

LA LIVRAISON DE MARCHANDISES À VÉLO

UNE COMPARAISON DES IMPACTS ÉCOLOGIQUES DU LAST MILE À VÉLO ET EN CAMIONNETTE

Prof. Dr. Philippe Lebeau (philippe.lebeau@vub.be)

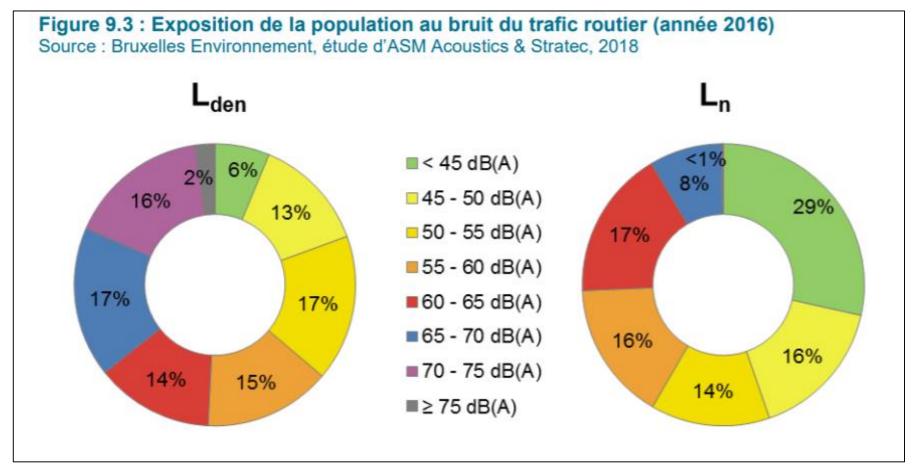


Air quality and climate change

Vans & trucks in Brussels are responsible of

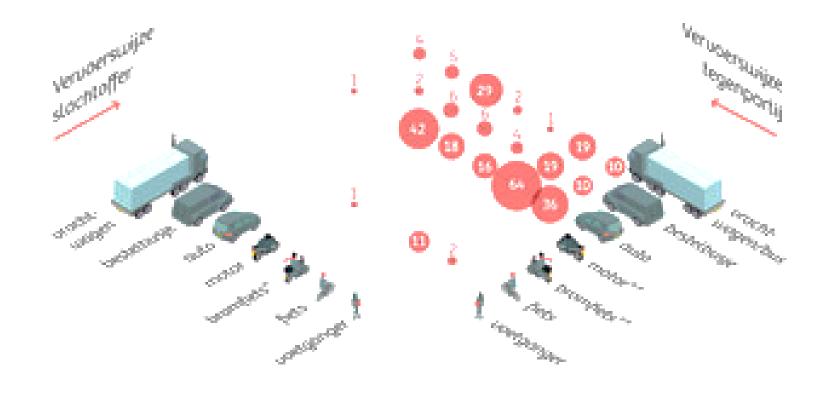
25% of CO₂ emissions 30% of NOx emissions 30% of PM emissions

Exposition au bruit du trafic routier





Accidents



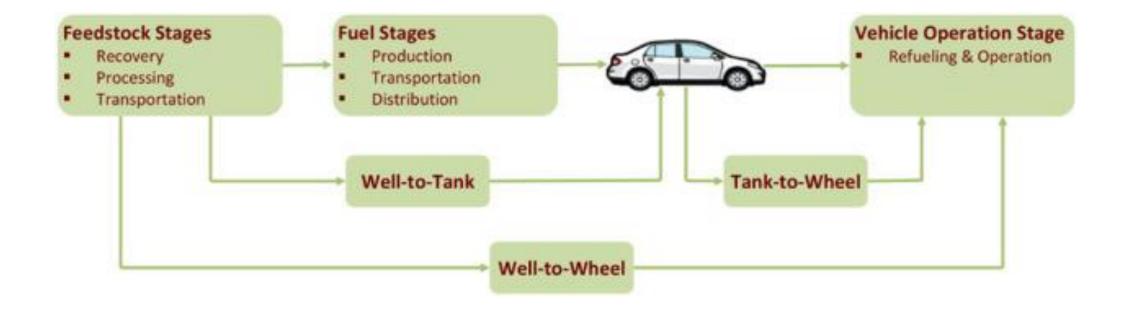
Janes Sancia

" incl. snorfletsers -- "" gegevens motor/bromflets als tegenpartij niet beschikbaar





Well-To-Tank





Research question

To what extent may electric cargo bicycles improve the environmental performance of city logistics?



