University of Antwerp
TPR | Research Group Transport and Regional Economics

Department Transport & Regional Economics (TPR)

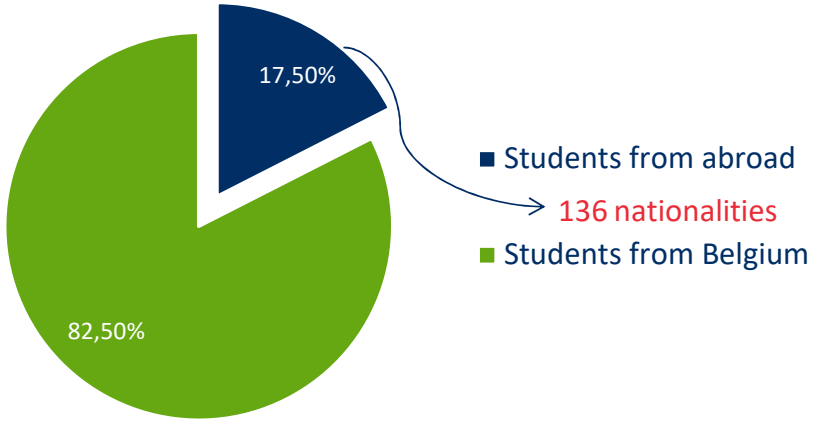
- **ANTWERP**
  capital of Belgian province Antwerp
- **Inhabitants: about 560.000 inhabitants**

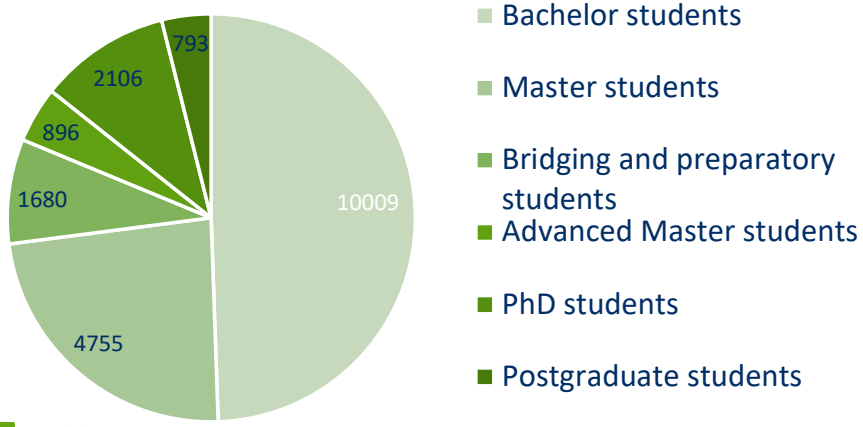
University of Antwerp

- Result of merger of three Antwerp universities in 2003

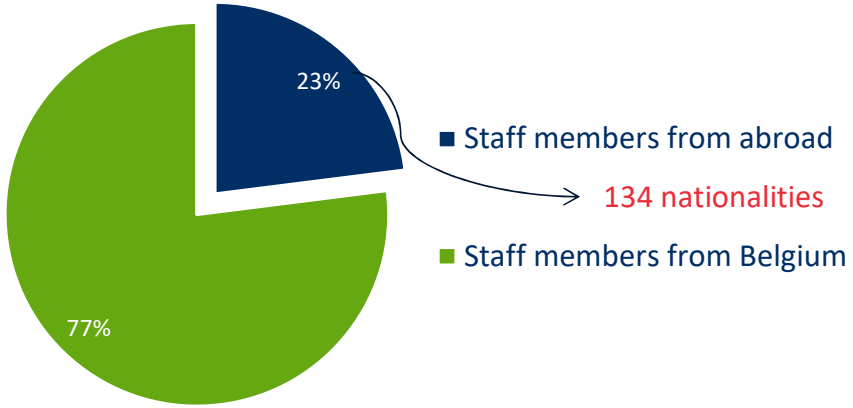
Facts and figures

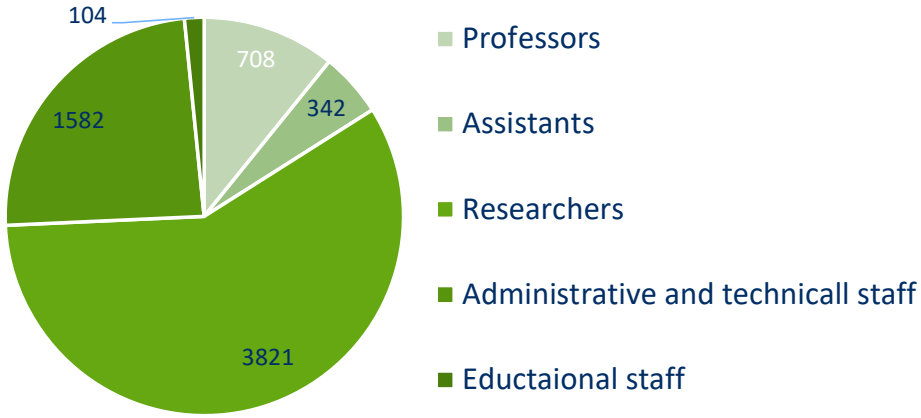
- **21 374 students, 80 000+ alumni**





- **6374 staff members**





Facts and figures (2)

- **Young University Ranking**
- **World University Rankings**
  - Times Higher Education 2021
    - Rank 170
  - QS World Ranking 2021
    - Rank 238
  - Best Global Universities Ranking 2021
    - Rank 212

Facts & Figures (3)

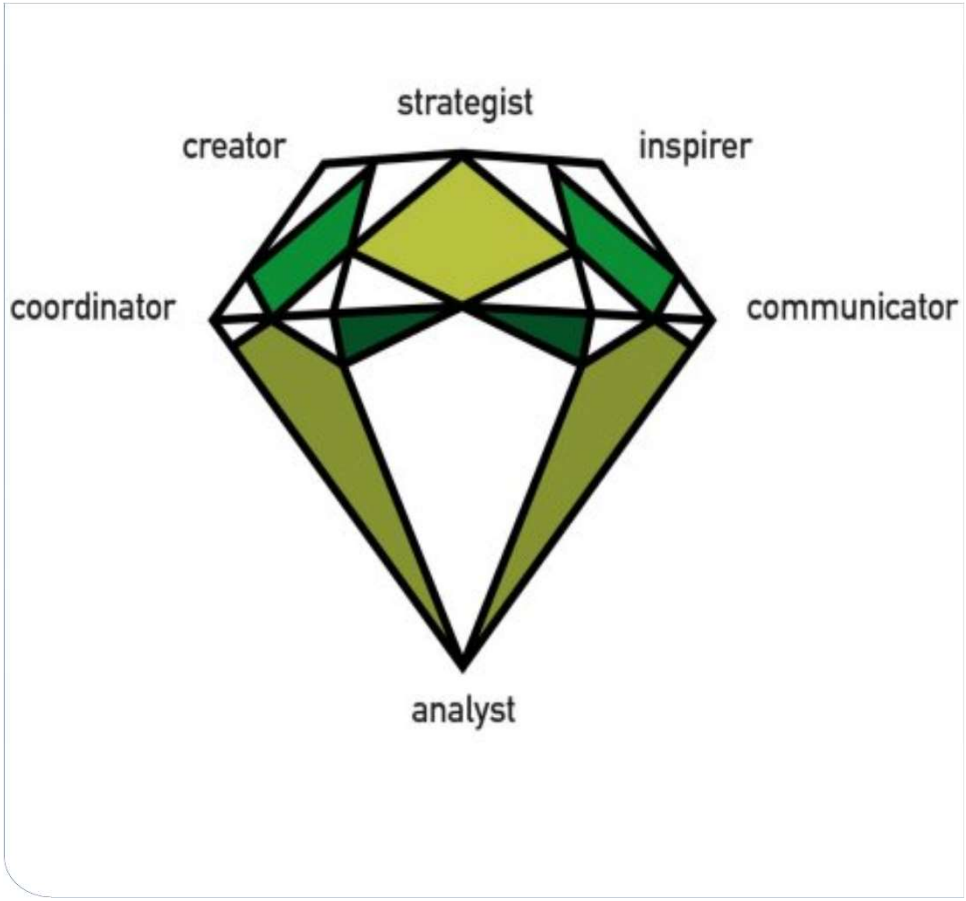
One university, four campuses

9 Faculties

1. Faculty of Pharmaceutical, Biomedical and Veterinary Sciences
2. Faculty of Medicine and Health Sciences
3. Faculty of Arts
4. Faculty of Social Sciences
5. Faculty of Law
6. **Faculty of Business & Economics**
7. Faculty of Science
8. Faculty of Applied Engineering
9. Faculty of Design Sciences

