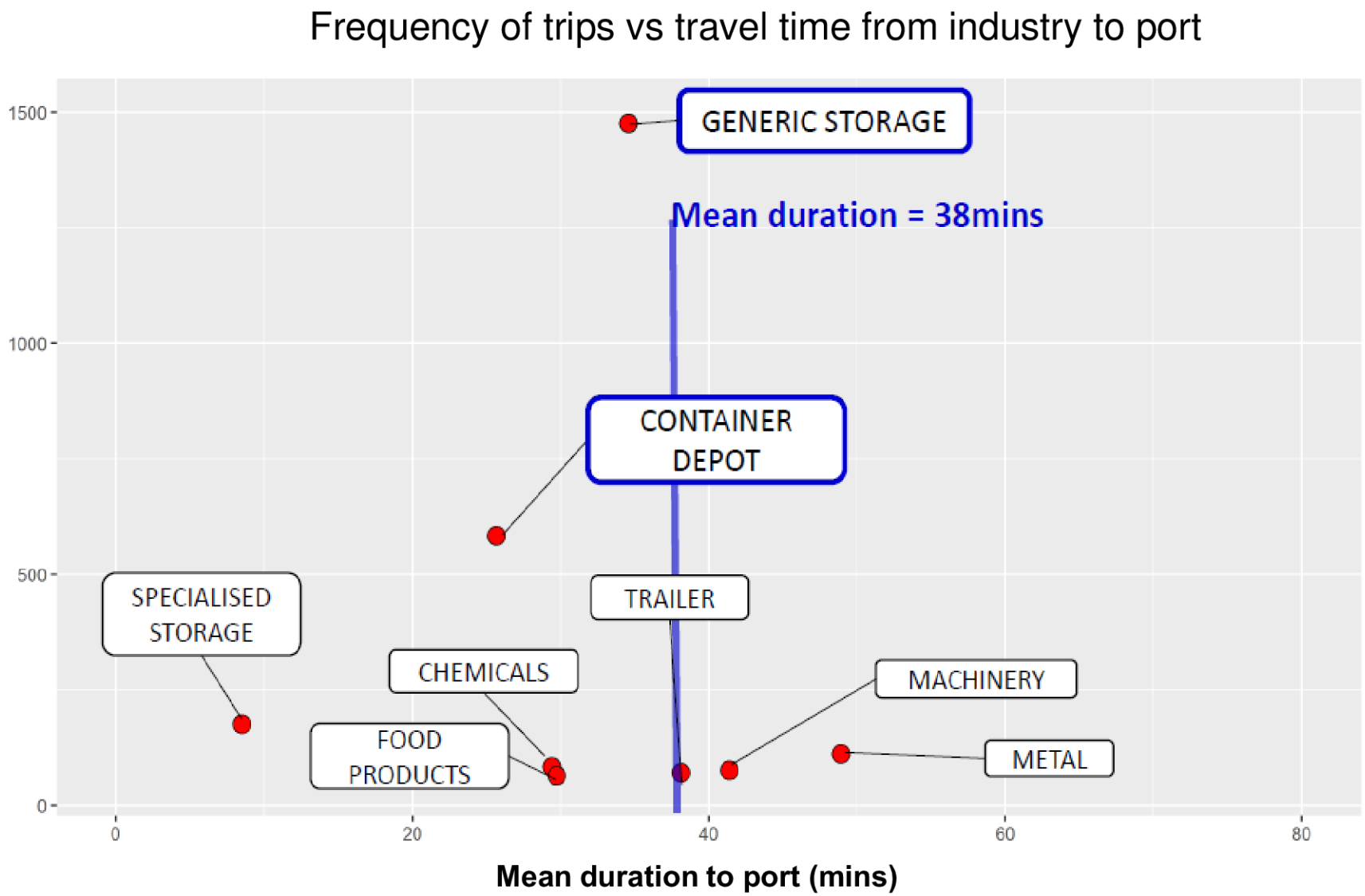
Daily outbound trips from port per day (import)



- Generic Storage and Container Deport – highest trip frequency from the port (import)

