

April 9th, 2025

To Drive or to Bike?

Weighing costs, global warming
potential, and air quality

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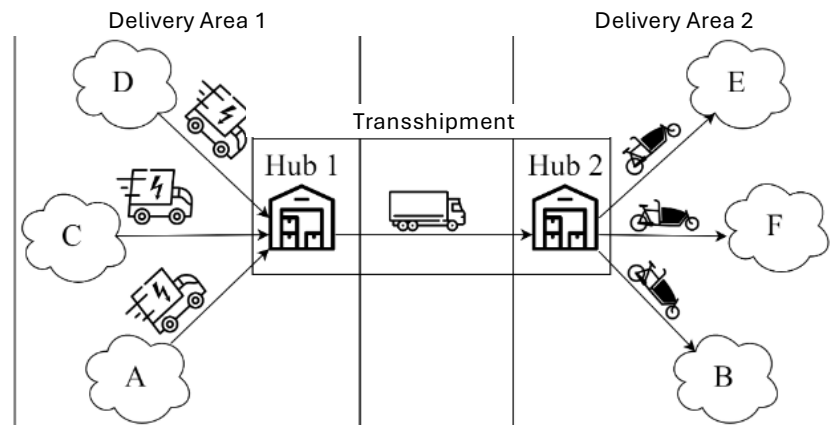
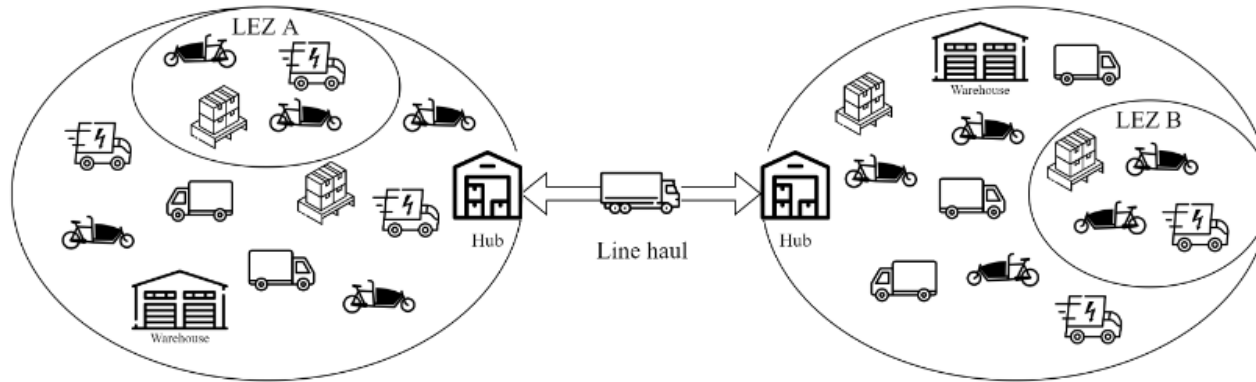