Methodology

Four case studies









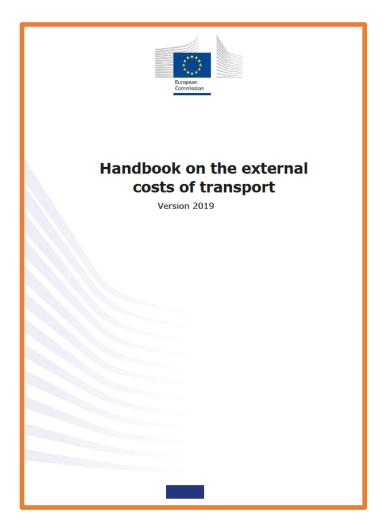








VAN ESSEN ET.AL. (2019)







LITMAN & DOHERTY (2016)



Telephone: 250-360-1560 | email: Info@vtpi.org

Transportation Cost and Benefit Analysis

Techniques, Estimates and Implications

Second Edition 2 January 2009

By Todd Alexander Litman Victoria Transport Policy Institute

With Eric Doherty

Abstract

This 500+ page document is a comprehensive study of transportation benefit and costing, and a guidebook for applying this information. It includes detailed analysis of various transport costs and benefits. These impacts are described in detail and categorized by various attributes: whether they are internal or external, fixed or variable, market or nonmarket. Using the best available data, it provides monetized estimates of twenty three costs for eleven travel model or under three travel conditions.

This document is unique in several important ways. It is one of the most comprehensive studies of its kind, including many often-overlooked impacts. It is the only transport cost study regularly updated as new information becomes available. It explains economic concepts and evaluation techniques. It provides costs values in a format designed to help users easily apply this information to policy analysis and planning situations. It includes a spreadsheet that automates cost analysis. It discusses the implications and applications of analysis results. It provides extensive references, many available through the Internet, so users can obtain more detailed information as needed.

This study indicates that on average about a third of automobile costs are external and about a quarter are internal but fixed. Fuel efficient and alternative their elvehicles tend to have somewhat lower external costs. Transit tends to have lower total costs under urban-peak conditions. Ridesharfing tends to have the lowest marginal costs. Motorcycles tend to have relatively high costs due to their high crash risk. Normotorized modes (walking and cycling) have minimal external costs. This study describes various policy and planning reforms that can help increase economic efficiency and equity.

Todd Litman © 1995-2009

You are welcome and encouraged to copy, distribute, share and excerpt this document and its ideas, provided the author is given attribution. Please send your corrections, comments and suggestions for improving it.

VAN ESSEN ET.AL. (2019)

LITMAN & DOHERTY (2016)



Handbook on the external costs of transport

Version 2019

- 1) ACCIDENT COSTS
- 2) AIR POLLUTION COSTS
- 3) CLIMATE CHANGE COSTS



- 5) CONGESTION
- 6) WELL-TO-TANK EMISSIONS



Telephone: 250-360-1560 | email: Info@vtoi.org

Transportation Cost and Benefit Analysis

Techniques, Estimates and Implications

Second Edition 2 January 2009

By Todd Alexander Litman Victoria Transport Policy Institute

With Eric Doherty

Abstract

This 500+ page document is a comprehensive study of transportation benefit and costing, and a guidebook for applying this information. It includes detailed analysis of various transport costs and benefits. These impacts are described in detail and categorized by various attributes: whether they are internal or external, fixed or variable market or nonmarket. Using the best available data, it provides monetized estimates of twenty three costs for eleven travel models under three travel conditions.

This document is unique in several important ways. It is one of the most comprehensive studies of its kind, including many often-overlooked impacts. It is the only transport cost study regularly updated as new information becomes available. It explains economic concepts and evaluation techniques. It provides costs values in a format designed to help users easily apply this information to policy analysis and planning situations. It includes a spreadsheet that automates cost analysis. It discusses the implications and applications of analysis results. It provides extensive references, many available through the Internet, so users can obtain more detailed information as needed.

This study indicates that on average about a third of automobile costs are external and about a quarter are internal but fixed. Fuel efficient and alternative fuel vehicles tend to have somewhat lower external costs. Transit tends to have lower total costs under urban-peak conditions. Ridesharing lends to have the lowest marginal costs. Motorcycles tend to have relatively high costs due to their high crash risk. Nonmotorized modes (walking and cycling) have minimal external costs. This study describes various policy and planning reforms that can help increase economic efficiency and equify.

Todd Litman © 1995-2009

You are welcome and encouraged to copy, distribute, share and except this document and its ideas, provided the author is given attribution. Please send your corrections, comments and suggestions for improving it.





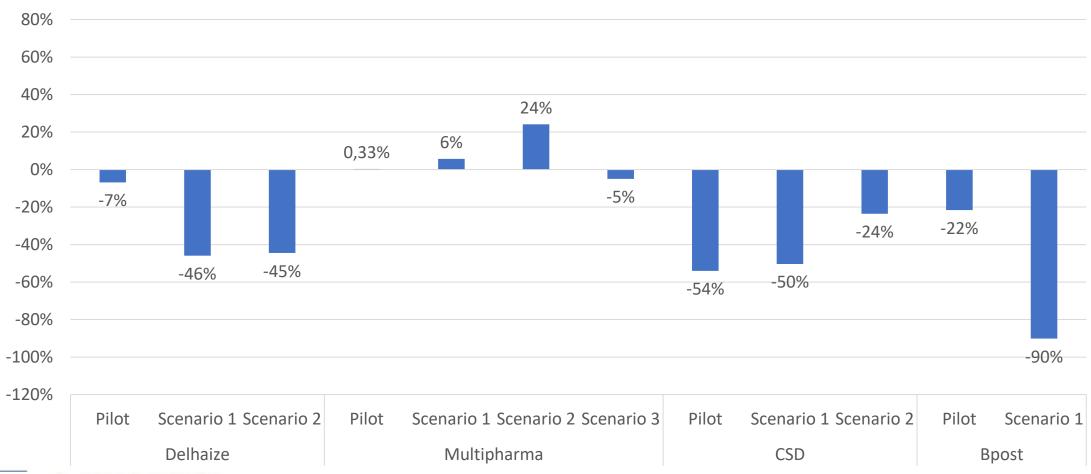
External costs per vehicle (€urocents/vkm)