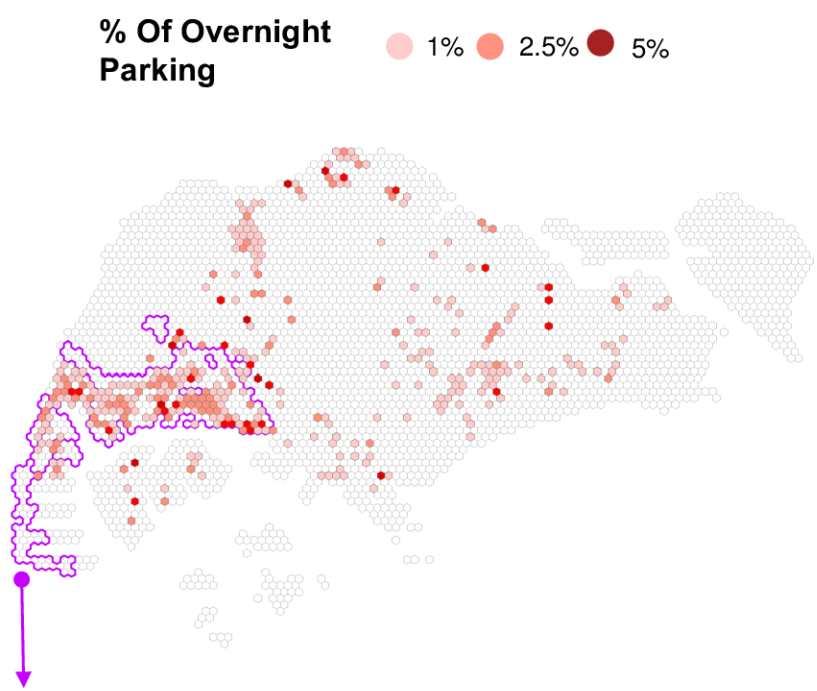
Trip frequency and duration by industry type (Export)

Daily inbound trips from port per day (export)



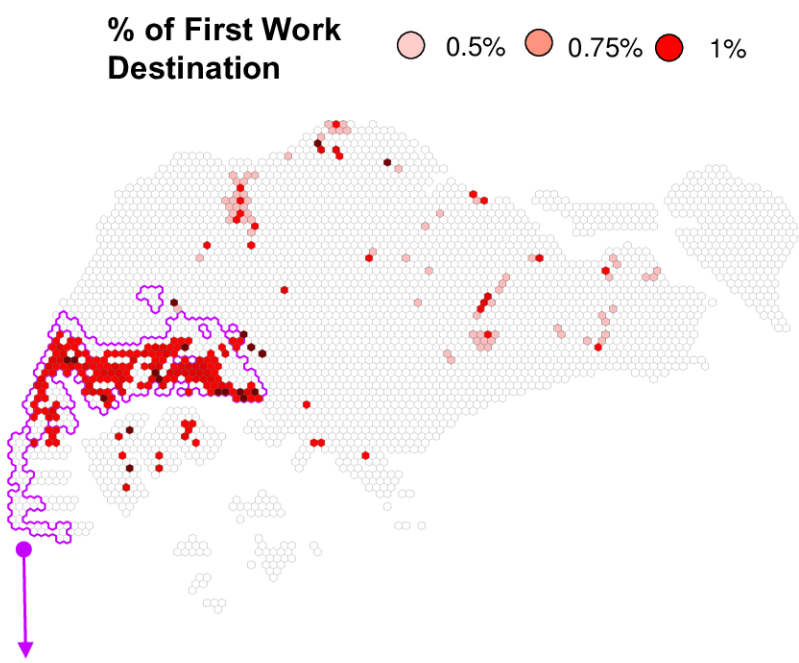
Savings in freight traffic

Overnight parking location



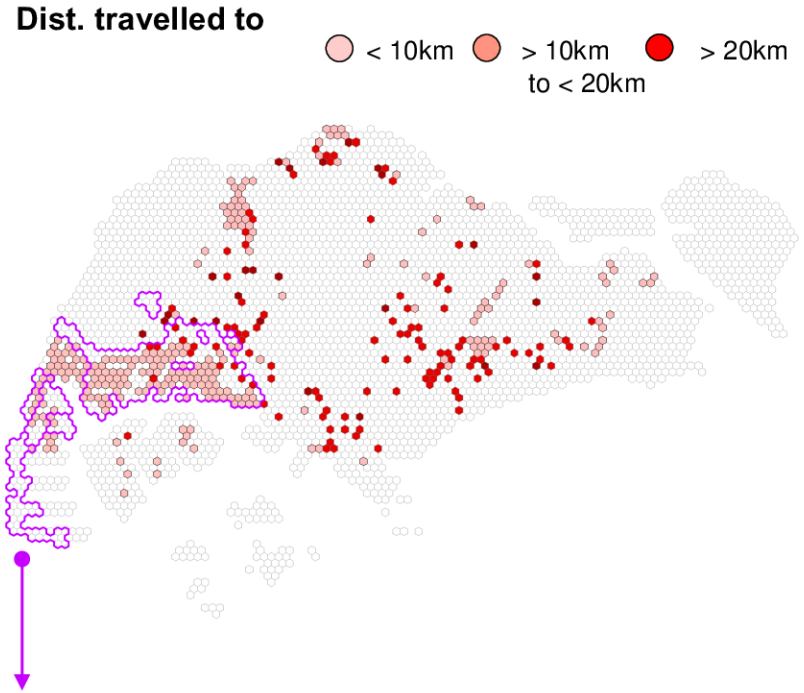
40% of overnight parking were in western industrial estates