Faculty of Business & Economics

- Oldest Economic faculty in Flanders
- Largest faculty
- 21,6% market share in Flanders



Facts & figures

7 Departments

1. Accountancy and finance
2. Economics
3. Engineering management
4. Management
5. Management information systems
6. Marketing
7. **Transport and regional economics (TPR)**

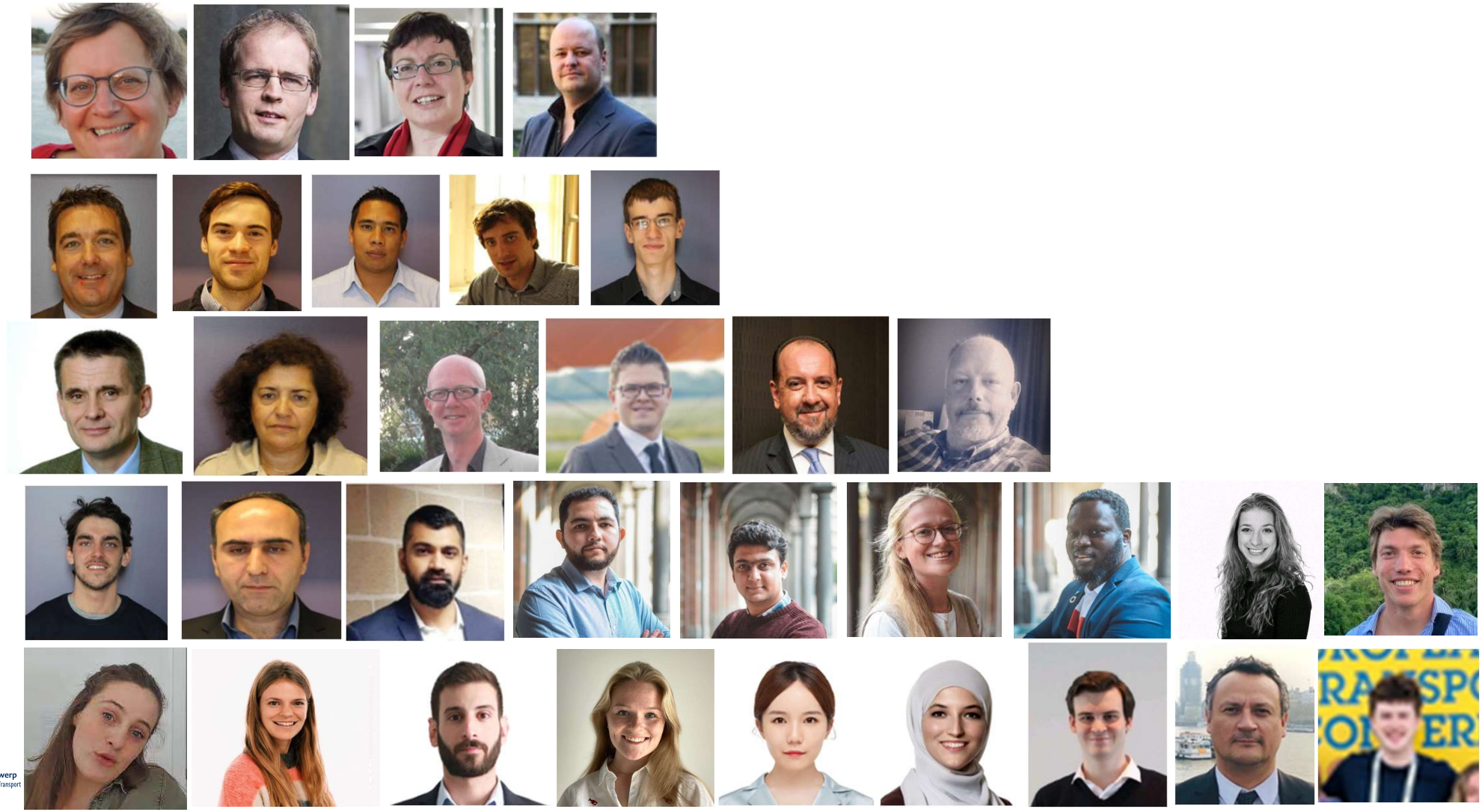
Department of Transport & Regional Economics (TPR)

- International centre of excellence for fundamental and applied academic training, research and service provision in transport economics, logistics and regional economics

TPR in detail

- Staff
- Education
- Research
- International network

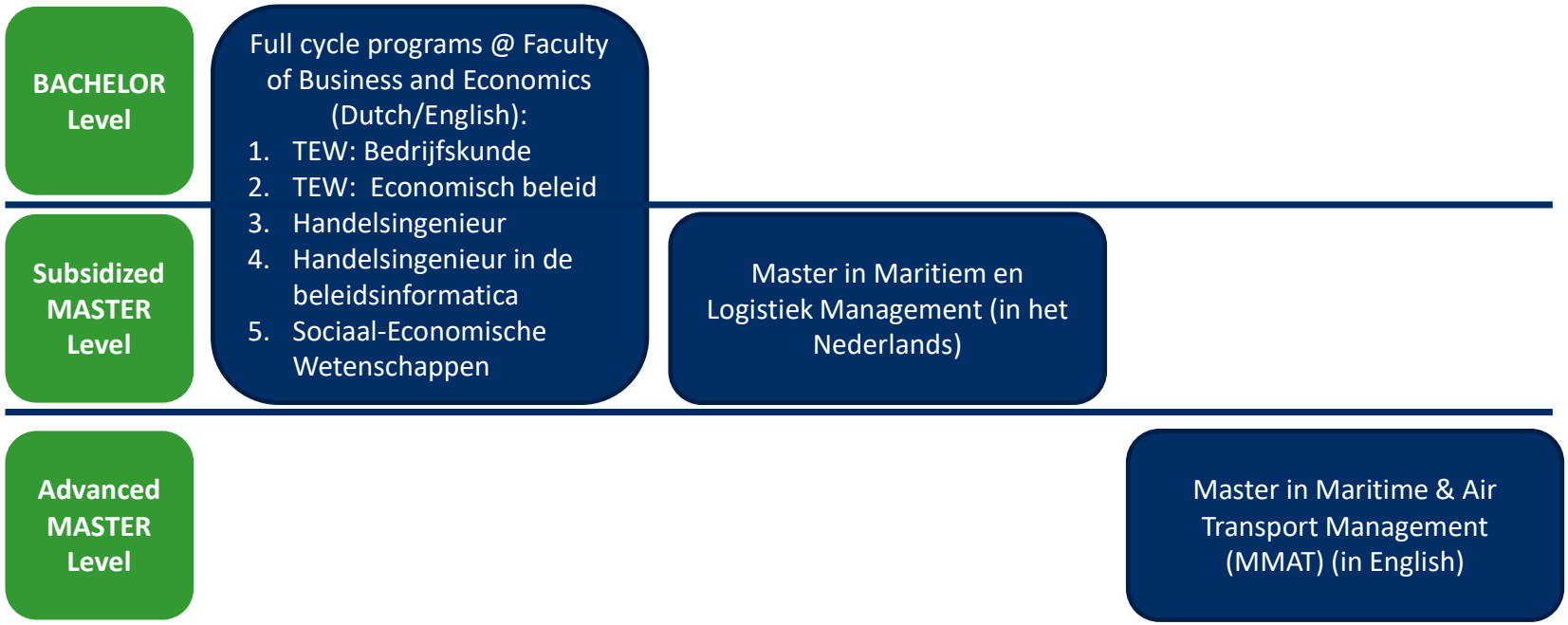
Staff



TPR in detail

- Staff
- Education
- Research
- International network

Education levels



C-MAT

Maritime and Air Transport Management

Obligatory courses (9 ECTS)