Type of vehicle	Climate change costs	Air pollu- tion costs	Noise pollution costs	WTT costs	Accident costs	Conges- tion costs
LCV die- sel EUR 5	2.40	2.65	0.09	0.62	1.76	100.88
HGV 7.5- 12t EUR 6	5.43	1.48	0.5	1.26	1.82	134.5
Cargo Bike	0.00	0.00	0.00	0.16	0.42	1.39 18.06



Results

Total costs/savings

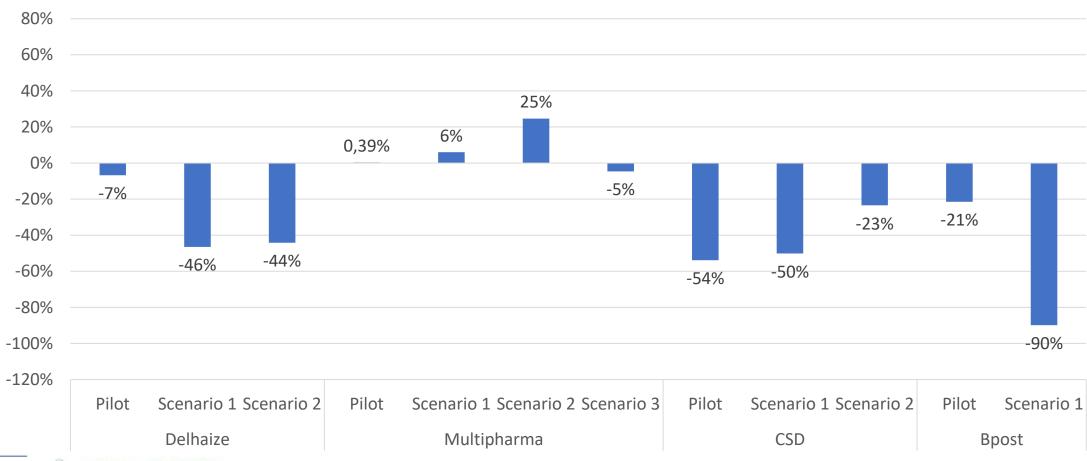








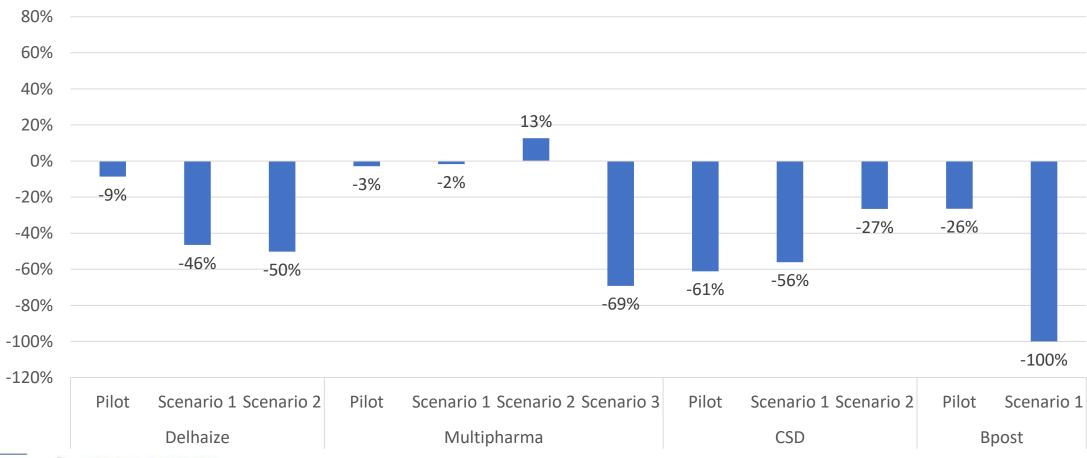