First work destination



83% of first destination were in western industrial estates

Distance travel to first work destination (between 7am to 10am)

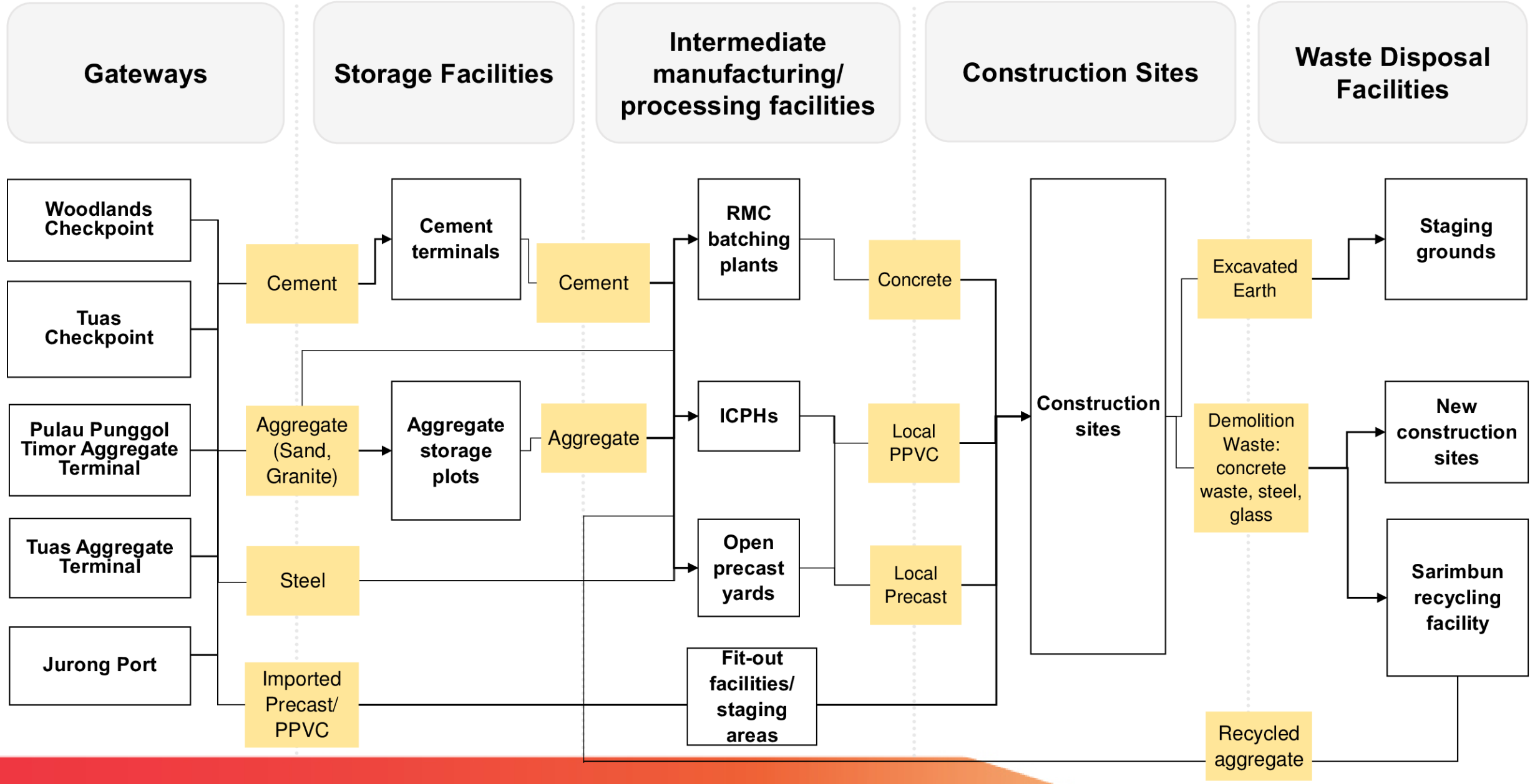


Container vehicles travel **10km less** if both the parking lot and first work destination are within the western industrial estates