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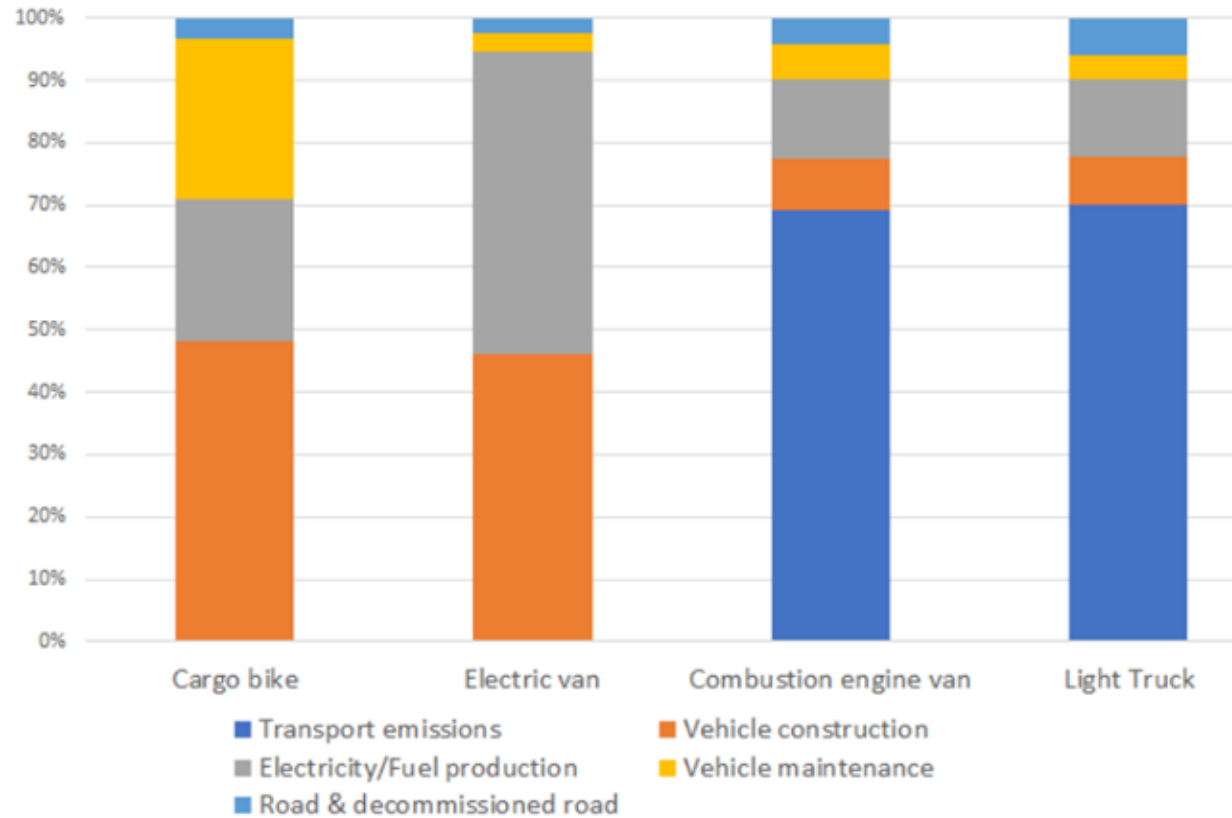
1. Problem description
2. Life Cycle Analysis
3. Total Cost of Ownership (TCO)
4. Decision Tool
5. Conclusion



PROBLEM DESCRIPTION



LIFE CYCLE ANALYSIS



Life-cycle CO₂eq emissions for different vehicles (in proportion).

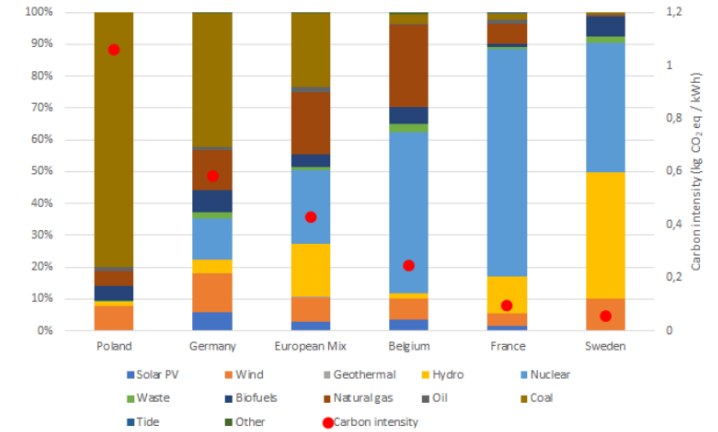
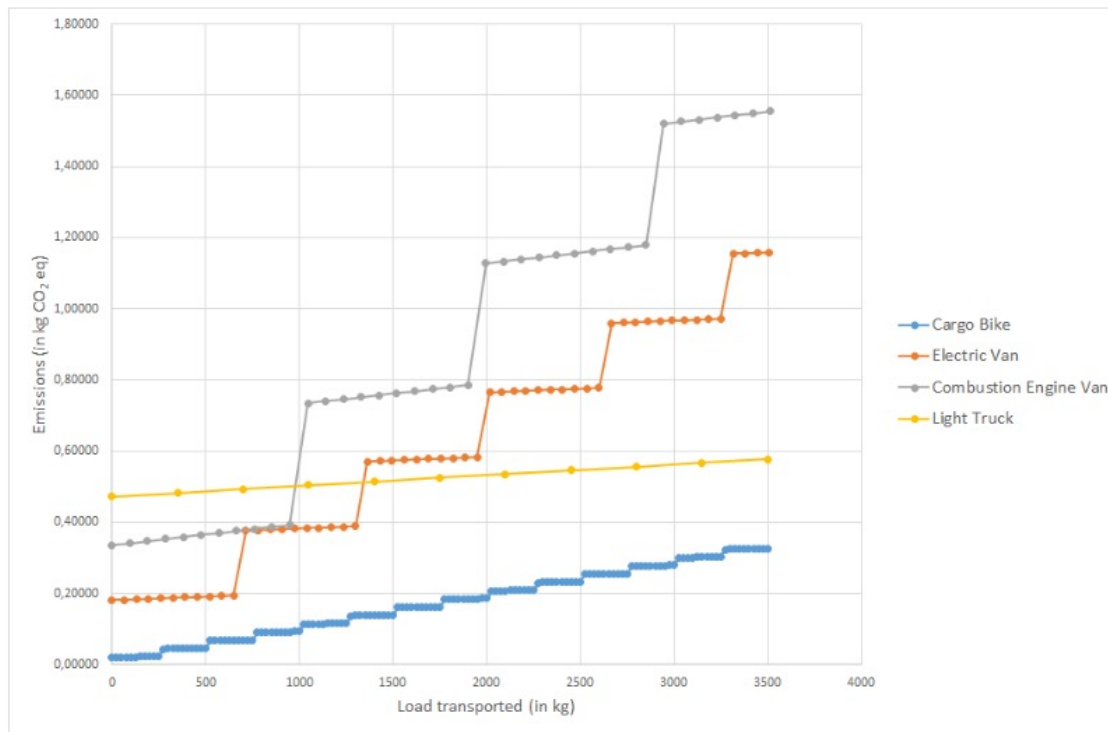