Costs/savings of congestion







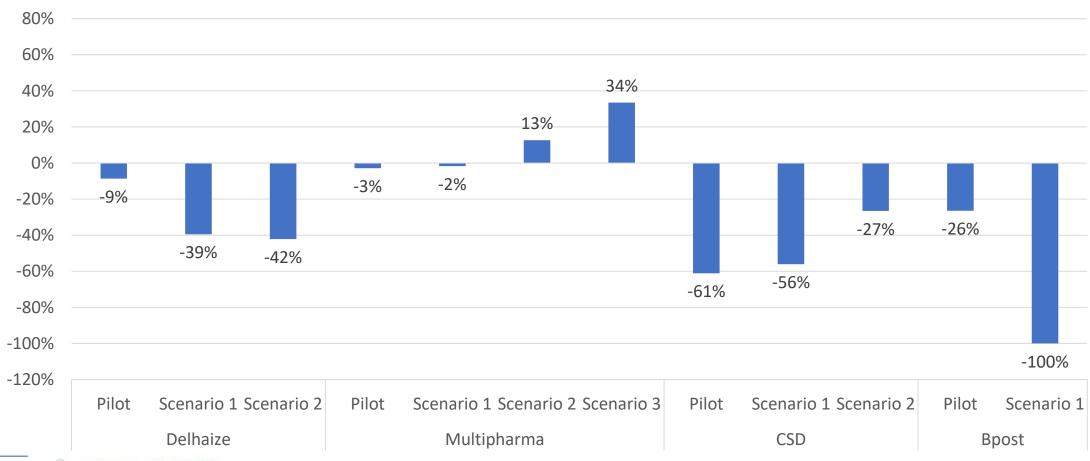
Costs/savings of air pollution







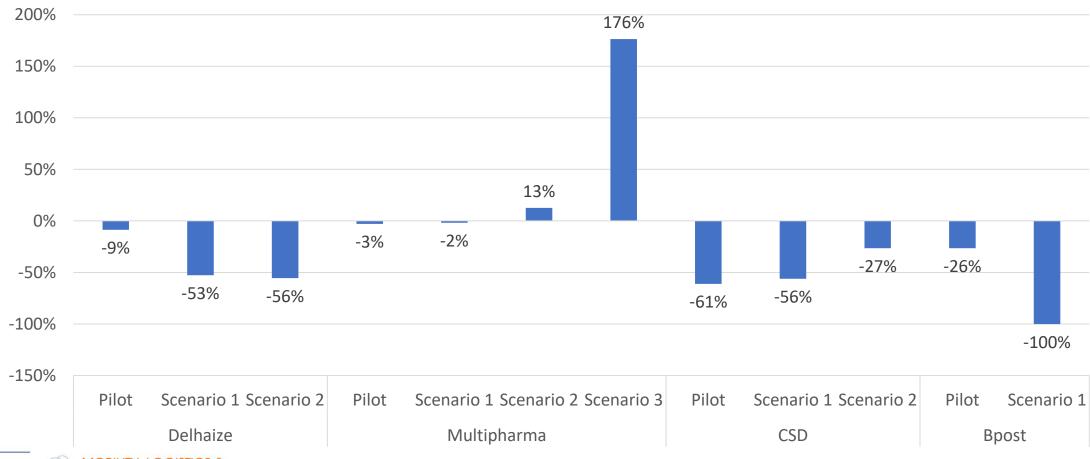
Cost/savings of climate change







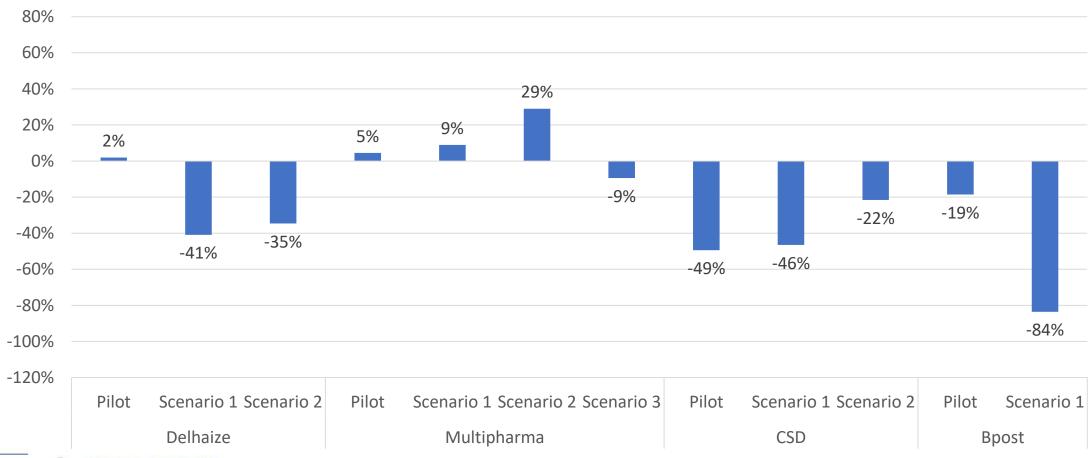
Costs/savings of noise pollution







Costs/savings of accidents

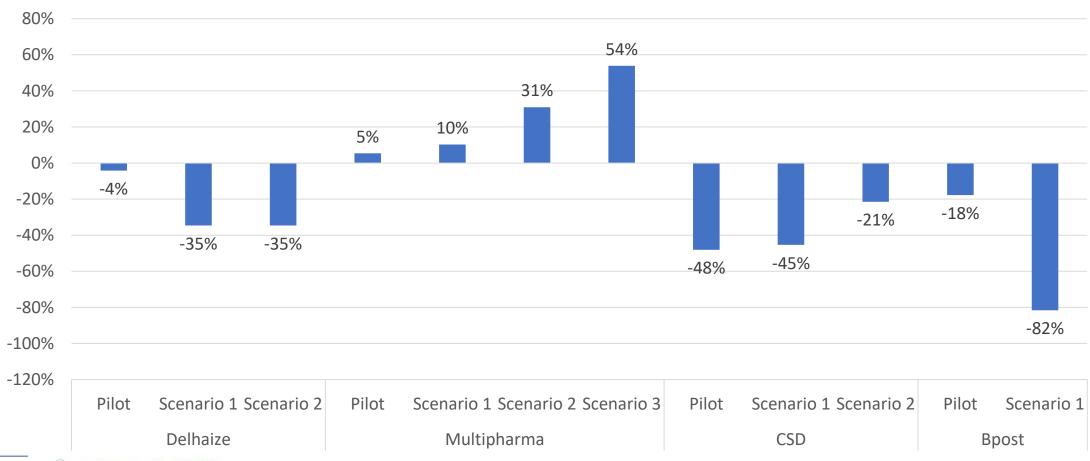






MOBILITY, LOGISTICS & AUTOMOTIVE TECHNOLOGY RESEARCH CENTRE

