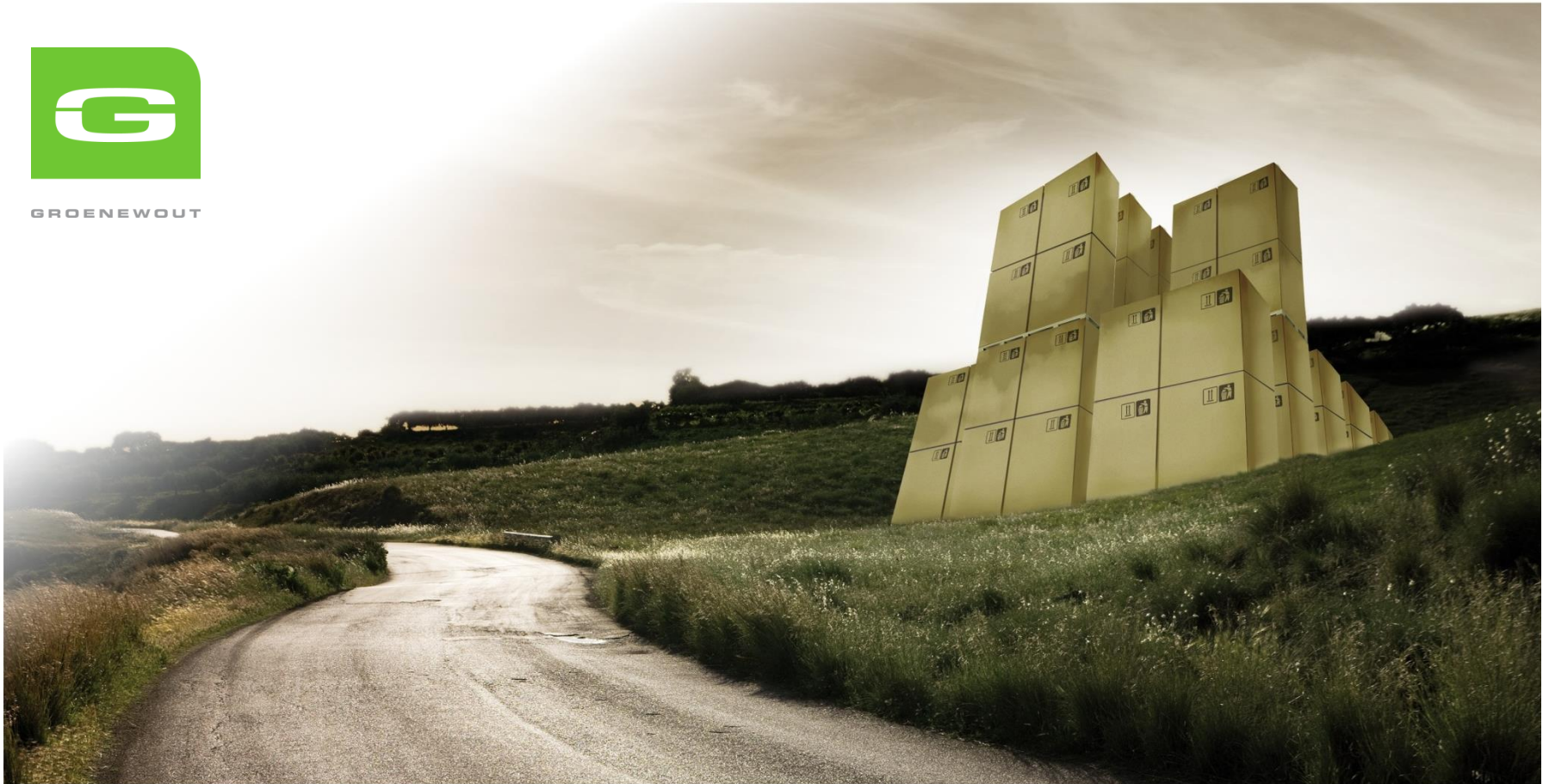


# Lower costs & improved services by assessing transportation routes periodically

Case



GROENEWOUT



March 27<sup>th</sup>, 2014

Supply Chain Innovations 2014, Antwerp

Presentation by Mohamed Lasgaa



GROENEWOUT

48 years of Top Consultancy

Logistics

Supply Chain Management

Supply Chain Strategy ► Implementation

Independent

Multidisciplinary Team

Leading Edge

# The Customer

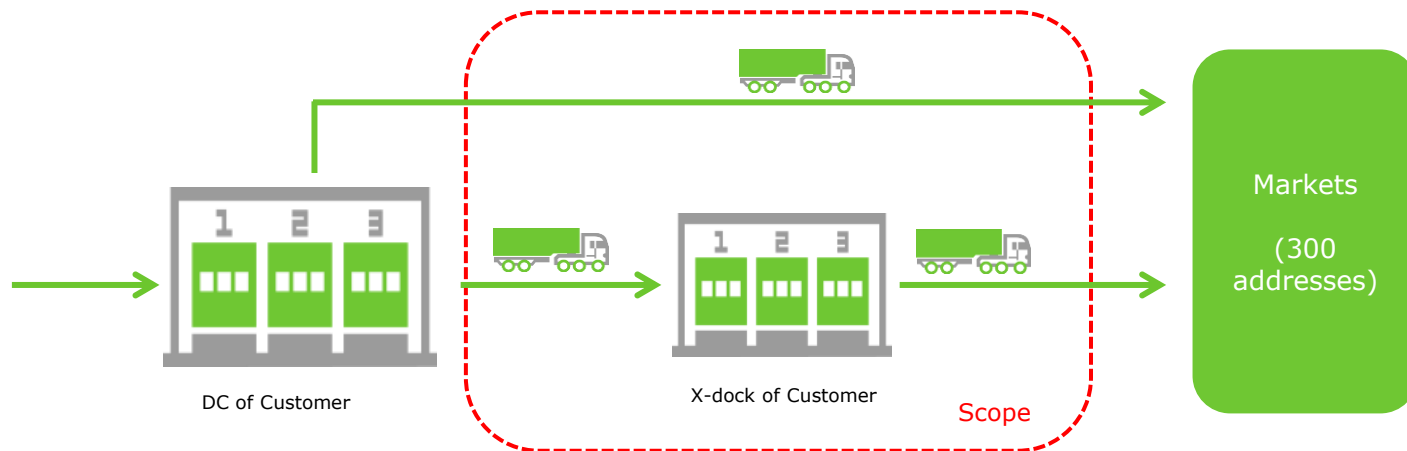
## CUSTOMER PROFILE

Activities	Manufacturing & distribution of building systems based on aluminum profiles for windows and (sliding) doors
Position	European Market Leader within the SBU