LIFE CYCLE ANALYSIS

	Maximum payload	LF (%)	kg CO ₂ eq	kg NO _x eq
Electric Cargo-Bike	250 kg	0%	0.0194	5.7 10 ⁻⁵
		100%	0.0210	5.9 10 ⁻⁵
Electric Van	650 kg	0%	0.1446	4.55 10 ⁻⁴
		100%	0.1517	4.64 10 ⁻⁴
Combustion Engine Van	950 kg	0%	0.3272	1.511 10 ⁻³
		100%	0.3812	1.770 10 ⁻³
Light truck	3.5 t	0%	0.4656	6.66 10 ⁻⁴
		100%	0.5603	7.51 10 ⁻⁴
Medium truck	10 t	0%	0.6204	9.40 10 ⁻⁴
		100%	0.8231	1.135 10 ⁻³
Large truck	22 t	0%	0.8030	1.289 10 ⁻³
		100%	1.2442	1.724 10 ⁻³



LIFE CYCLE ANALYSIS



Article

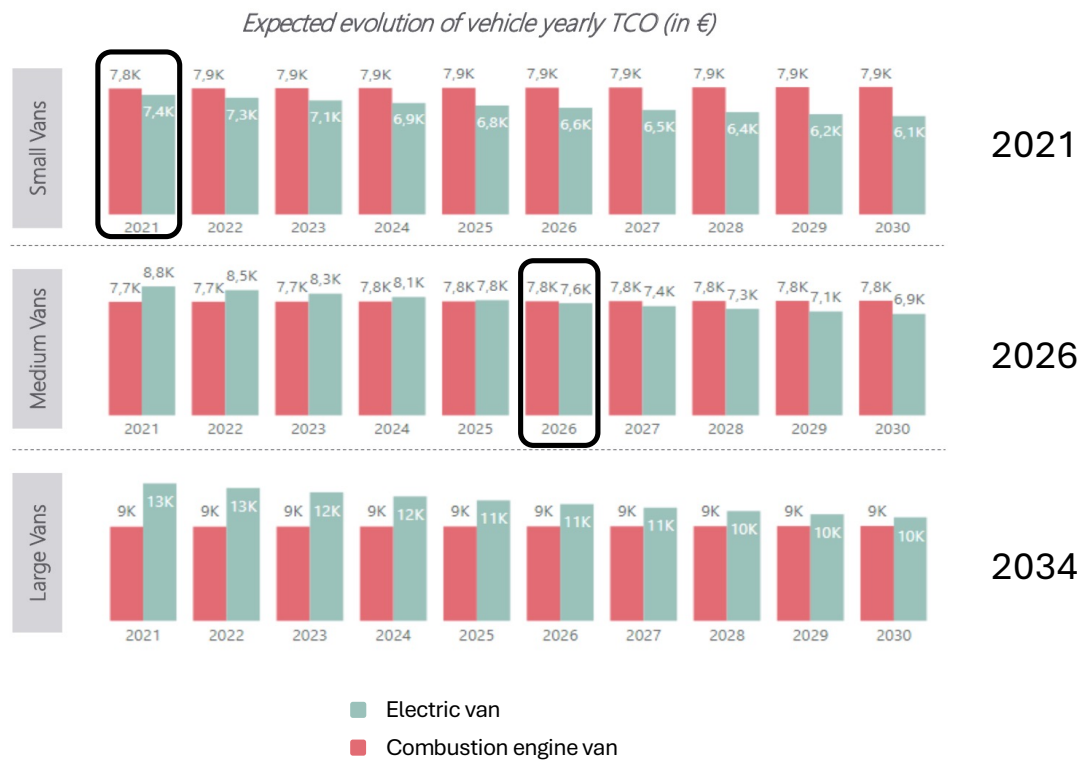
Cost and Environmental Impacts of a Mixed Fleet of Vehicles

