Leslie Sheng J.

VRP applied in waste collection logistics

@NordConsNet Workshop 2017

optimisation

optimization | ɒptɪmʌɪ'zeɪʃ(ə)n | (also **optimisation**)

noun *[mass noun]*

the action of making the best or most effective use of a situation or resource: *companies interested in the optimization of the business* | *[count noun] : the developers know many optimizations can be made.*

guess

resources

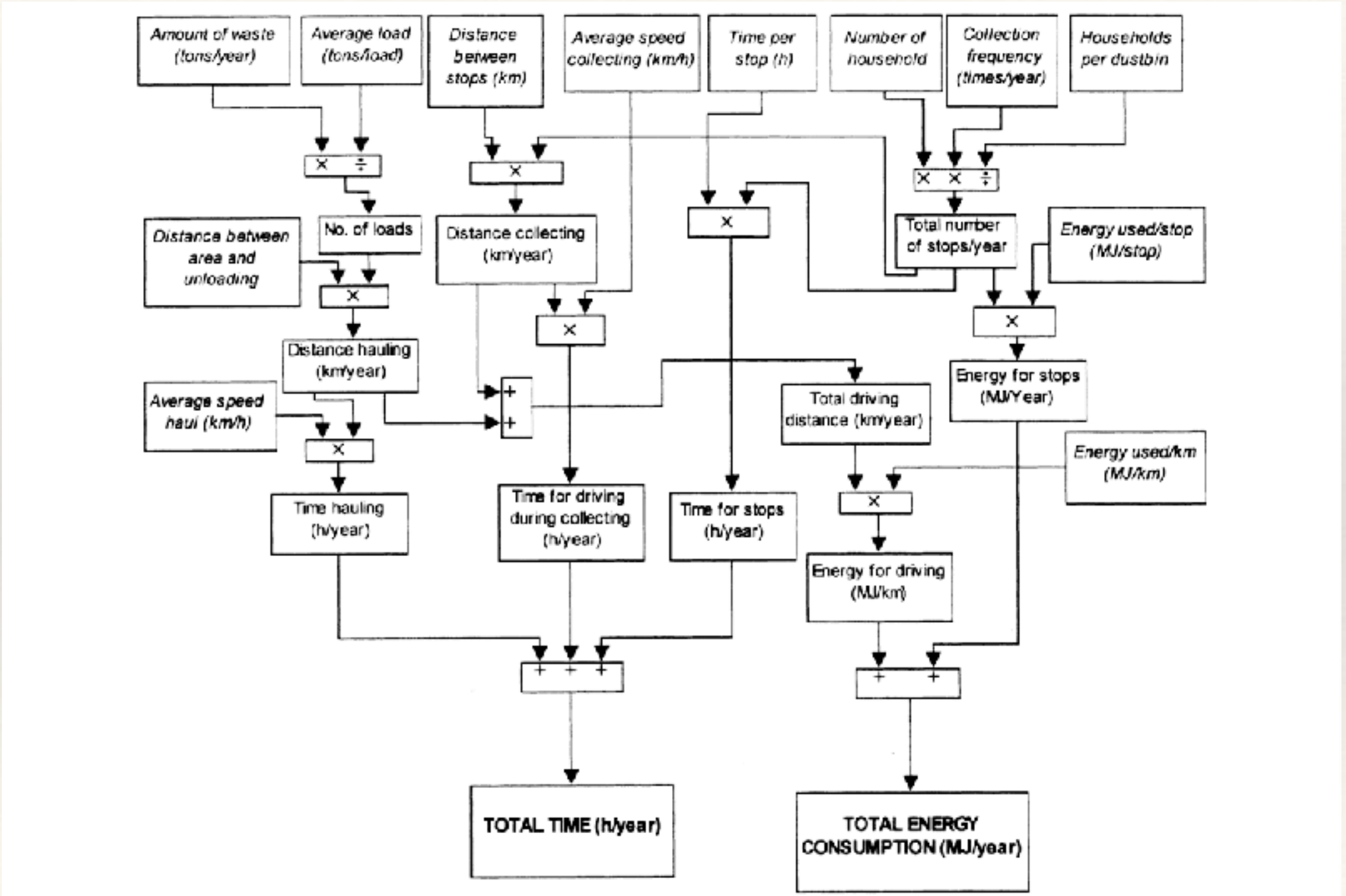


Fig. 2. The collection transport model. Boxes with text in italics are input data parameters, the two boxes with bold capital letters are the results from the model.