Markets	Offices - schools - hospitals - business parks – airports - shopping centers
Sales Area	Europe & Asia
Net Sales (FY 2012)	€ 300 Mio ( <i>€ 4,000 Mio on Group level</i> )
Employees (FY 2012)	1,200 ( <i>15,000 on Group level</i> )

# Voice of the Customer

For their customer base in Belgium (ca. 300 delivery addresses), they were supplying either directly from their Belgian DC either indirectly via a X-dock hub:

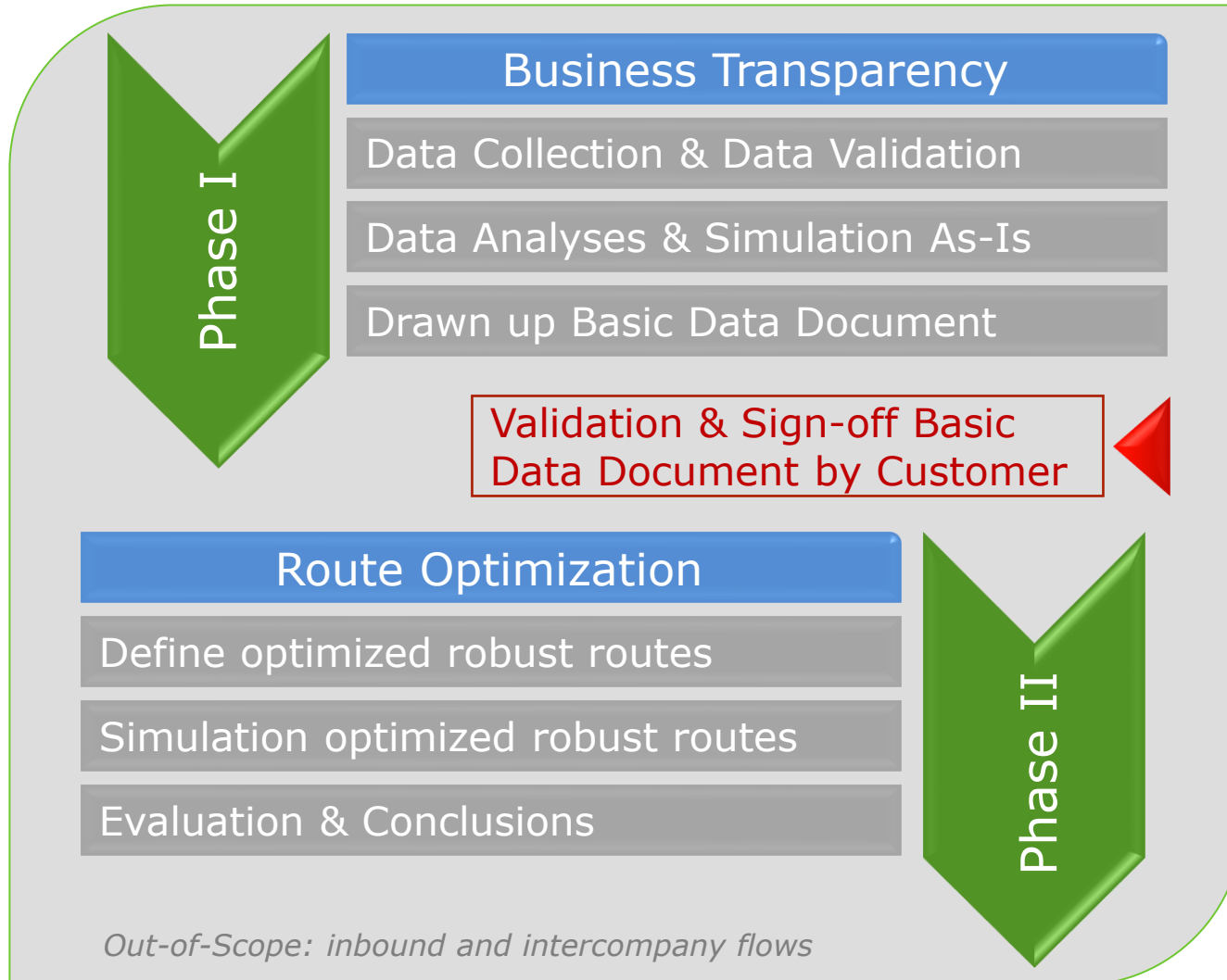
- 70% of shipments directly from DC to Customers via 25 fixed milk runs (by an outsourced transportation company).
- 30% of shipments via own X-Dock center (consolidation with other shipments)
- Delivery lead time when production order is finished: A for C