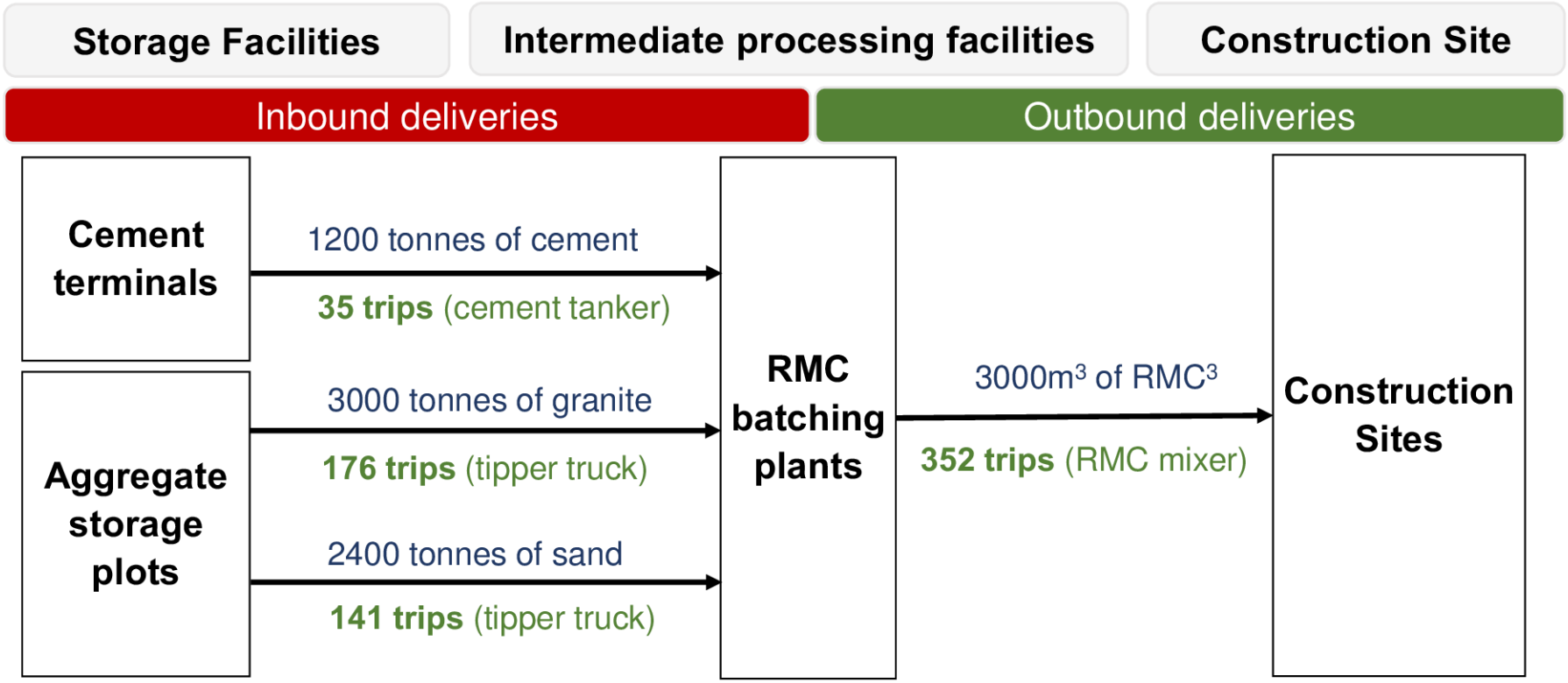
Case Study 1: Port-Industry analysis – Key findings

- The Generic Storage and Container Deport industries have the highest trip frequencies from the port.
- These industries are already mostly located in the western region.
- Container trucks travel 10km less if both parking lot and first work destinations are within JTC western estates.