Sonesson et al 2000

experimental policies

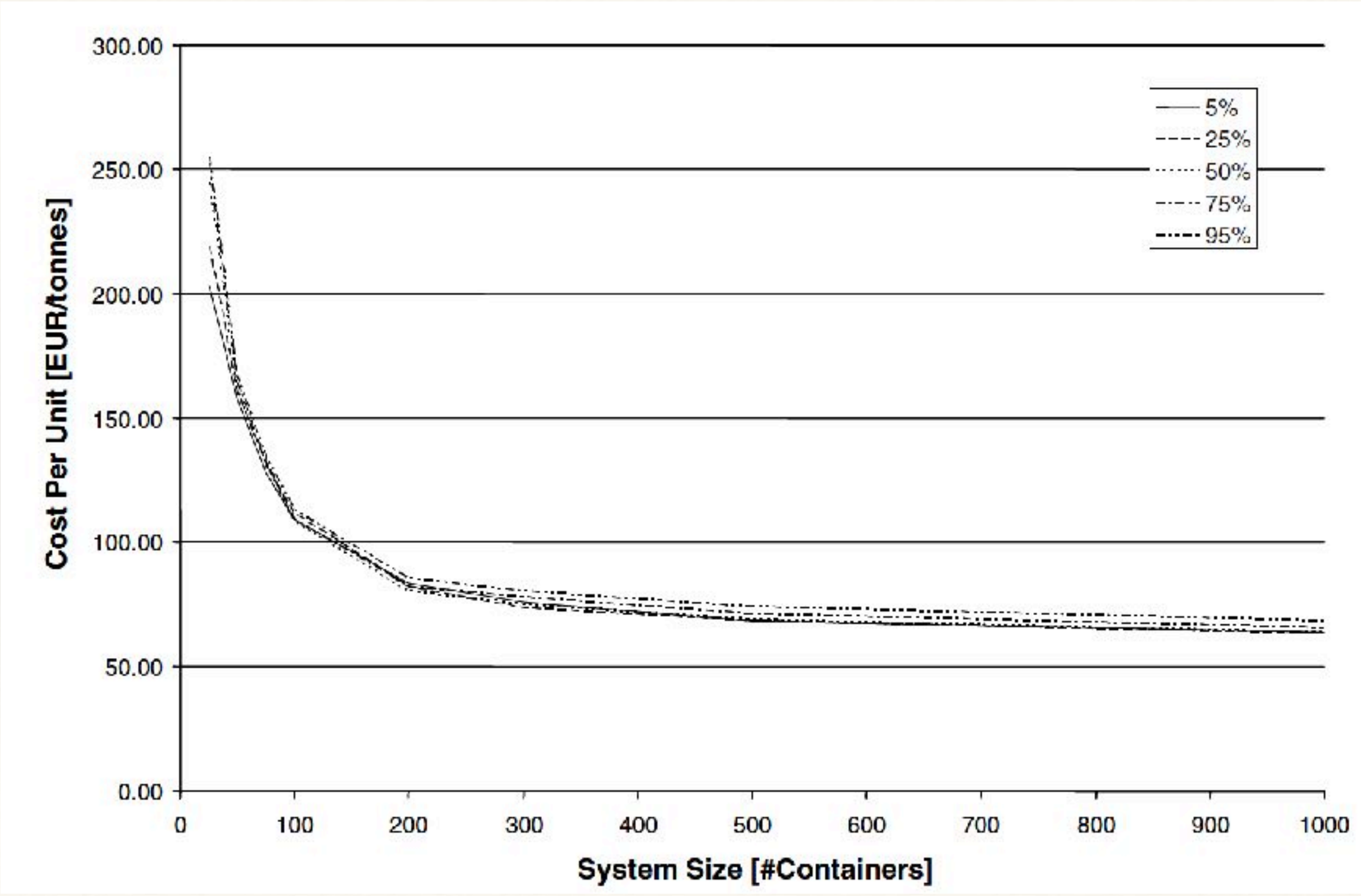
Policy 1: Static scheduling and static routing

Policy 2: Dynamic scheduling and dynamic routing to full containers

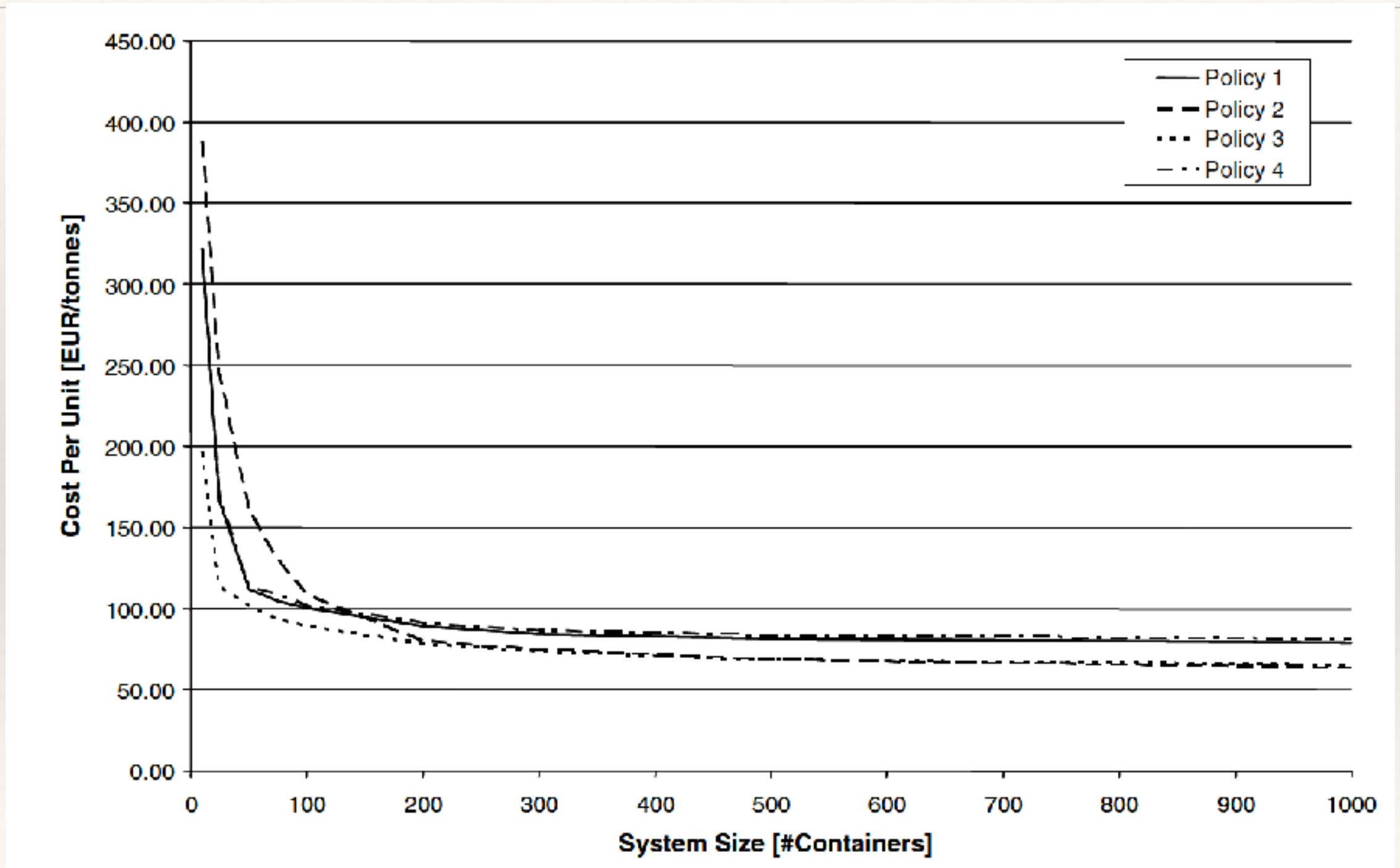
Policy 3: Dynamic scheduling and dynamic routing to “almost” full containers