Voice of the  
Customer

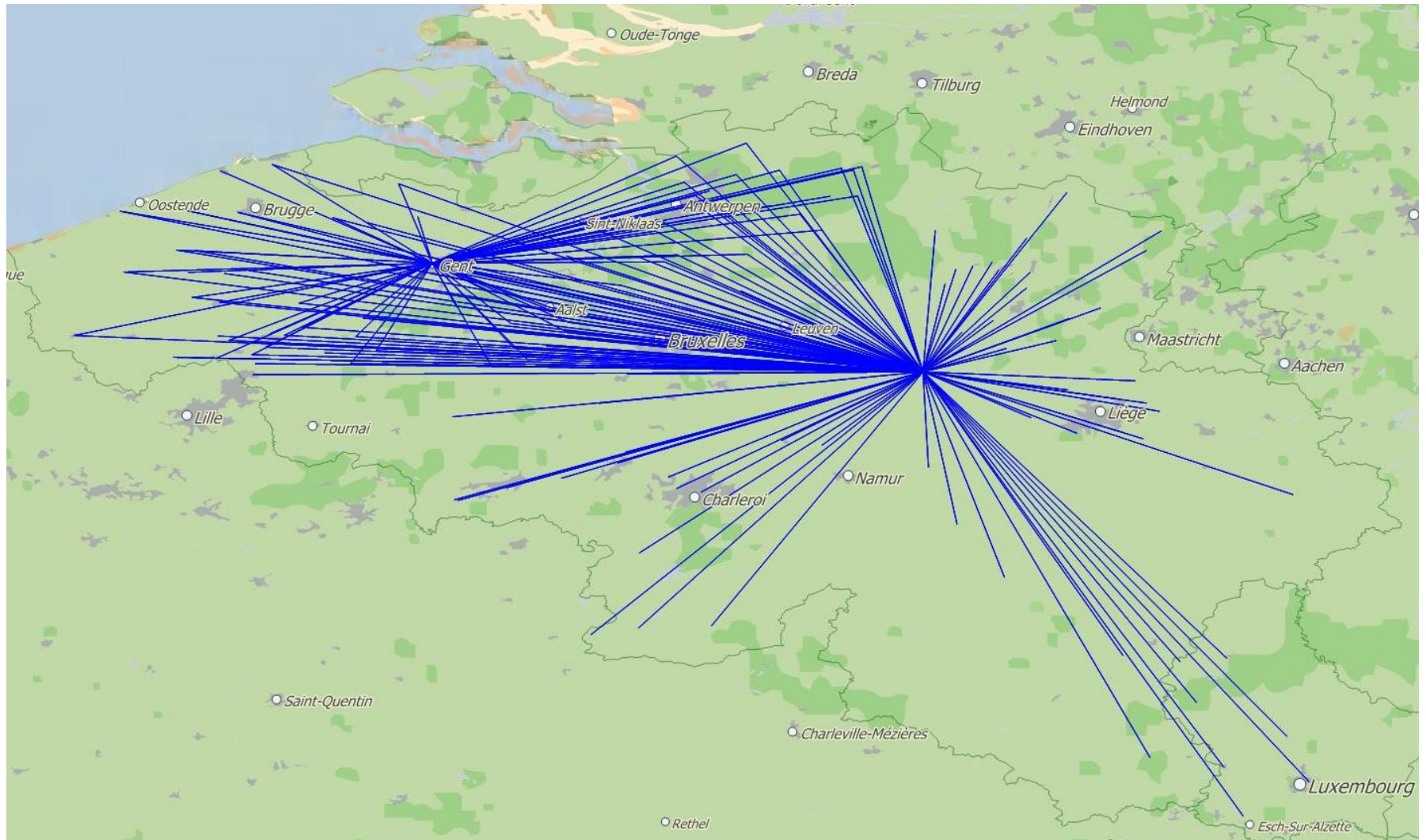
Is the current fixed routings setup still the most efficient one?