Costs/savings of WTT emissions





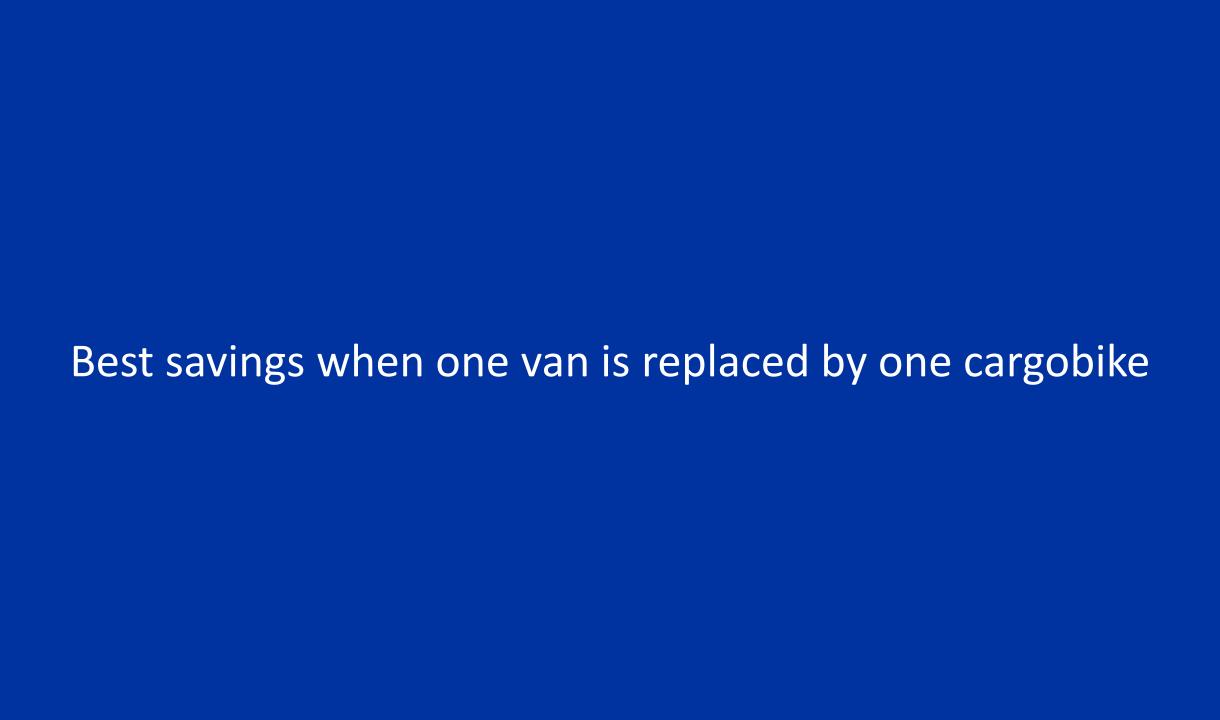




So what?

Conclusions

- 1. Best savings when one van is replaced by one cargobike
- 2. Large volumes are challenging due to congestion
- 3. Hubs support the sustainability of cargobikes
- 4. Focus should be on the line haul of hubs
- 5. The developement of cycling lanes reduce impact of cargobikes