Policy 4: Static scheduling and dynamic routing to “almost” full containers

when last tried



optimum


450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Cost Per Unit [EUR/tonnes]
0
100
200
300
400
500
600
700
800
900
1000
System Size [#Containers]
Policy 1
Policy 2
Policy 3
Policy 4

fact-check

The level sensors are no longer in use and the logistics is done in the traditional way, i.e. with fixed collection frequencies. The intention of the sensors was never to improve the logistics, but to check the quality of the operator responsible for the collection

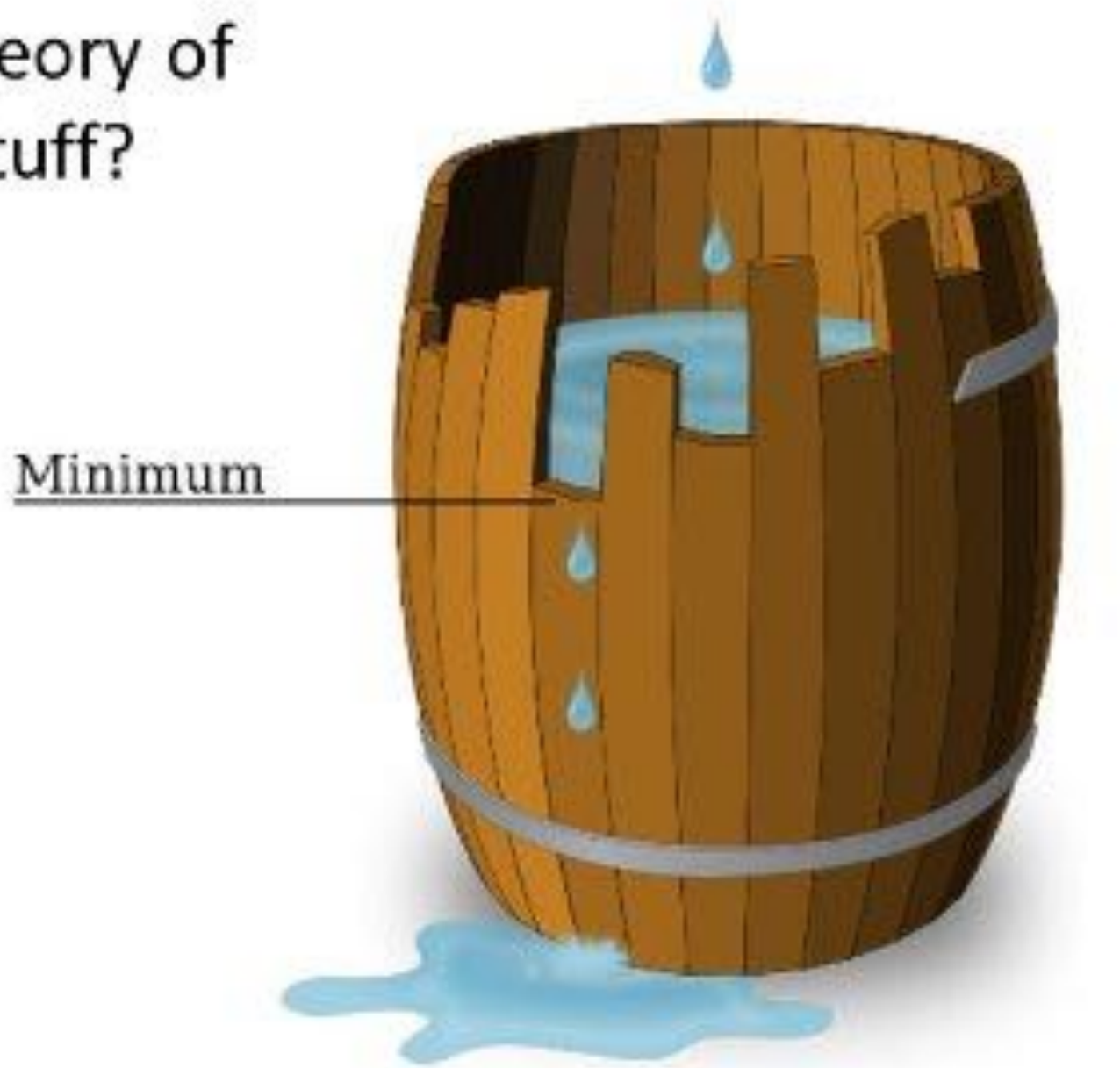
we simplify


A320


AIRBUS A350 XWB


A350 XWB
r films / H. GOUSSÉ

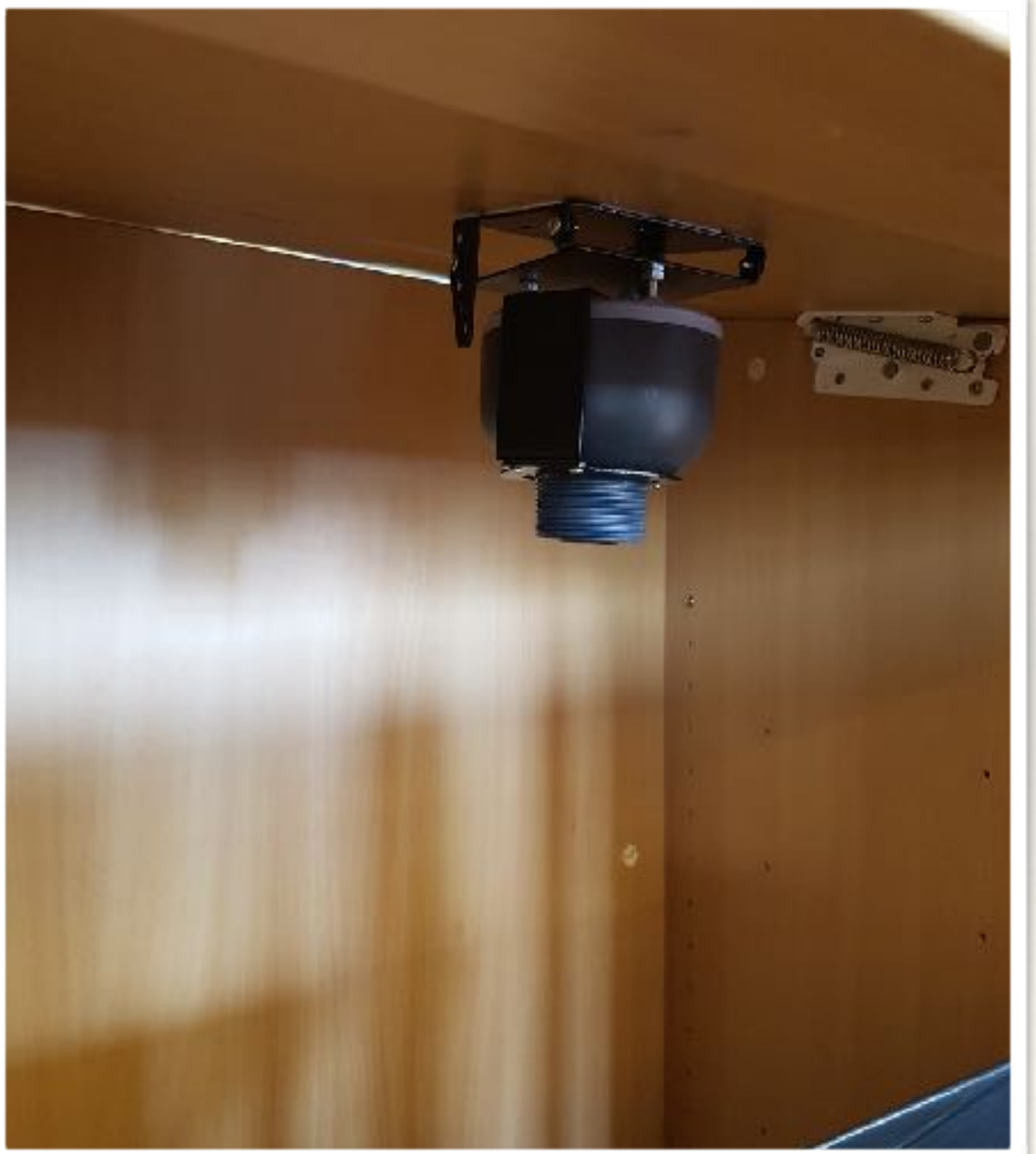
‘What is This Theory of Constraints Stuff?



