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# SMiLES

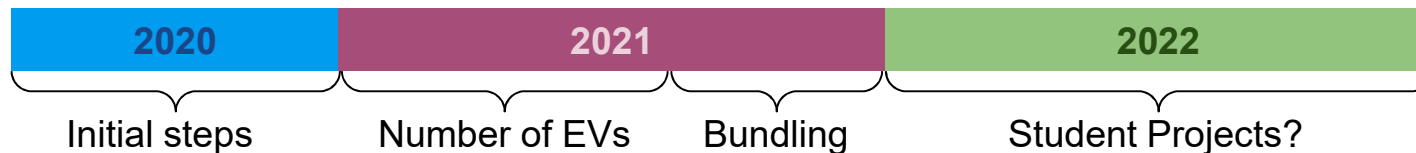
## ZE transport & bundling concepts

**8 December 2021**



# Introduction

- › SMiLES research project
- › Two studies:
  - Minimum number of electric vehicles for deliveries in ZE zones
  - Bundling concept





# Research electric vehicles

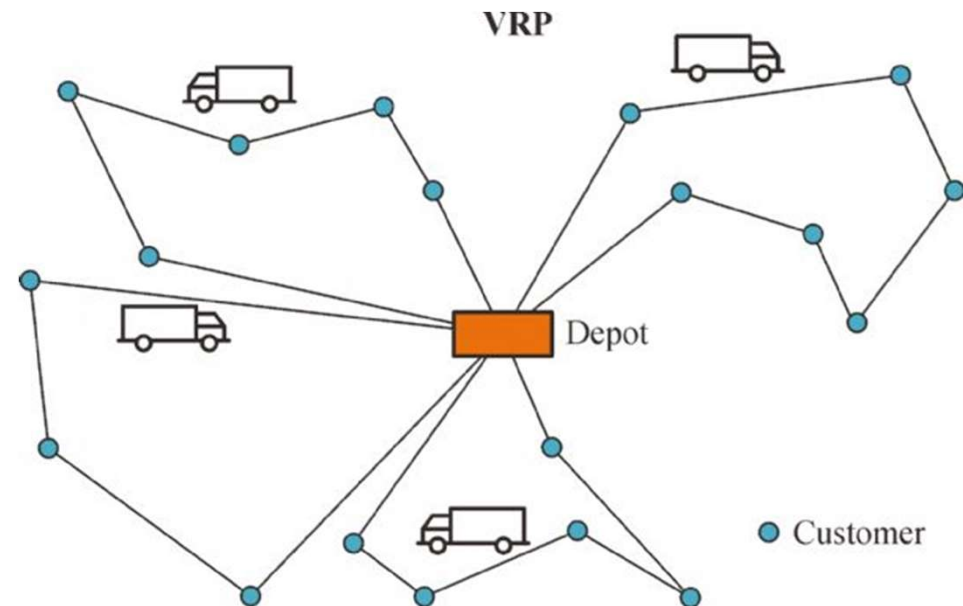
## Research question:

What is the minimum number of vehicles needed in a zero emission zone?

## Method:

Mathematical modelling with vehicle routing heuristic. This heuristic searches for **best possible routes** to visit all customers with multiple vehicles from a single depot.

- Constraints: **time windows of customers** and division in demand of fresh and frozen products.
- Objective: **minimize the number of vehicles used and the distance travelled.**