Transport Business Economics and Policy (6)
Technology and Innovation (3)

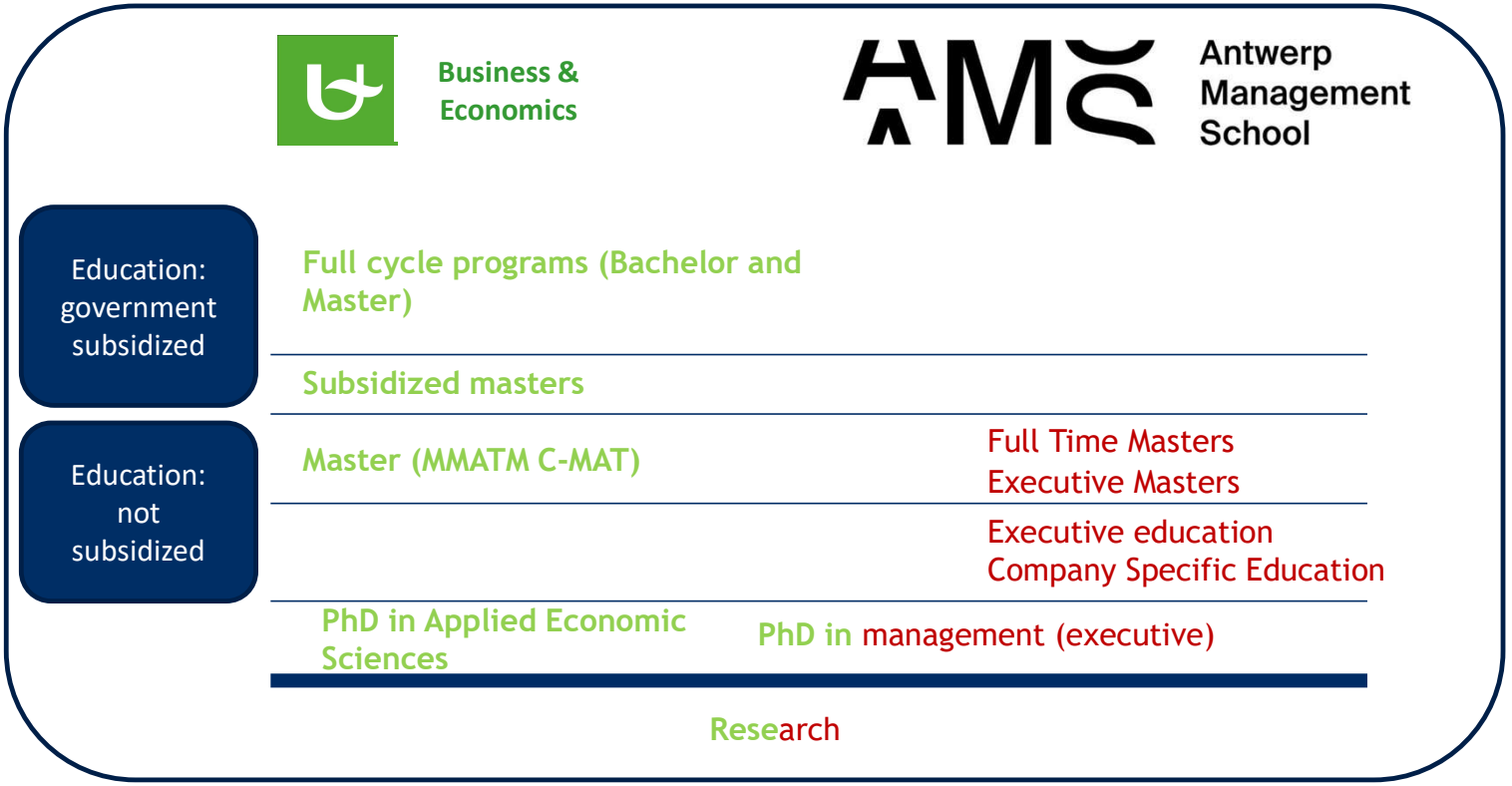
Fundamentals/Options (33 ECTS)

Management Fundamentals	**Research Fundamentals**
The Economics of Strategy (6 ECTS)	Research Methodology (6 ECTS)
Business Environment (6 ECTS)	Advanced Industrial Economics (3 ECTS)
Strategic Management (3 ECTS)	Welfare Economics (3 ECTS)
Capital Budgeting and Financing (3 ECTS)	Transport Modelling (6 ECTS)
Master's dissertation	**Master's dissertation**
Partim I: project methodology (3)	Master dissertation in transport research (15)
Partim II: master dissertation in transport management (12)	

Majors (18 ECTS)

Maritime Transport	**Air Transport**
Port Economics and Business (6)	Air Transport Economics and Business (6)
Maritime Economics and Business (6)	Airport Management (6)
Maritime Supply Chains (6)	Air Transport Pricing Strategies (6)

The relationship with Antwerp Management School



Specific master classes

Antwerp Rail School

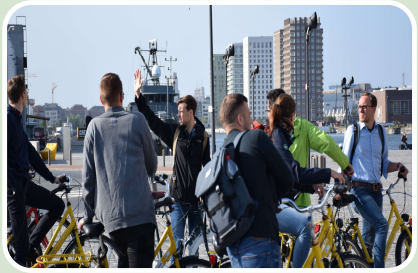
Biennially

(in odd years)

Antwerp Inland Navigation School

Biennially

(in even years)



Summer School Urban Logistics

Annually

Pharma Logistics Summer School

TPR in detail

- Staff
- Education
- Research
- International network

Overview

- **Individual research**
- **Research projects**
  - Fundamental research
  - Applied research
  - Limited assignments intended for immediate application
- **Valorisation: a.o publications, conferences, instruments, spin-offs**

Topical themes

Transversal themes

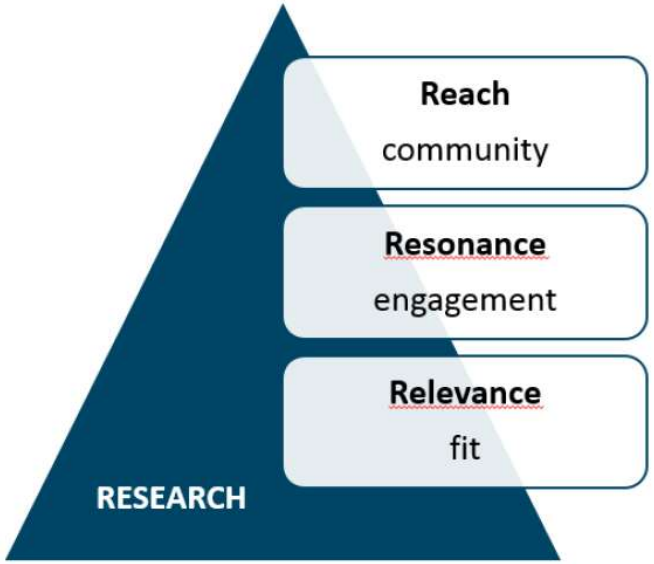
- Infrastructure management and financing
- Innovation
- Chain optimization
- Economic impact
- Sustainability