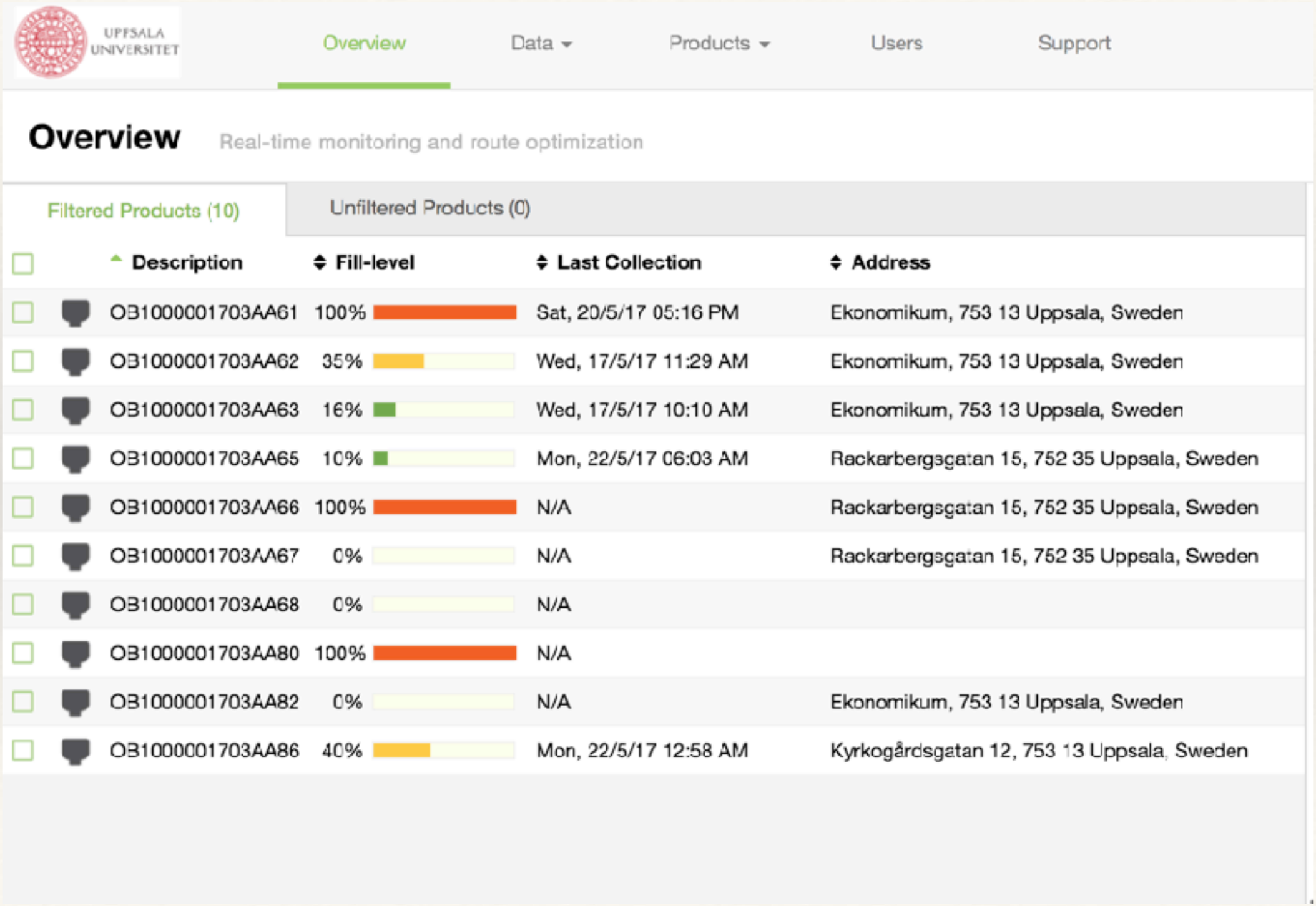
“Liebig’s Barrel”
from Wikipedia on
“Liebig’s Law of the Minimum”

demo

- ultrasonic sensor
- pilot test in Ekonomikum
- understand the essential of waste data
- again, keep it simple



any ideas?


UPPSALA UNIVERSITET
Overview
Data
Products
Users
Support
Overview
Real-time monitoring and route optimization
Filtered Products (10)
Unfiltered Products (0)
Description
Fill-level
Last Collection
Address
OB1000001703AA61 100% Sat, 20/5/17 05:16 PM Ekonomikum, 753 13 Uppsala, Sweden
OB1000001703AA62 35% Wed, 17/5/17 11:29 AM Ekonomikum, 753 13 Uppsala, Sweden
OB1000001703AA63 16% Wed, 17/5/17 10:10 AM Ekonomikum, 753 13 Uppsala, Sweden
OB1000001703AA65 10% Mon, 22/5/17 06:03 AM Rackarbergsgatan 15, 752 35 Uppsala, Sweden
OB1000001703AA66 100% N/A Rackarbergsgatan 15, 752 35 Uppsala, Sweden
OB1000001703AA67 0% N/A Rackarbergsgatan 15, 752 35 Uppsala, Sweden
OB1000001703AA68 0% N/A
OB1000001703AA80 100% N/A
OB1000001703AA82 0% N/A Ekonomikum, 753 13 Uppsala, Sweden
OB1000001703AA86 40% Mon, 22/5/17 12:58 AM Kyrkogårdsgatan 12, 753 13 Uppsala, Sweden