# Plan of Approach





# Belgian Distribution Network



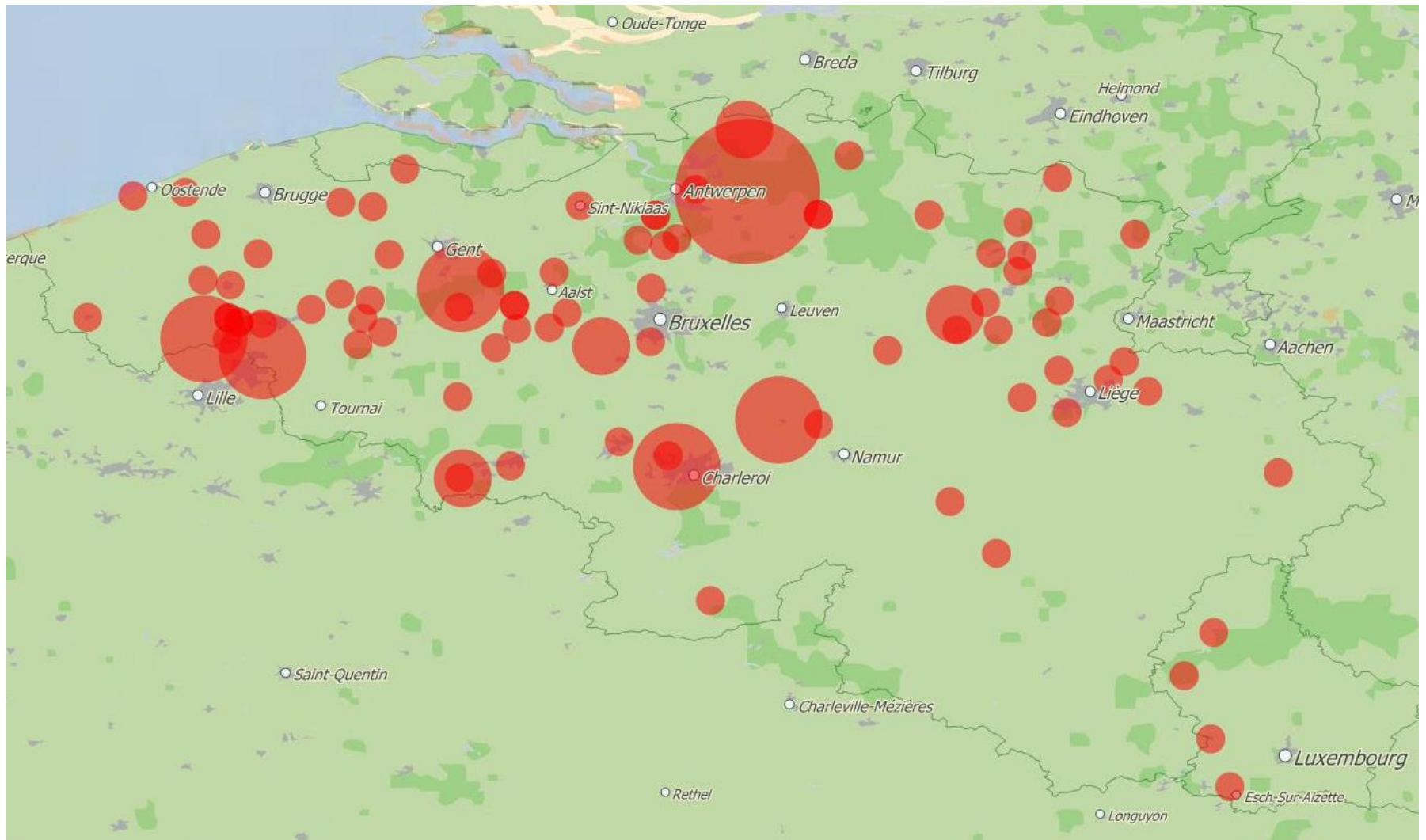
# Customer Places

RED = DELIVERED FROM DC | GREEN = DELIVERED FROM X-DOCK



# Density Plot of Customers

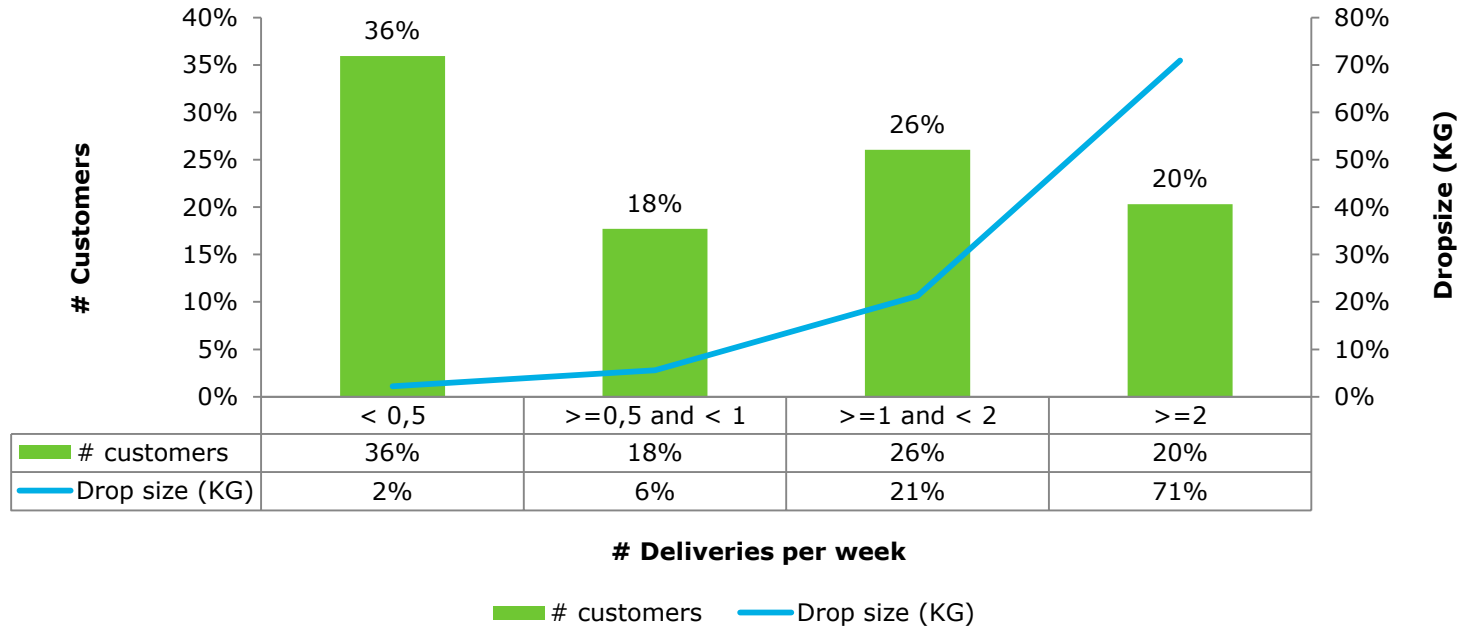
SIZE BASED ON GROSS WEIGHT DELIVERED





# Number of Deliveries per Customer

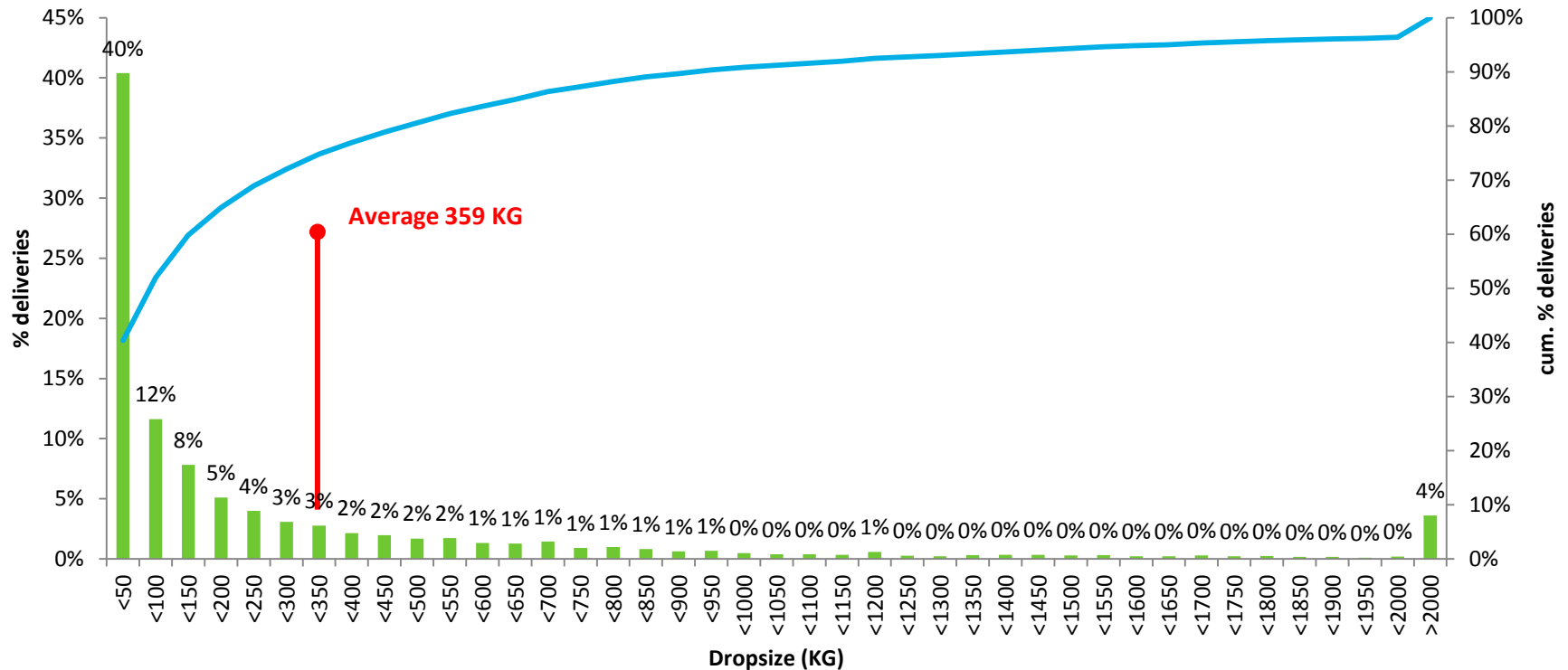
46% OF THE CUSTOMERS ARE DELIVERED AT LEAST ONCE A WEEK



- The majority of the customers (36%) are delivered less than once in two weeks;
- 18% customers are delivered bi-weekly and 26% customers are delivered weekly;
- 20% customers are delivered at least twice a week;
- The average drop size increases as the frequency of the deliveries increases.