Chair BNP Paribas Fortis

- BNP Paribas Fortis Chair Ports, transport and logistics

Guide financial institutions in their pursuit of sustainability

- Fundamental and applied research on ethics and finance
- Sharing research insights with investors, students and the general public through presentations and online material
- Raising awareness about sustainable financing



Chair Dennie Lockefeer

Research

- Paper "The future demand for containerized inland shipping on the Rhine"
- Demurrage & detention

Education

- Award for best thesis (2x)
- Antwerp Inland Navigation School

Scientific services

- Series of lectures:
  - 20/01/2020 Inauguration Chair
  - 20/01/2021 'Adequate data, a key step that will benefit inland shipping'
  - 20/01/2022 'Supply chain reality'

Gold

Silver

Bronze

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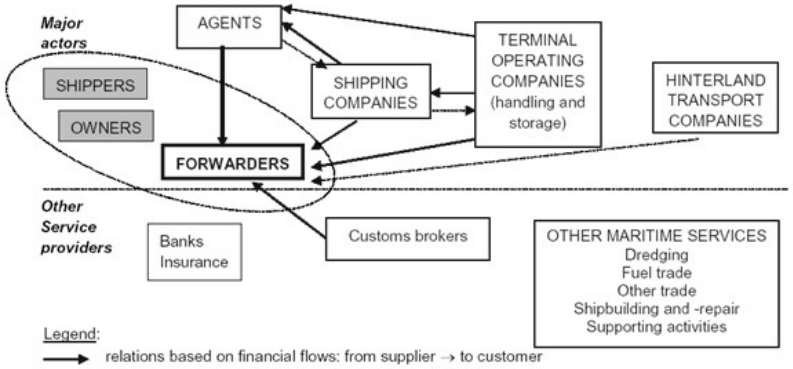
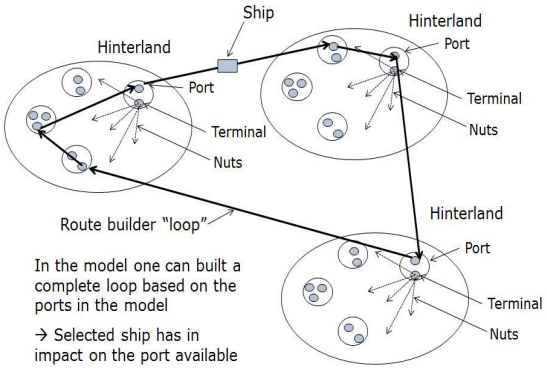
TPR | Research Group Transport and Regional Economics

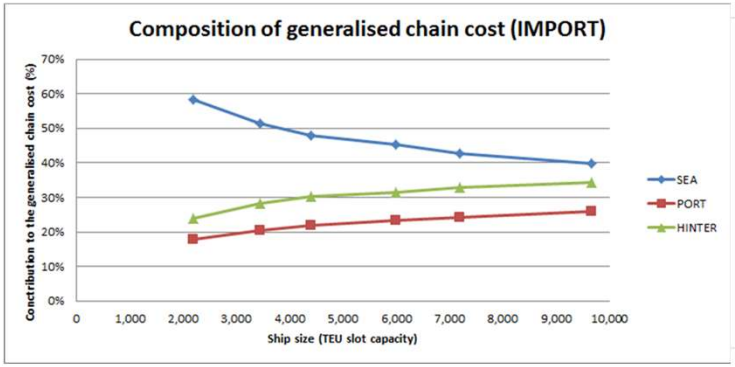
Supply chain

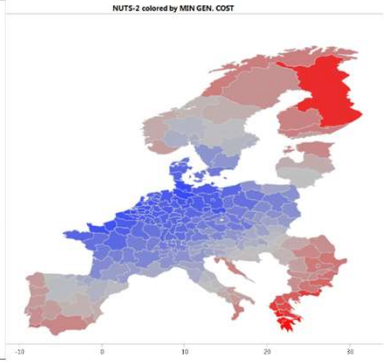
- Relationships between maritime chain actors



- Chain cost model







Port of Antwerp Bruges

Supply chain (2)

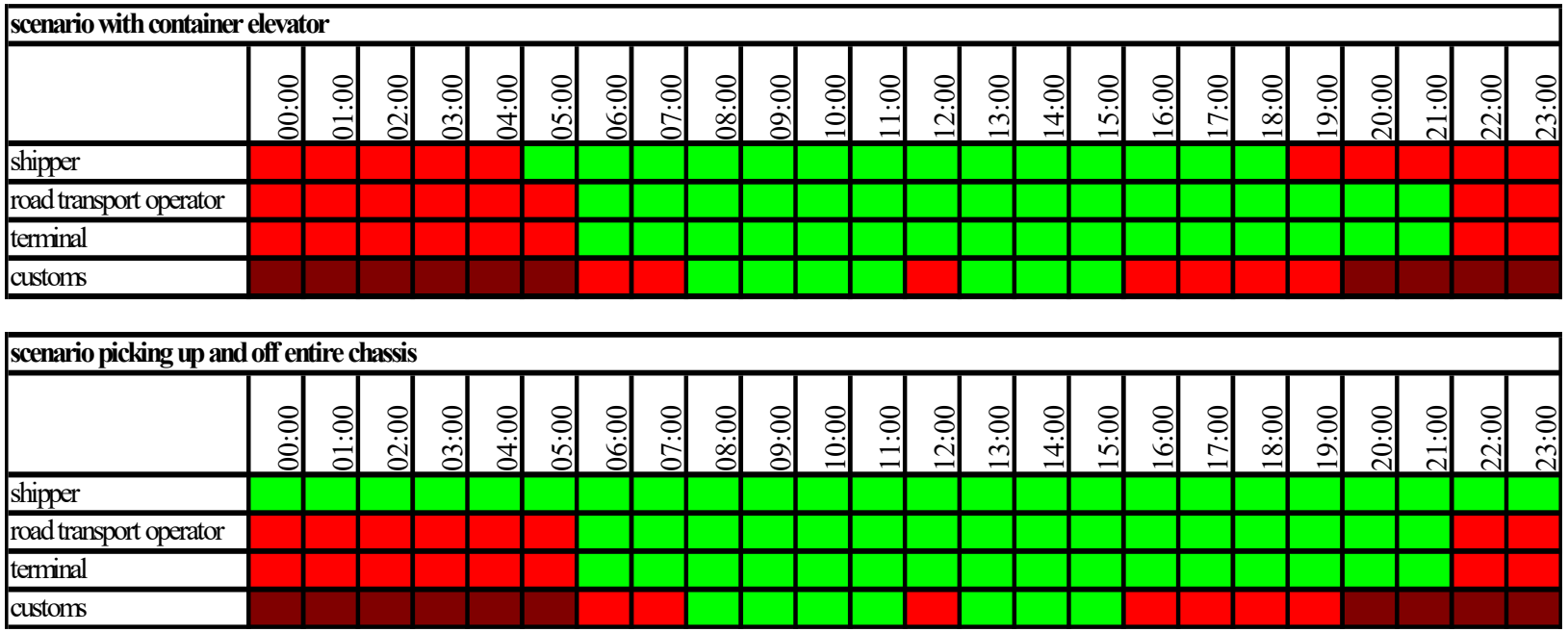
- **Towards the physical internet**

FRONTIER
FUTURE MOBILITY

SYTaDeL: SYnchromodal proTotype for Data Sharing and PLanning

Supply chain (3)