UPPSALA UNIVERSITET

Overview | Data | Products | Users | Support

uueko
uueko@outlook.com

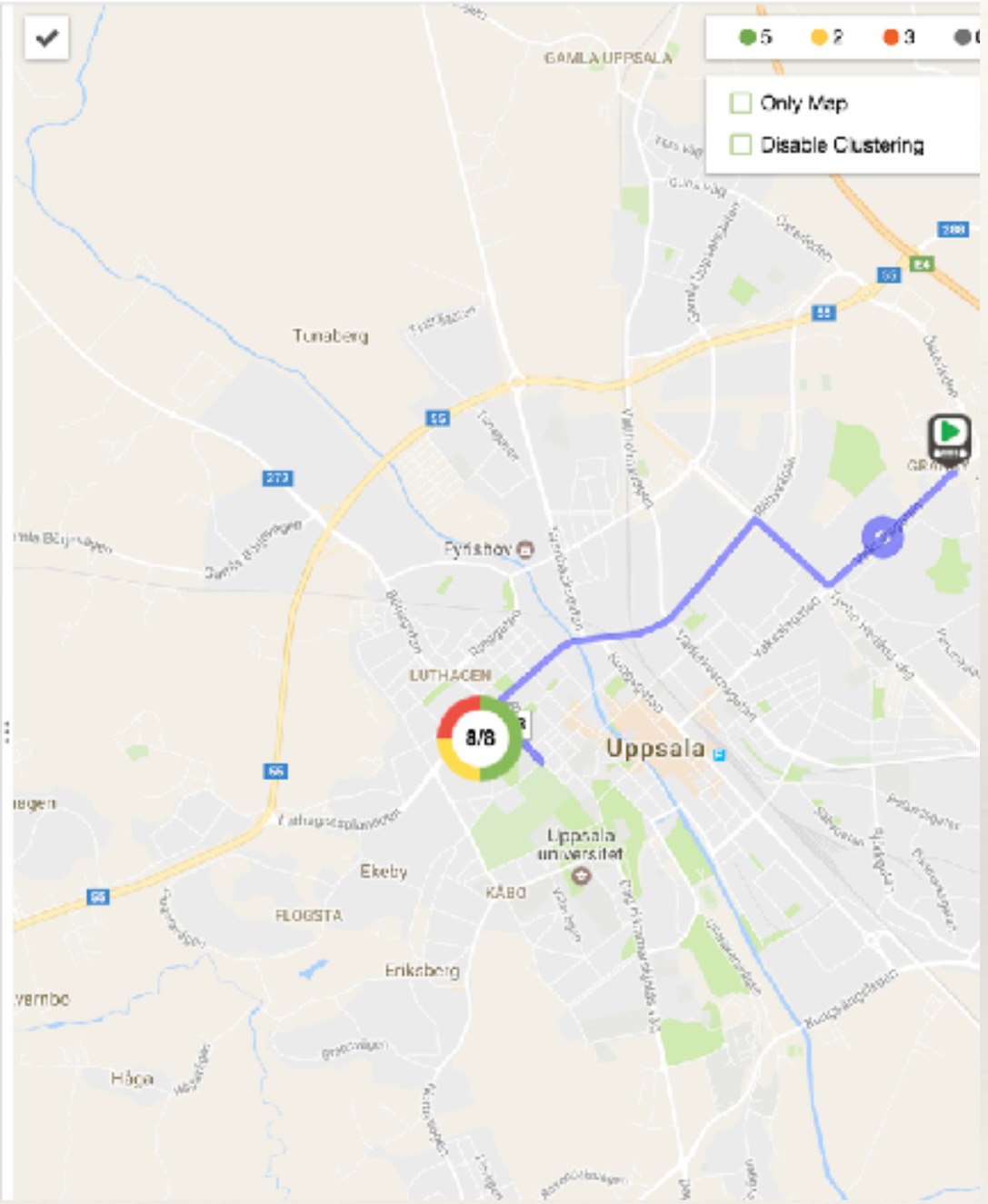
Overview

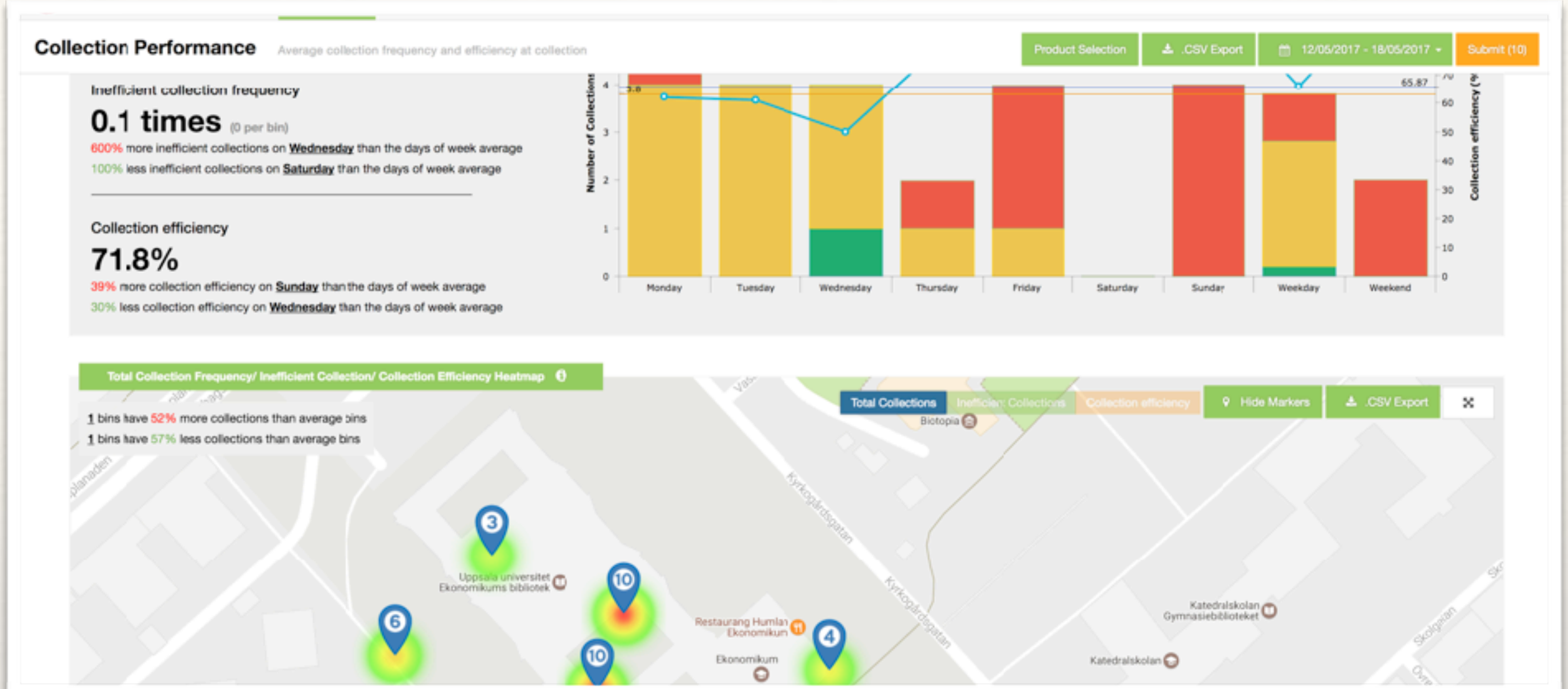
Real-time monitoring and route optimization