# Distribution of drop size

40% OF THE DELIVERIES HAS A DROP SIZE LOWER THAN 50 KG



- The average drop size of the deliveries is 359 KG;
- About 40% of the shipments have a drop size below 50 KG.

# Simulation of As-Is

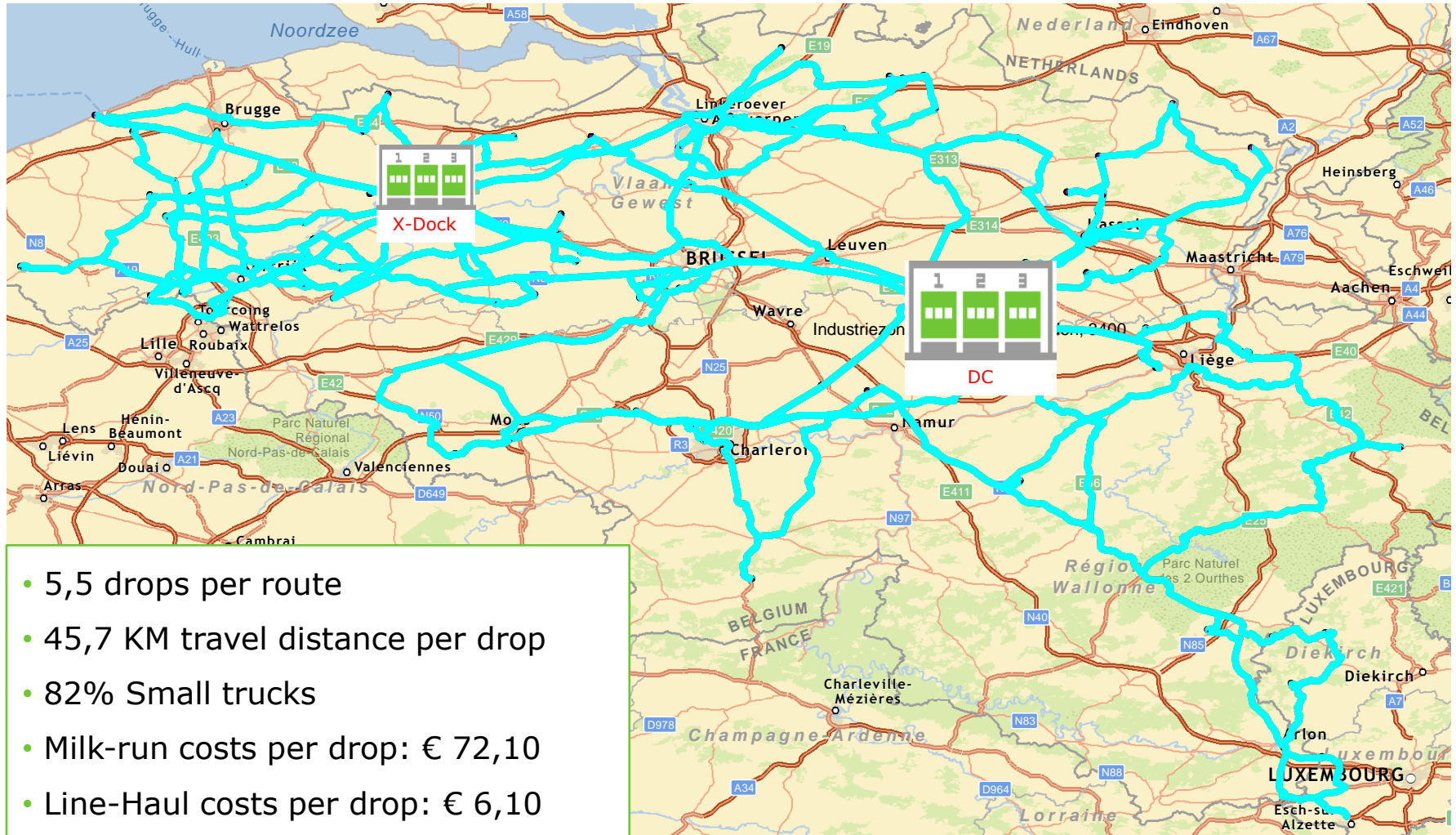
## OVERVIEW OF ASSUMPTIONS

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- Simulation is based on active customers only;
- Simulation is done for 3 representative weeks (low-average-peak);
- The customer delivery time window is from 7:30 till 16:30;
- The earliest dispatch time allowed is 6:00 AM;
- Maximum driving time is 10 hours;
- Customer is delivered on a same day;
- 2 type of vehicles are available:
  - A small truck with a capacity of 4.500KG;
  - A large truck with a capacity of 10.000KG;
- Historic traffic information is used.