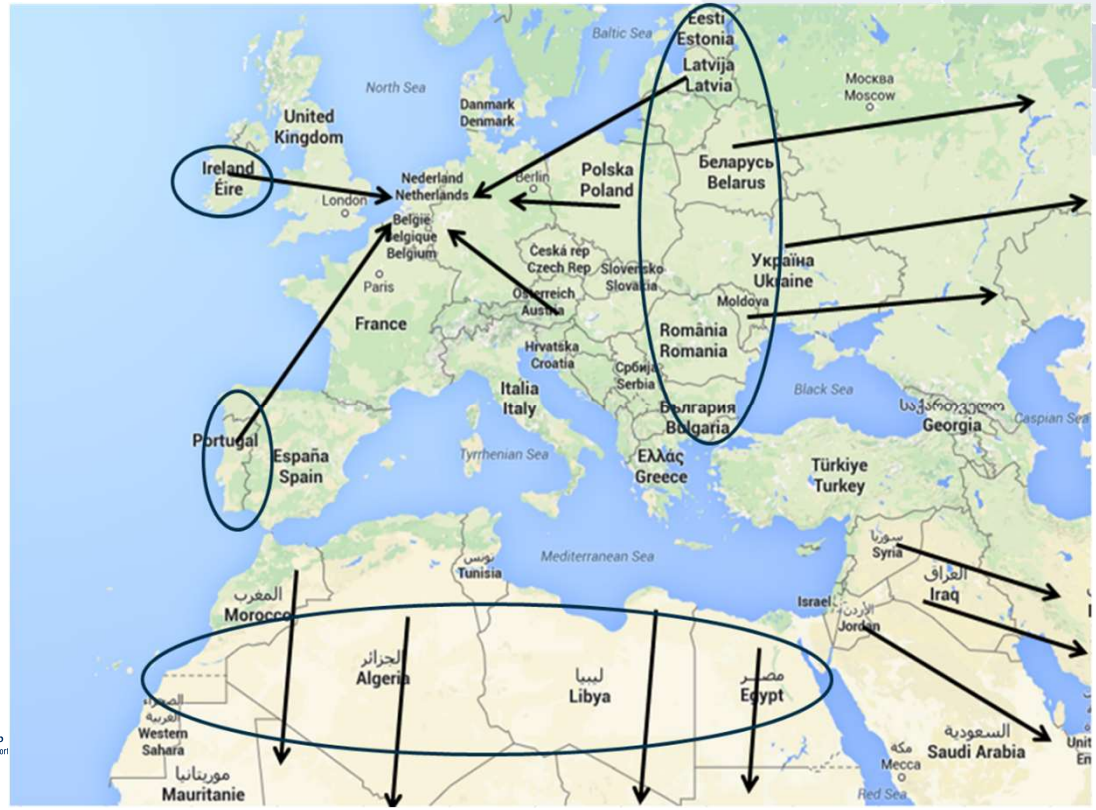
- Chain alignment: night opening



Supply chain (4)

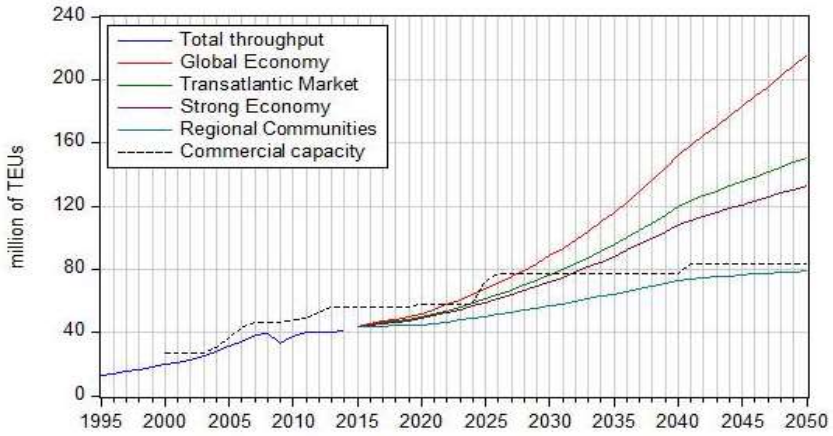
- **Nearshoring**

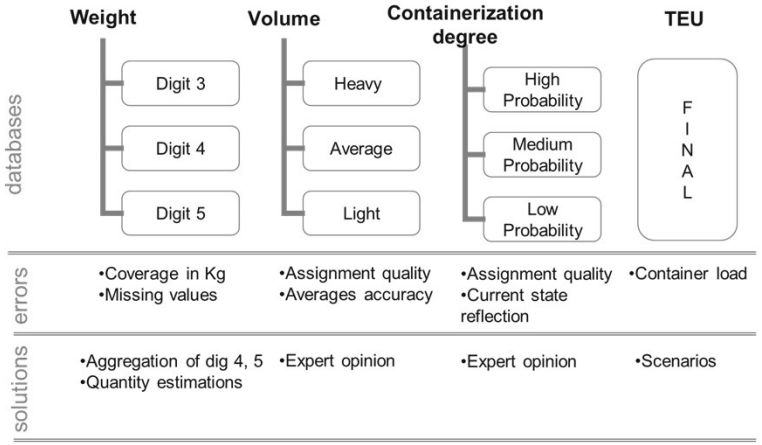
Distance parameter:	Cultural	Administrative	Geographic	Economic
Attributes of distance:	Languages	Colonial ties	Physical distance	Difference in consumer income
	Religions	Monetary union	Lack of common border	Difference in cost and quality of:
	Social norms	Political situation	Sea access	* Natural resources
		Institutional weakness	Infrastructure links	* Financial resources
				* Human resources
				* Infrastructure