CSD



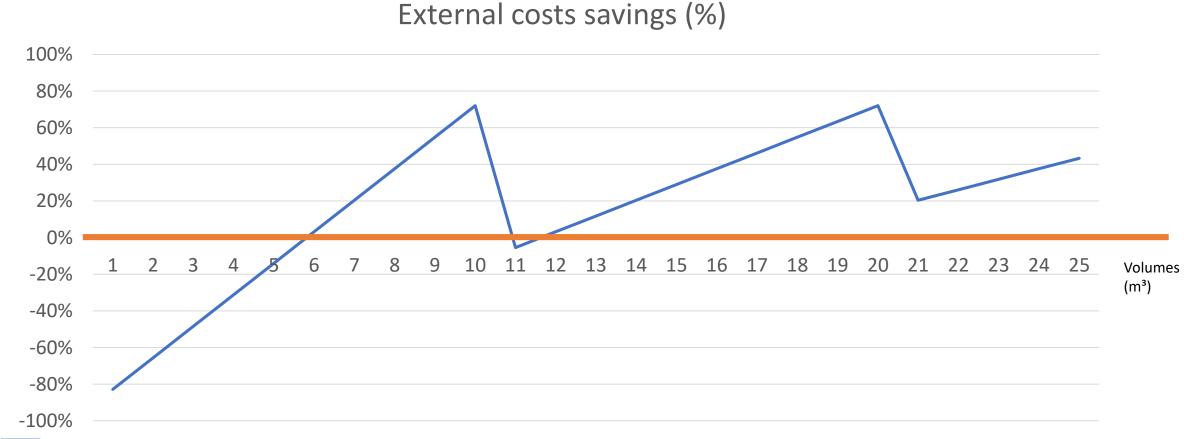


CSD

Case	KM by van/truck	KM by bicycle	Total
BAU	20.13	0	20.13
Pilot	7.83	9.95	17.78

Large volumes are challenging due to congestion

External cost sensitivity analysis







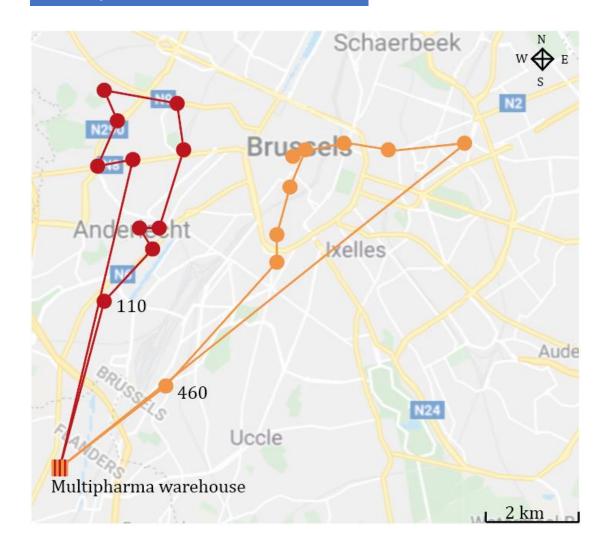
Hubs support the sustainability of cargobikes