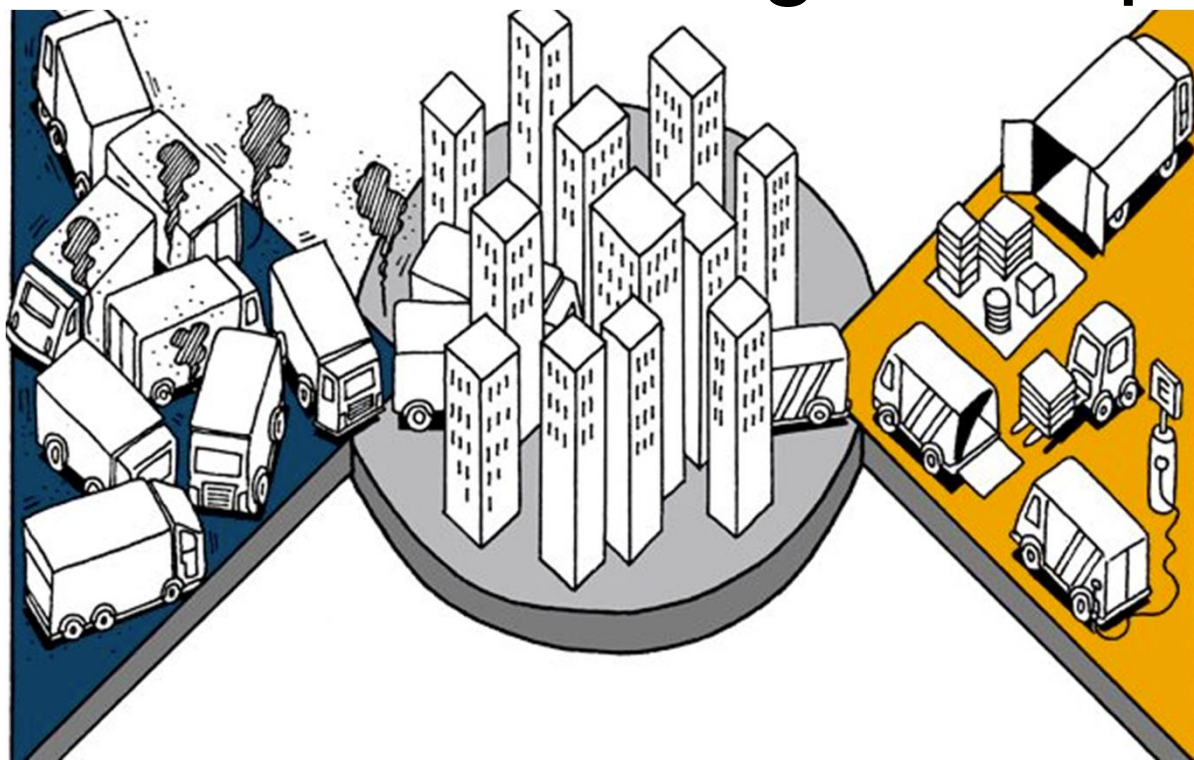
# Research electric vehicles

Minimum number of electric vehicles determined based on three scenarios:

- > Current situation
- > Current situation + new customers
- > Current situation + new customers + demand forecast



# Introduction bundling concept





# Research goal bundling concept

- › Investigate attitude of horeca and suppliers towards bundling concept
  - › Find possible 'must haves' and issues regarding the concept
  - › Get an idea of volume increases
- Several interviews were conducted with horeca & suppliers and some data analysis on the volumes was done



# 22 interviews conducted

16 hotels and restaurants  
6 suppliers  
(in downtown Groningen)



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# Results Horeca





# Positive attitude towards bundling

All interviewees have a neutral or positive attitude towards bundling of their deliveries. Most (9 of 16) were very positive, even calling it an ideal situation.

- › Very convenient due to less handling during the day.
- › They give priority to getting products delivered, not to who delivers it.



# Concerns about bundling

Generally interviewees are positive, but some ...

- > wonder about the feasibility of the concept (7 of 16),
- > question the sustainability of the concept (2 of 16),
  - . Additional packaging to keep products fresh because it takes more time to bring it to the restaurants (for example bread).
  - . “I don’t believe this concept changes anything considering sustainability”.
- > are afraid of a monopoly position of the transport company, preference for white label (3 of 16).



# Must haves for bundling

Most frequently mentioned 'must haves':

- › Delivery before a customer-specific time (11 of 16)
- › Products should not become more expensive (7 of 16)

Other:

- › Getting everything neat and orderly delivered (4 of 16)
- › Clear communication loops (4 of 16)
- › Daily delivery of products from other suppliers must be possible, even if the transport company currently delivers less frequently (also small amounts) (2 of 16)
- › HACCP (2 of 16)



# Other points raised by interviewees

- > “It’s a more serious problem if all products are too late instead of only one supplier being late.”
- > “Is everything being bundled into the same crates to avoid half empty crates?”
- > “Is it still possible to contact a supplier in case I forgot to order a product?”
- > “Who to contact when a product is missing?”
- > “Is a backorder delivery still possible?”



# Total delivery volume per customer

Average volume increase when bundling all goods  
 of all suppliers of interviewed restaurants and  
 hotels:

**116%**



# Delivery volumes per category

Average volume increase when bundling all goods of all suppliers of interviewed restaurants and hotels per category:

|                    | <b>Frozen</b> | <b>Fresh</b> | <b>Ambient</b> |
|--------------------|---------------|--------------|----------------|
| Average % increase | 9%            | 231%         | 253%           |



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# Results Suppliers



# Positive attitude towards bundling

All interviewees are open to the bundling concept:

- › “Makes it easier, saves time and probably money.”

However, one interviewee has some question marks:

- › Afraid to lose their identity since they are not able to distinguish themselves by means of service.
- › Loss of control over delivery process.





# Must haves for bundling

Most frequently mentioned 'must haves':

- › Deliveries on time according to customer wishes (4 of 6).
- › Clear agreements on how to deliver the products to the customers (4 of 6).

Other:

- › Crates must be returned immediately (2 of 6).
- › HACCP (2 of 6).
- › Payment on delivery must be possible (1 of 6).
- › Must not become more expensive (1 of 6).



# Other points raised by suppliers

- > “How to deal with complaints?”
- > “Who is responsible for each stage of the proces?”
- > “Food safety is important during the consolidation and temporary storage.”
- > “What is the latest arrival time at the hub? The earliest I can arrive is around 8:30am.”



# Strategic questions for the future

- › Which suppliers are most suitable to integrate in a bundling concept?
  - Larger suppliers tended to raise more concerns.
  - More efficiency gains are possible when integrating smaller suppliers.
- › Is inclusion in the bundling concept dependent on the location of the customers and/or suppliers?
- › Should Ambient products be delivered separated from Fresh and Frozen?



# Strategic questions for the future

- > Transparency of costs - which part of the costs is for the logistics?
- > Who is responsible for service problems (manco, spoiled food, late delivery,...)?
- > Contract between which parties?
- > Is it an 'open network', with predetermined pricing, or based on individual price negotiations?