.CSV Export (8) | Set Start Point | Update Route (8) | Clear Route

Filtered Products (10) | Unfiltered Products (0)

	Description	Fill-level	Last Collection	Address
☑	OB100000170GAA81	100%	Sat, 20/5/17 05:16 PM	Ekonomikum, 753 13 Uppsala, Sweden
☑	OB100000170GAA82	35%	Wed, 17/5/17 11:29 AM	Ekonomikum, 753 13 Uppsala, Sweden
☑	OB100000170GAA83	16%	Wed, 17/5/17 10:10 AM	Ekonomikum, 753 13 Uppsala, Sweden
☑	OB100000170GAA85	10%	Mon, 22/5/17 06:03 AM	Rackarbergsgatan 15, 752 35 Uppsala, Sweden
☑	OB100000170GAA86	100%	N/A	Rackarbergsgatan 15, 752 35 Uppsala, Sweden
☑	OB100000170GAA87	0%	N/A	Rackarbergsgatan 15, 752 35 Uppsala, Sweden
☐	OB100000170GAA88	0%	N/A	
☐	OB100000170GAA80	100%	N/A	
☑	OB100000170GAA82	0%	N/A	Ekonomikum, 753 13 Uppsala, Sweden
☑	OB100000170GAA86	40%	Mon, 22/5/17 12:56 AM	Kyrkogårdsgatan 12, 753 13 Uppsala, Sweden