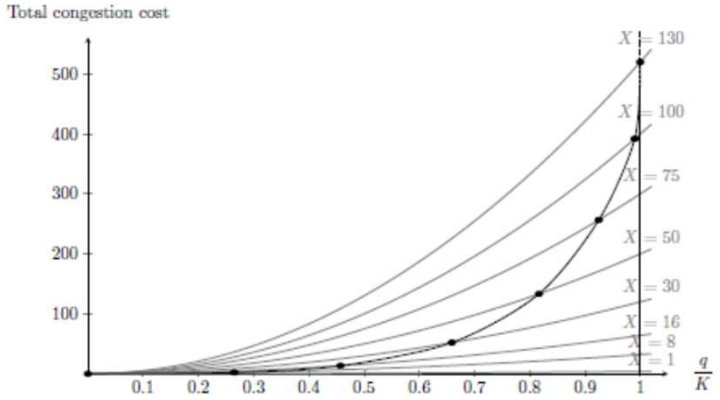
Seaports

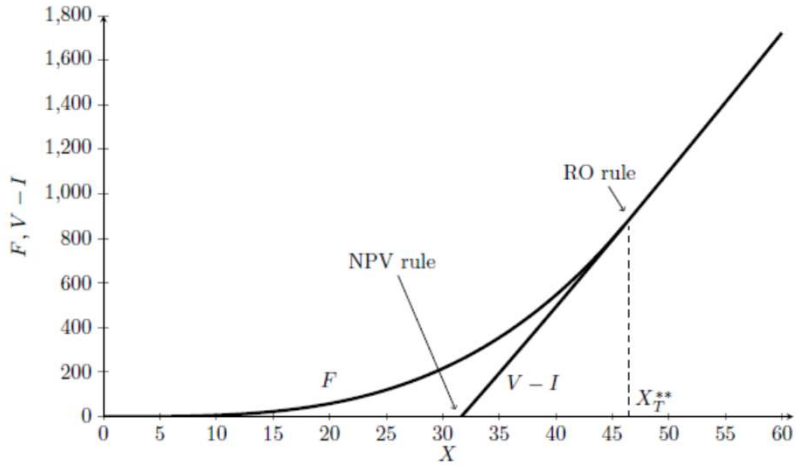
Port traffic forecasting





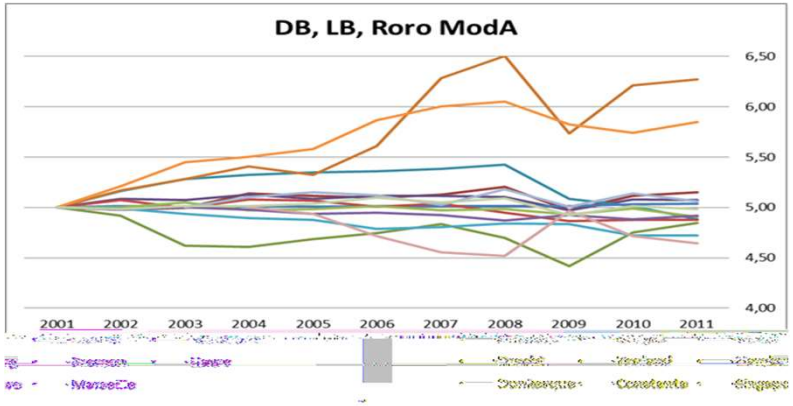
Port capacity investment



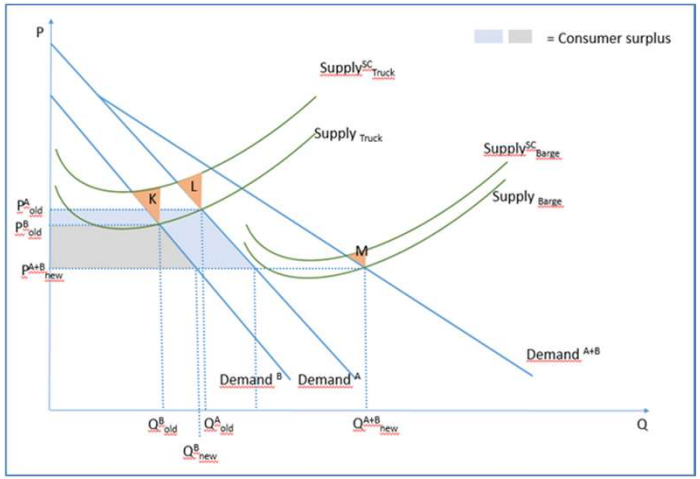


Seaports (2)

- **Port monitoring**



- **Port co-operation**



Seaports (3)

- **Port strategy instruments**

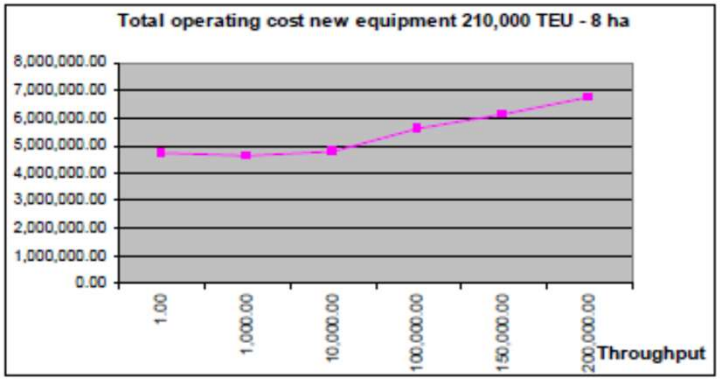
- **Port hinterland mode split**

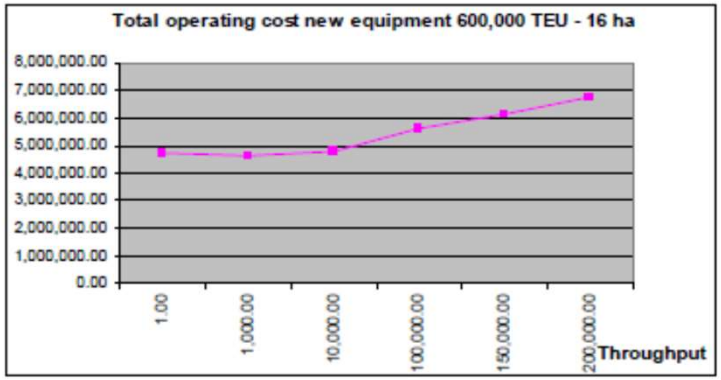
- **Port competitiveness**

- **Port oil spill governance**

Seaports (4)

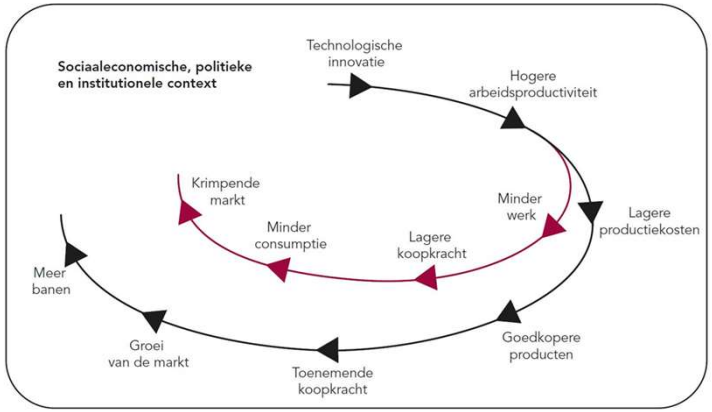
- **Container handling cost structures**





- **Terminal optimization**
- **Future port labour skills**

Provincie Antwerpen



Seaports (5)

PIONEERS
Portable Innovation Open Network for Efficiency and Emissions Reduction Solutions

1. Clean Energy Production, Storage & Supply

Demonstrations in real port environments of solutions and innovations related to green energy production, distribution and supply

- Identification and tackling non-technological barriers
- Green Hydropower Platform for Port Infrastructure
- Realisation of a hydrogen refuelling infrastructure
- Corridor of modular docking stations for energy containers
- Battery storage & smart mgmt of green energy in terminals



PIONEERS

2. Sustainable Port Design

Demonstration in real port environments of green logistics operations and circular/low emission building techniques

- Identification and tackling non-technological barriers
- Local resource recovery for green, circular concrete
- Hydrogen heating for buildings
- Green Straddle Carriers
- Green Last Mile – electric trucks


PIONEERS

3. Modal shift and Flows optimisation

Demonstrate in real-practice port environment the solutions and innovations related to multimodal mobility and flows optimization of passenger and freight

- Identification and tackling non-technological barriers
- Multimodal Connectivity Platforms
- Modal shift in the commute of port employees
- Cargo flow optimisation & prediction
- MaaS Aggregator Platform



PIONEERS

4. Digital transformation

Demonstrate in a real port environment the solutions and innovations related to digitalisation