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TOTAL COST OF OWNERSHIP (TCO)



Source : Roadmap towards CO₂ neutral last mile delivery

TOTAL COST OF OWNERSHIP (TCO)

Electric Vehicles



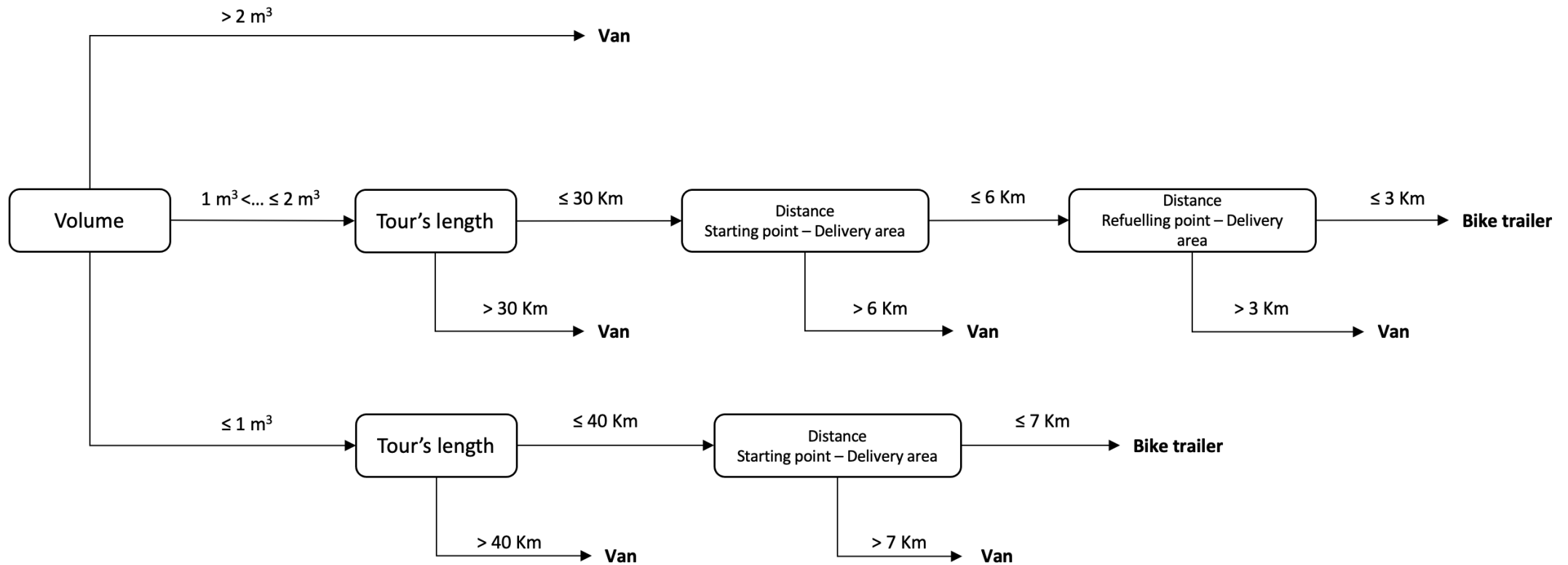
	Small	Medium	Large
TCO	7 608,41 €	8 917,71 €	13 475,82 €
Infrastructures	371,09 €	371,09 €	371,09 €
Total (€/year)	7 979,51 €	9 288,81 €	13 846,92 €

eBikes + Trailers

	eBikes + Trailers
TCO	3 825,06 €
Infrastructures	322,32 €
Total (€/year)	4 147,38 €



DECISION TOOL (COST-ORIENTED)



FUTURE

- DECISION MODEL SUSTAINABILITY-ORIENTED
- MODEL COMPLEXITY (LEGAL CONSTRAINTS, TIME-WINDOW, ETC.)
- COLLECTION OF NON-CONFIDENTIAL DATA



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THANK YOU

QUESTIONS / DISCUSSIONS



UN 2025

Reimagining the Future of
Urban Freight

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