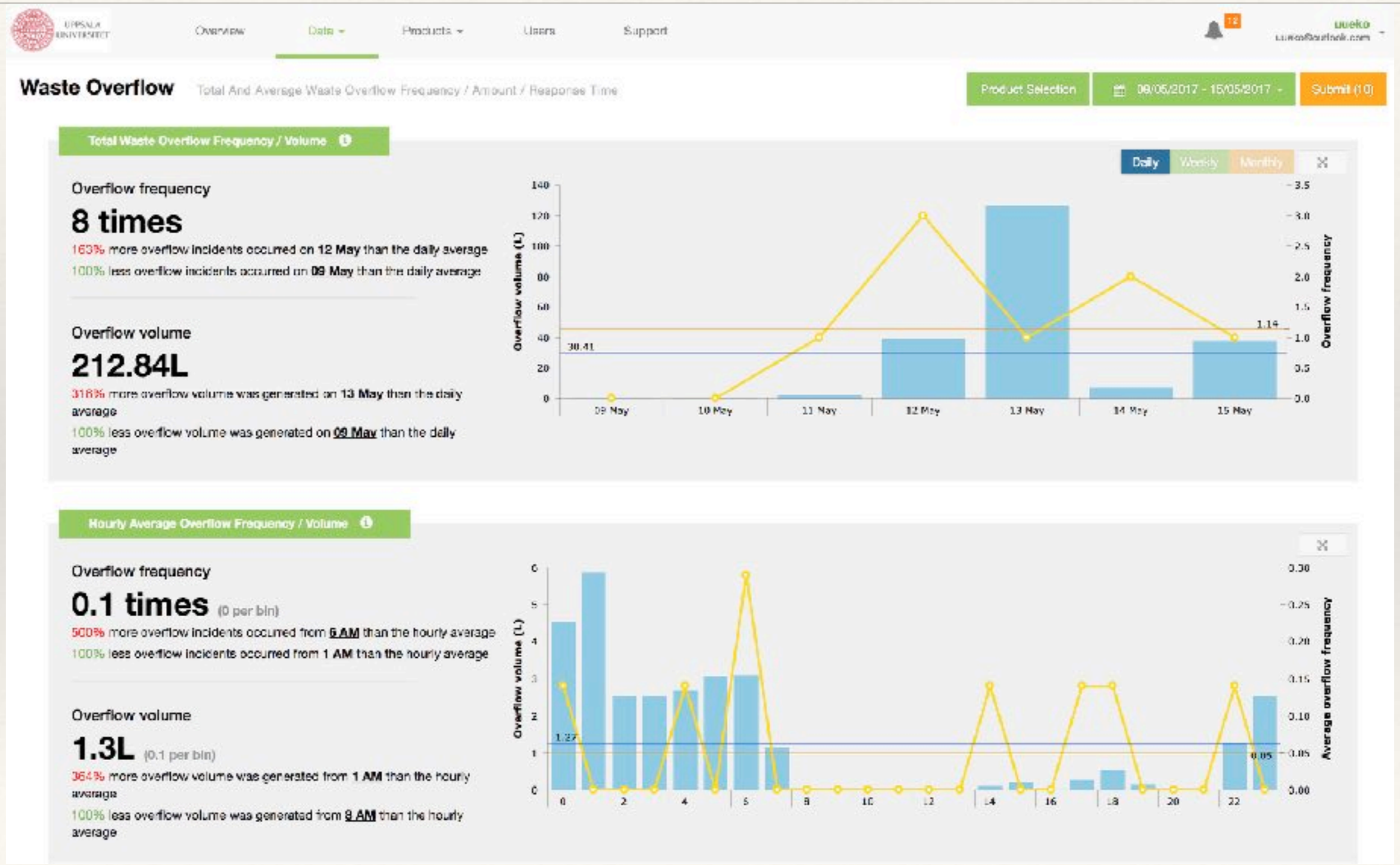


concentration mapping

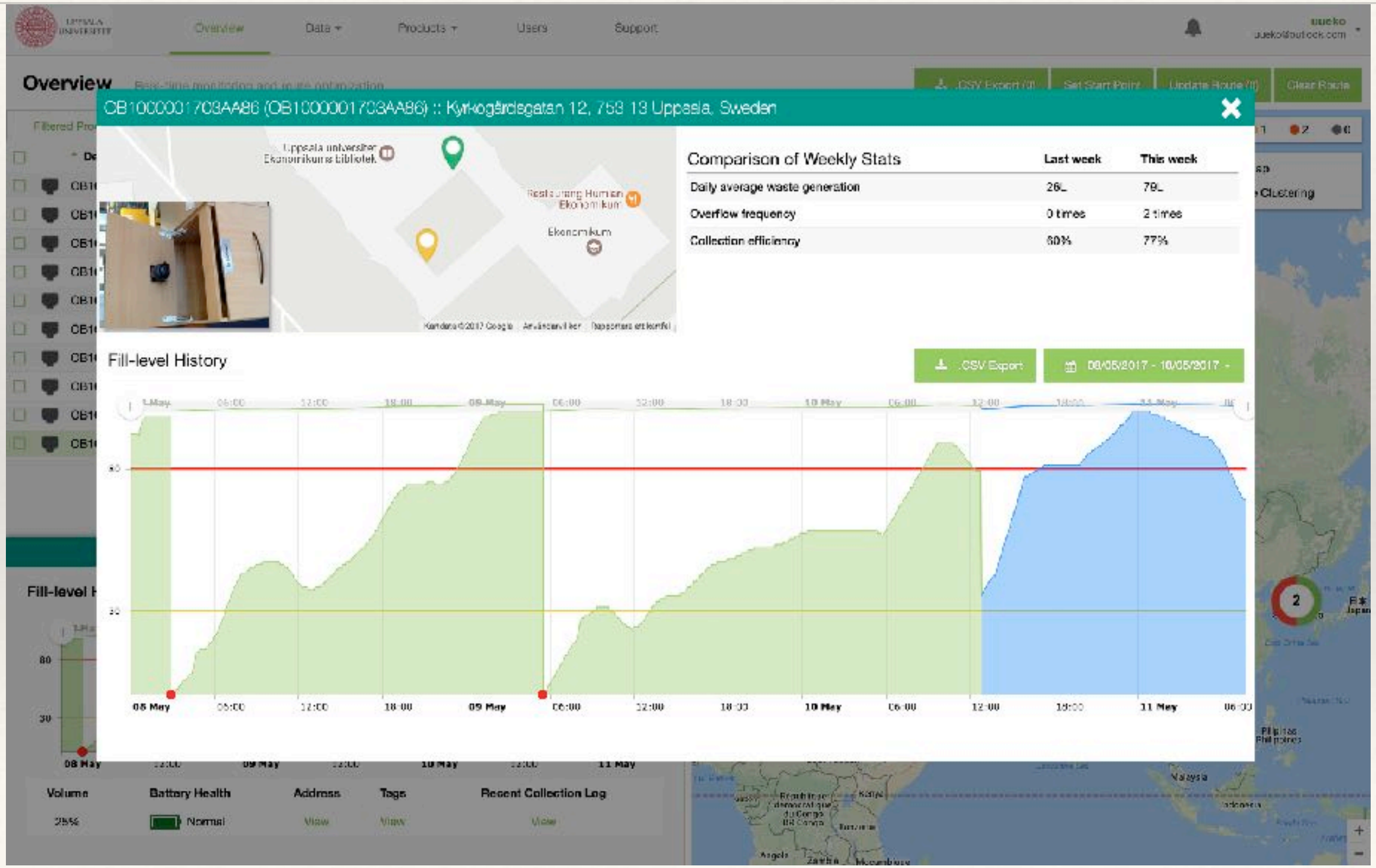
other factors

keep it as ‘research questions’

urban planning



relocation of resources



Acknowledge

ALMI INVEST

European Commission

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INNOVATION