# Simulation of As-Is

AVERAGE COST PER DROP IS € 78,20

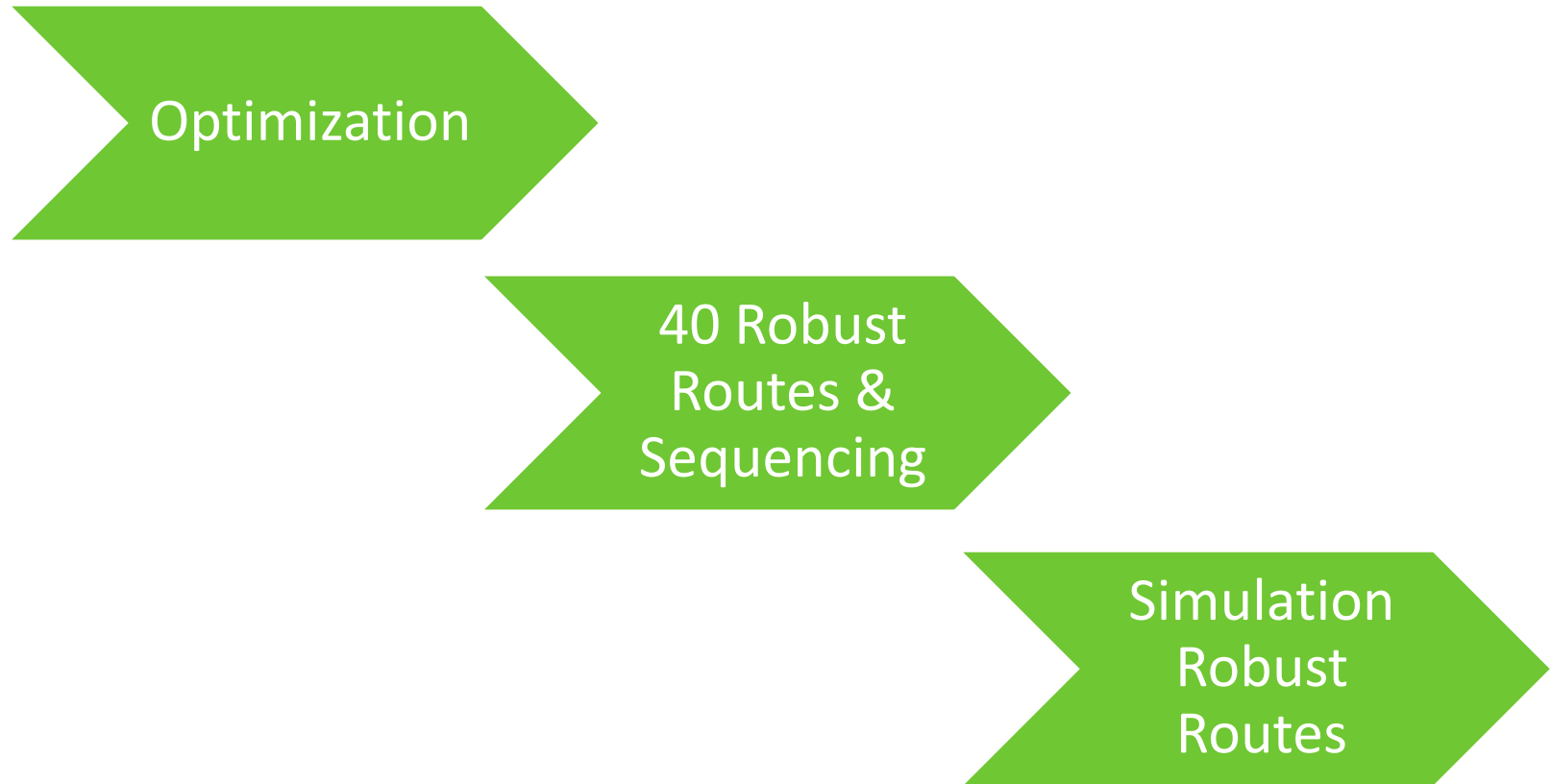




# Methodology to develop robust routes

FIRST OPTIMIZATION (ALL ACTIVE CUSTOMERS) THEN SIMULATION REPRESENTATIVE WEEKS

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# Robust Routes Optimization & Simulation from DC