Multipharma





Multipharma BAU/PILOT



Multipharma BAU/PILOT

Multipharma SCENARIO 1

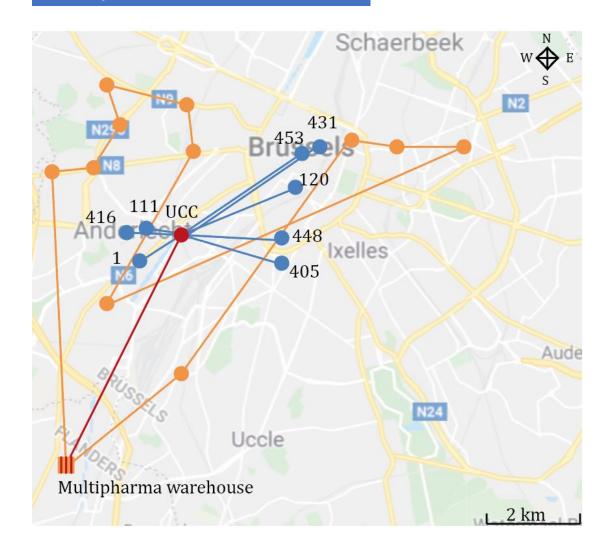






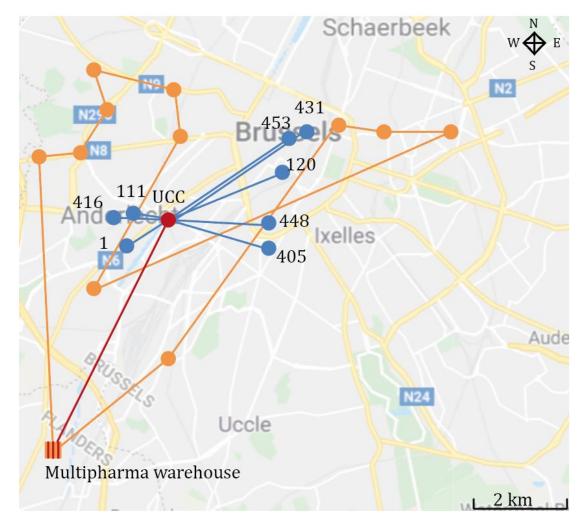


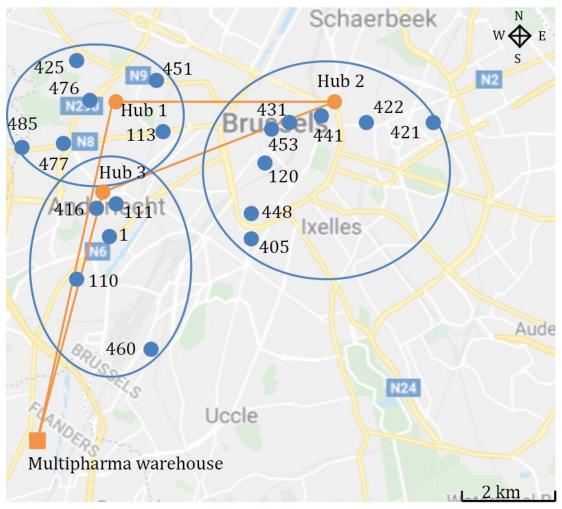
Multipharma SCENARIO 2



Multipharma SCENARIO 2

Multipharma SCENARIO 3







Multipharma

Case	KM by van/truck	KM by bicycle	Total
BAU	52.15	0	52.15
Pilot	50.65	16.33	66.98
Scenario 1 BAU	30.23	0	30.23
Scenario 1	29.71	13.7	43.41
Scenario 2 BAU	52.15	0	52.15
Scenario 2	58.78	35.98	94.76
Scenario 3 BAU	52.15	0	52.15
Scenario 3	30.76	65.95	96.71



Focus should be on the line haul of hubs

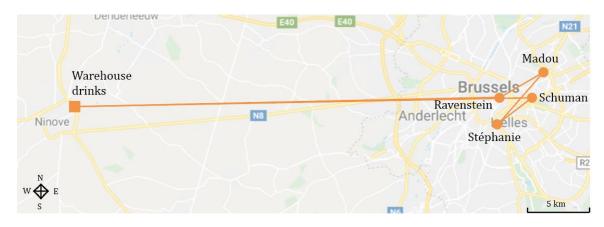
Delhaize



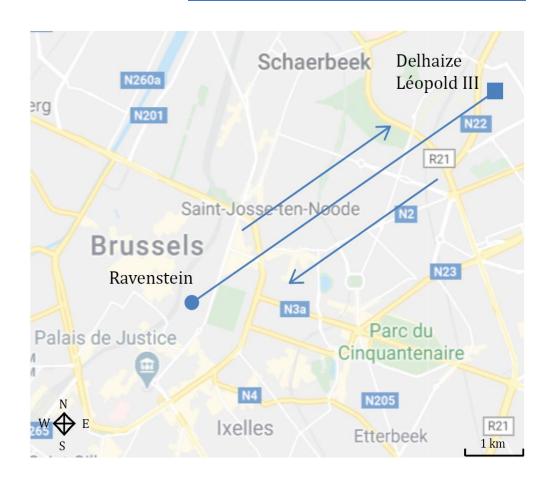


BAU

PILOT







SCENARIO 1 BAU





SCENARIO 1 BICYCLE

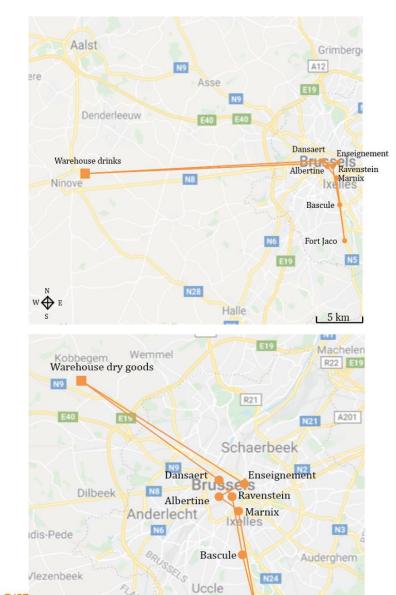






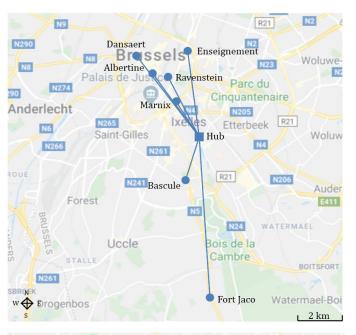


SCENARIO 2 BAU



Fort Jaco | Watermael-Boitsfor

SCENARIO 2 BICYCLE









MOBILITY, LOGIST AUTOMOTIVE TECH RESEARCH CENTR



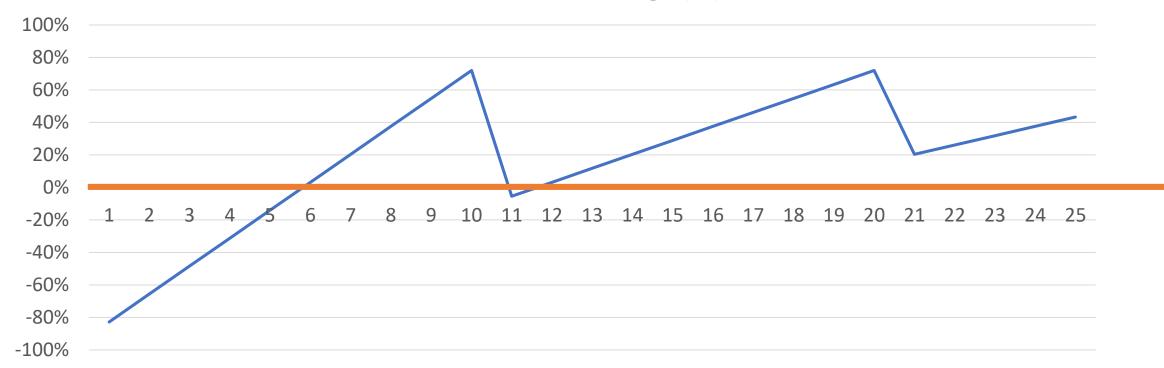
External costs per vehicle (€urocents/vkm)