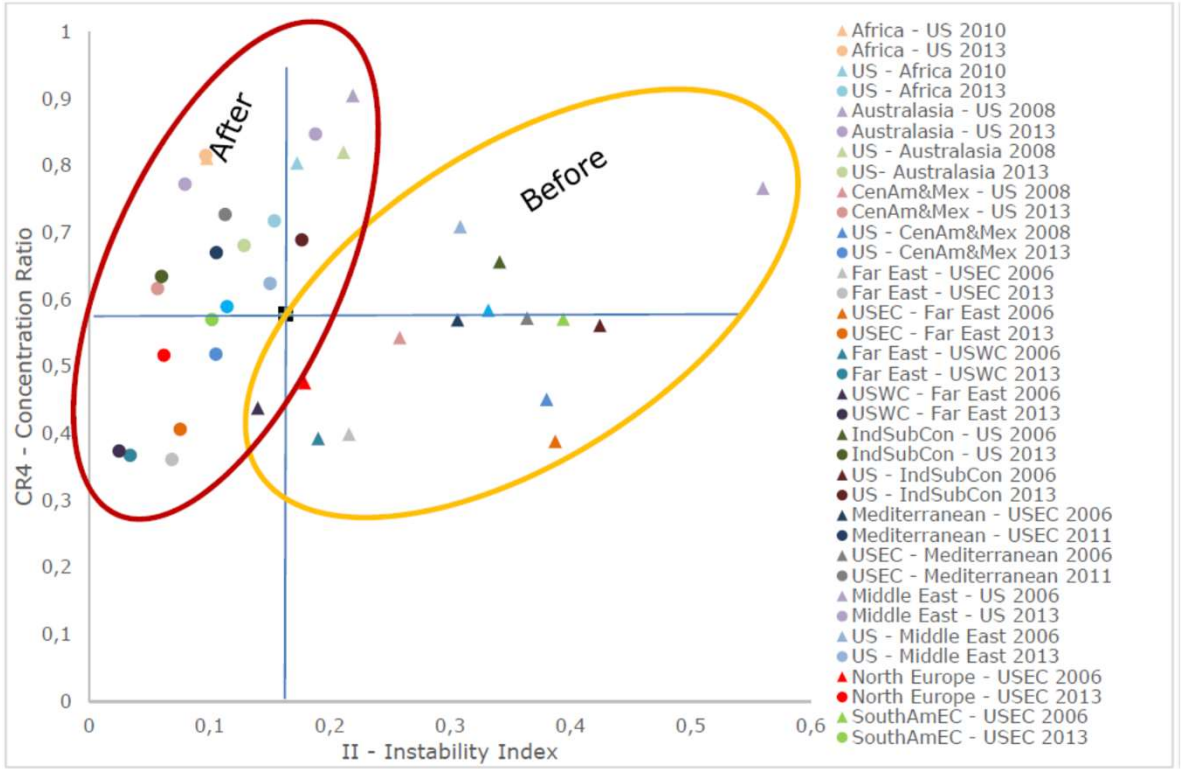
- Technological and non-technological framework conditions
- Connected and automated vehicles
- Digital Twin
- Vessel traffic optimisation
- Maritime 5G
- Container transport forecast



PIONEERS

Maritime

- **Market concentration**

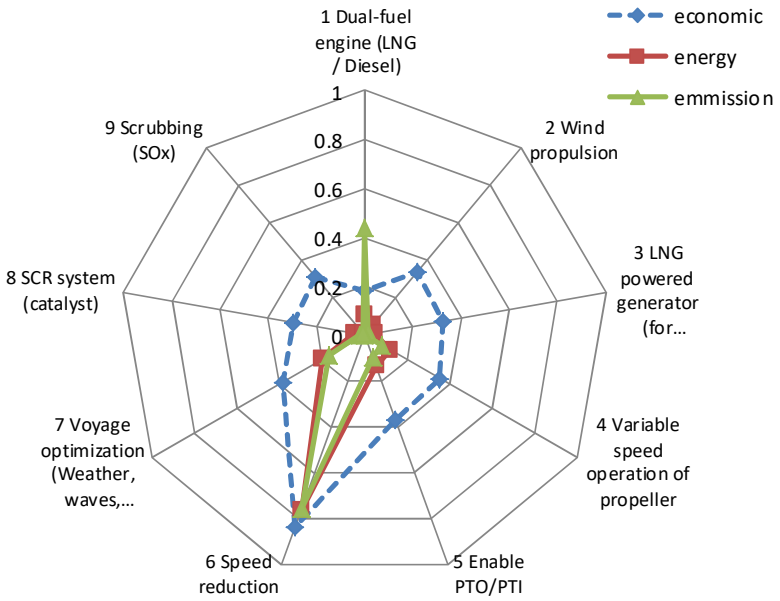


Maritime (2)

- **Ballast water**

Rijkswaterstaat
Ministry of Infrastructure and Water Management

- **Ship retrofitting**



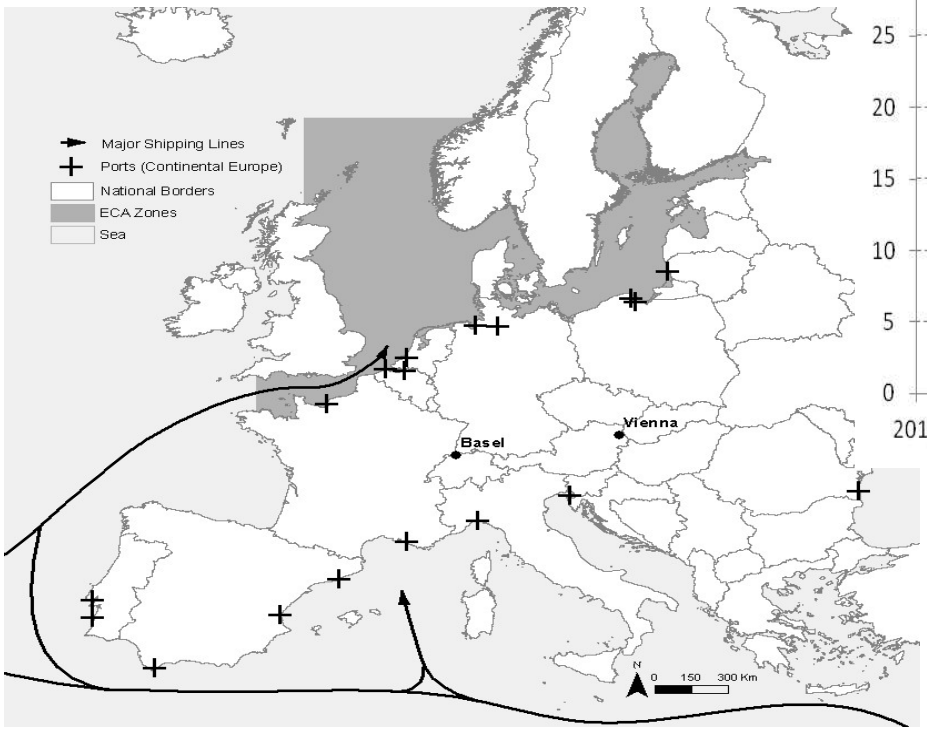
RETROFIT

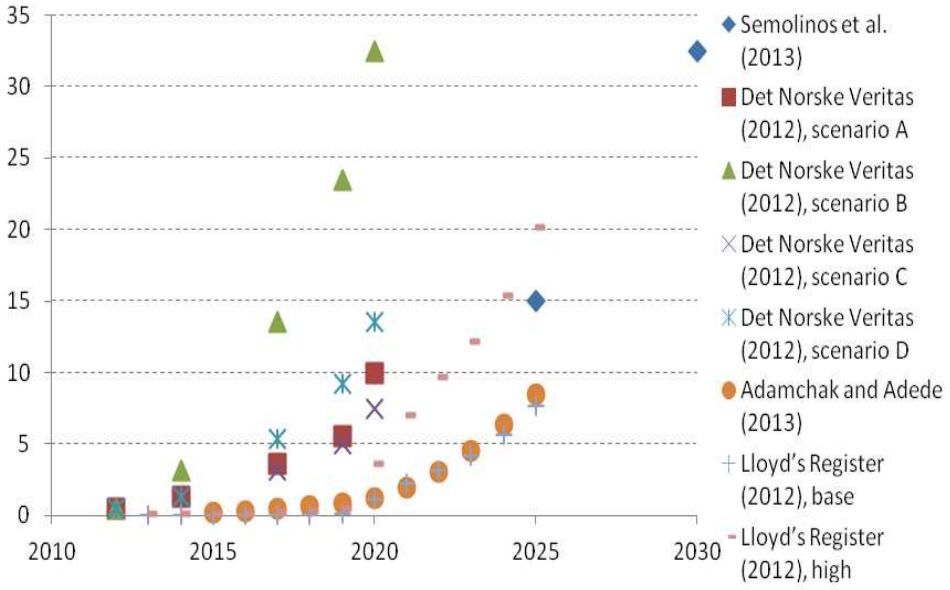
- **Study on the emission reduction of the three main shipping segments given international regulation**