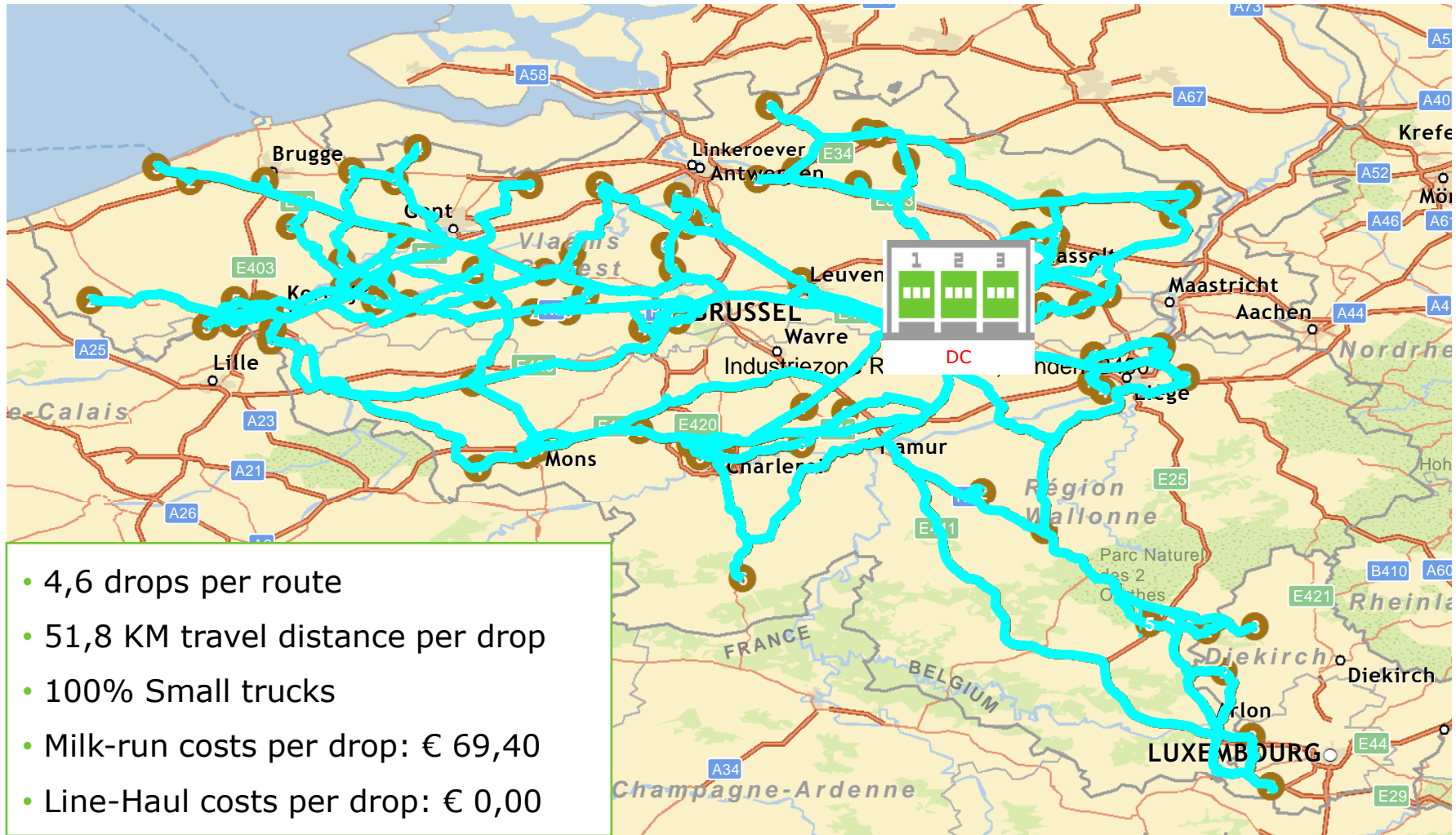
## OVERVIEW OF ASSUMPTIONS

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- Optimization & simulation is based on active customers only;
- Simulation is done for 3 representative weeks (low-average-peak);
- 5% of truck capacity and 14% of time is reserved for non-active customers;
- All shipments are shipped from DC (no volumes through X-dock);
- The customer delivery time window is from 7:30 till 16:30;
- The earliest dispatch time allowed is 6:00 AM;
- Maximum driving time is 10 hours;
- Customer is delivered 1 or 2 times according to the service level;
- 2 type of vehicles are available:
  - A small truck with a capacity of 4.500KG: € 0,84 cost per KM;
  - A large truck with a capacity of 10.000KG: € 1,16 cost per KM;
- Cost per drop: € 25;
- Historic traffic information is used.

# Robust Routes Optimization & Simulation from DC

AVERAGE TRANSPORT COSTS OF € 69,40 PER DELIVERY (INCL. LINE-HAUL)



# As-Is vs. New Optimized Robust Routes

DECREASE IN DROPS (-0,9 DROPS) PER ROUTE AND INCREASE IN DISTANCE PER DROP (6.2KM)

Simulation	Scenario	# Drops	Routes	#Drops/Route	Distance (KM)	Distance per drop (KM)
Low week	As-Is	154	32	4.8	8,108	52.6
	New Robust Routes	121	23	5.3	5,442	45.0
Delta		-33	-9	0.4	-2,666	-7.7
Average week	As-Is	193	35	5.5	8,812	45.7
	New Robust Routes	148	32	4.6	7,668	51.8
Delta		-45	-3	-0.9	-1,144	6.2
High week	As-Is	199	38	5.2	10,562	53.1
	New Robust Routes	149	31	4.8	7,442	49.9
Delta		-50	-7	-0.4	-3,120	-3.1

- The As-Is routes: the actual amount of drops are simulated;
- The New Robust routes: the number of drops are simulated according to the service levels.



# Final Results

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- Applying new robust routes result in a transport cost savings of 11% p.a.;
- 40 new optimal robust routes are defined to serve both active/non-active customers;
- Small trucks only should be sufficient;
- On top:
  - Lead time reduction;
  - Risk mitigation on damages because of no re-handling at X-dock;
  - Increasing space capacity at X-dock because of eliminating X-dock volumes;
  - Eliminating handling costs at X-dock.
- Recommendations:
  - Perform a daily route optimization by re-routing the routes that have a low number of drops;
  - Static route planning is the best alternative for time being. Dynamic route planning is estimated to achieve additional savings potential of ca. 3% p.a.

THANK YOU  
VERY MUCH  
FOR YOUR  
ATTENTION



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