Type of vehicle	Climate change costs	Air pollu- tion costs	Noise pollution costs	WTT costs	Accident costs	Conges- tion costs
LCV die- sel EUR 5	2.40	2.65	0.09	0.62	1.76	100.88
HGV 7.5- 12t EUR 6	5.43	1.48	0.5	1.26	1.82	134.5
Cargo Bike	0.00	0.00	0.00	0.16	0.42	1.39 18.06



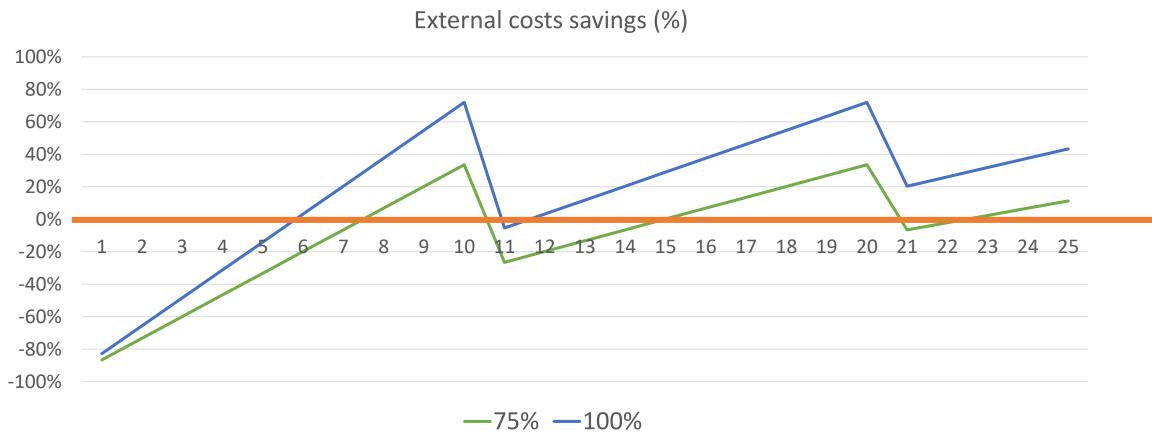
External cost sensitivity analysis







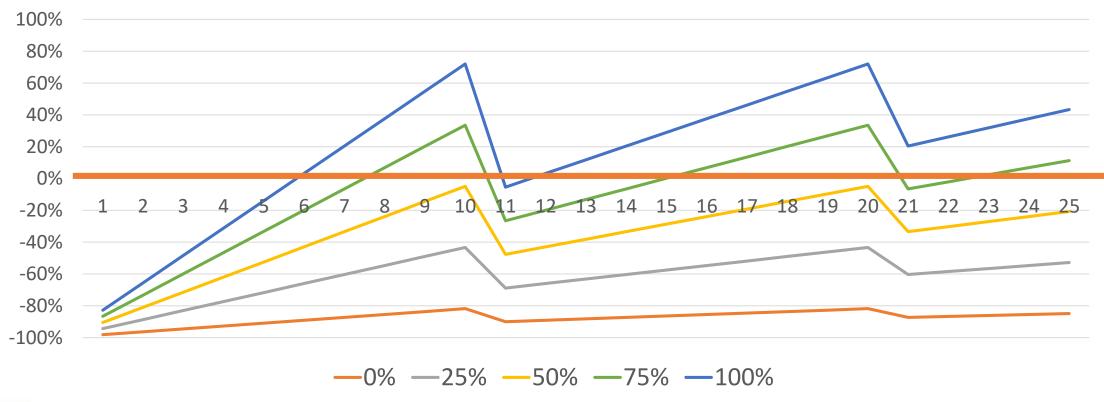
External cost sensitivity analysis





External cost sensitivity analysis







Conclusions

Conclusions

- 1. Best savings when one van is replaced by one cargobike
- 2. Large volumes are challenging due to congestion
- 3. Hubs support the sustainability of cargobikes
- 4. Focus should be on the line haul of hubs
- 5. The developement of cycling lanes reduce impact of cargobikes

Further research with Cairgobike as well!





Contact us!



Prof. dr. Cathy Macharis +32 2 614 83 03 Cathy.Macharis@vub.be Building PL5 (4.37)



Dr. Koen Mommens +32 2 614 83 26 Koen.Mommens@vub.be Building PL5 (4.33)



Nicolas Brusselaers +32 497 32 73 22 Nicolas.Brusselaers@vub.be Building PL5 (4.33)



Prof. Dr. Philippe Lebeau +32 2 629 83 24 Philippe.Lebeau@vub.be Building PL5 (4.37)



Dr. Sara Verlinde +32 2 614 83 43 Sara.Verlinde@vub.be Building PL5 (4.36)



Bart Cok +32 2 629 83 46 Bart.Cok@vub.be Building PL5 (4.40)



Clarissa Kees Clarissa.Kees@vub.be Building PL5 (4.36)