Case Study 2: Construction freight



Construction freight trip generation



Resource parameters used[1]

1m^3 of concrete consists of:

- 400kg of cement
- 1000kg of granite
- 800kg of sand

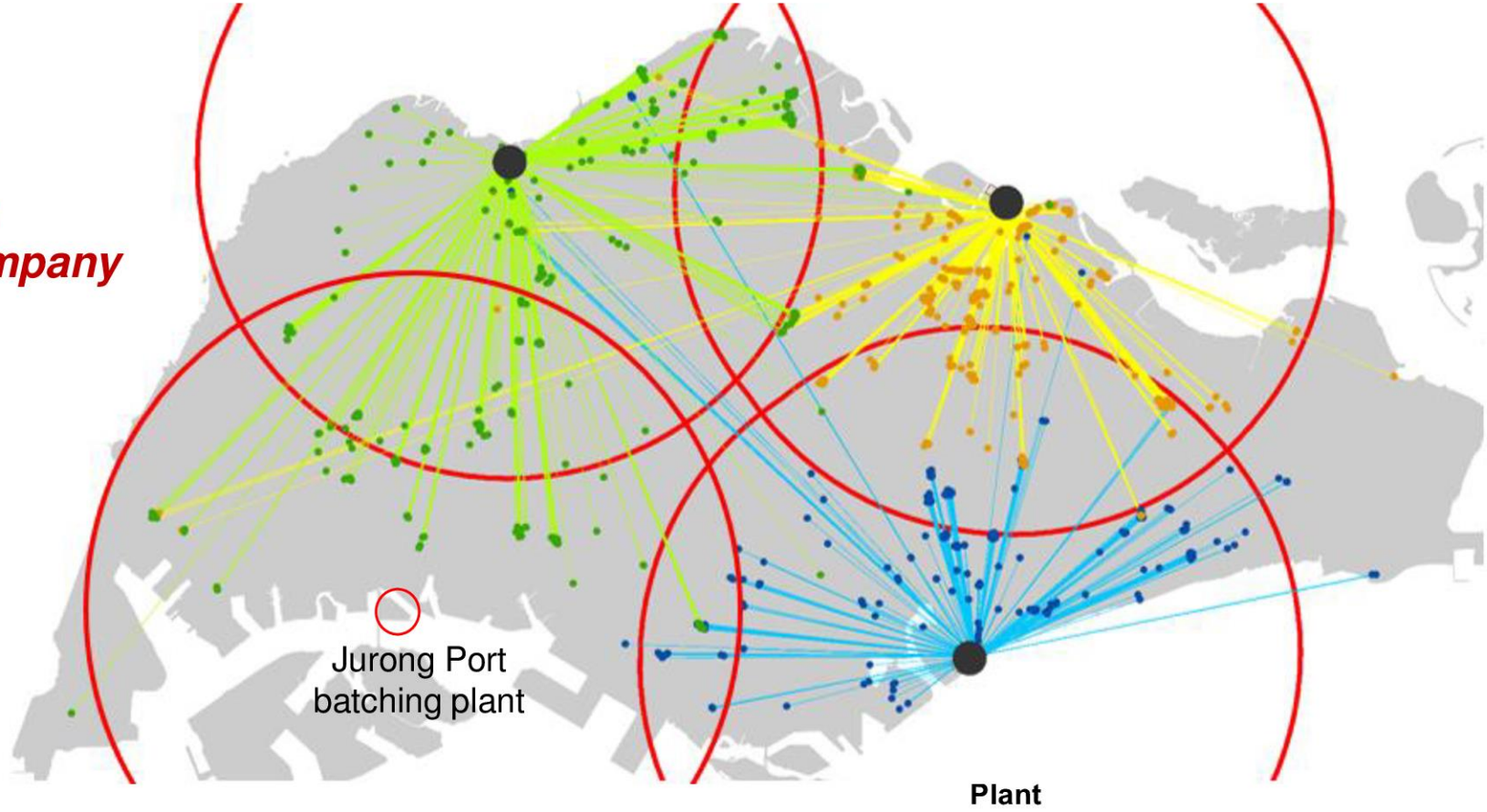
Freight parameters used[2]

- Each RMC mixer carries 8.5m^3 of concrete
- Each cement tanker carries 34 tonnes of cement
- Each tipper truck carries 17 tonnes of granite/sand

[1,2] Information from engagements with RMC operators

Ready-Mix Concrete (RMC) batching plant coverage

GPS data from a construction company



- RMC has 2-hr shelf life
- Translate to 10 km delivery radius

~105 vehicles

Case Study 2: Construction freight – Key findings

- For RMC plants, in-bound and outbound trips are similar in number
- Co-locating RMC plants near landing points and stockpiles reduces freight trips and allow for automation of processes
- RMC mixers have a limited shelf life of ~2 hours -> need for adequate island-wide coverage to serve construction sites

THANK YOU


Smart Mobility,
Empowering Cities