OECD

Maritime (3)

- **LNG bunkering market analysis**



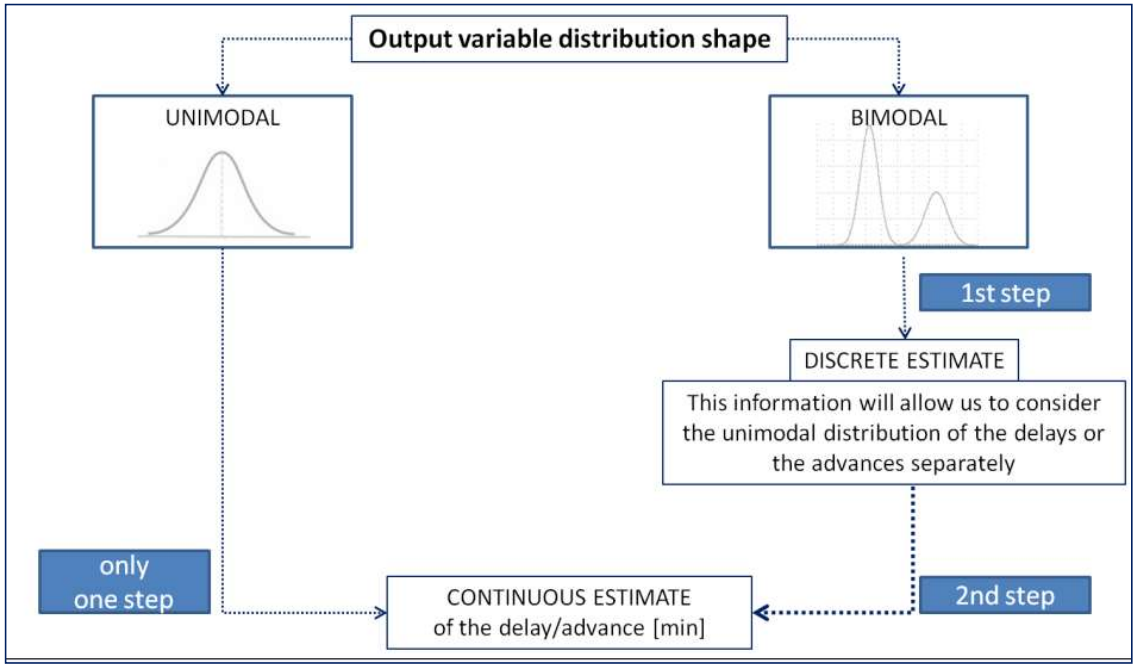


Effect Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
PRICE	21,441	1	<,0001*
PROP_F	14,848	1	0,0001*
COST_OTH	20,950	4	0,0003*
GEO	14,138	2	0,0009*
P_CONGESTION	6,748	2	0,0342*
PROP_P	5,098	2	0,0781

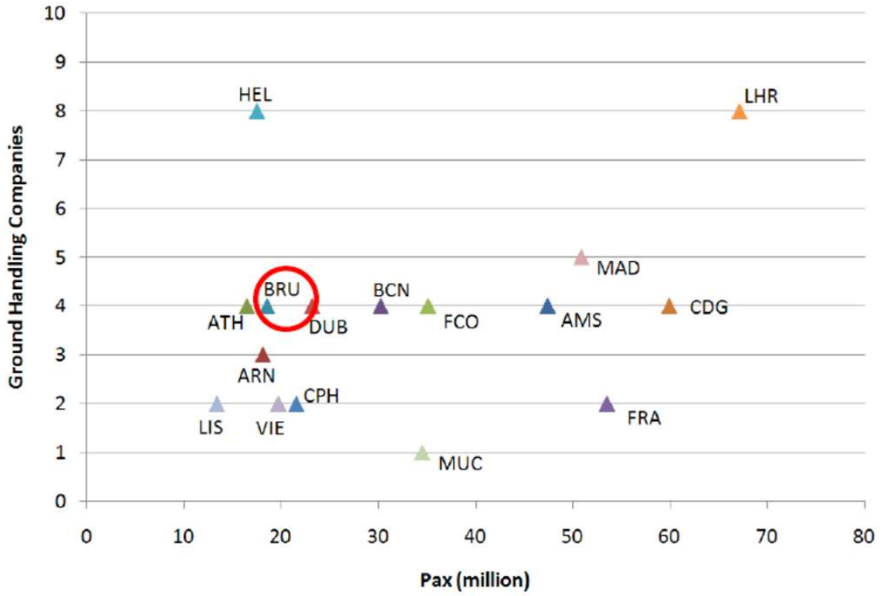
Maritime (4)

- **Ship arrival forecasting**



Airports

- **Ground handling services**



Federale Overheidsdienst
Mobiliteit en Vervoer

- **Airport market regulation**
- **Impact of shutdown**

Federale Overheidsdienst
Mobiliteit en Vervoer

European Parliament

Airports (2)

- BRU freight + incentive strategy
- Ostend airport market strategy
- SCBA Flemish airports
- Air traffic control management
- Freight airport selection
- Airport accessibility analysis
- Economies of scope airport passenger / freight
- Airport security

Airports (3)

TULIPS

Innovative & sustainable airports

TULIPS accelerates the implementation of innovative and sustainable technologies to reduce emissions at airports.

Green Deal | CINEA

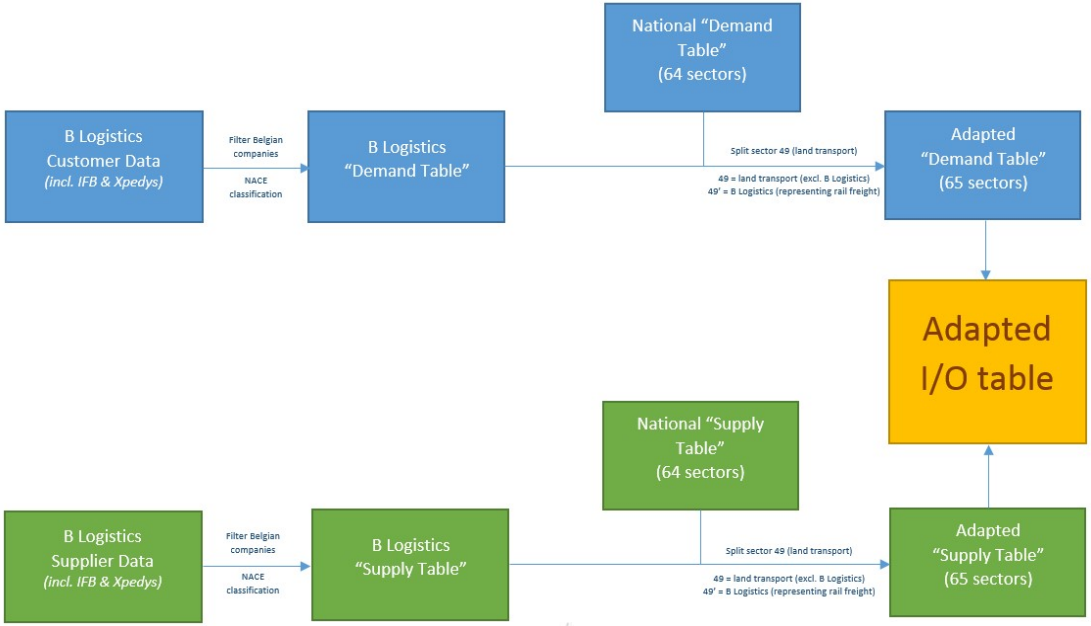
Air transport

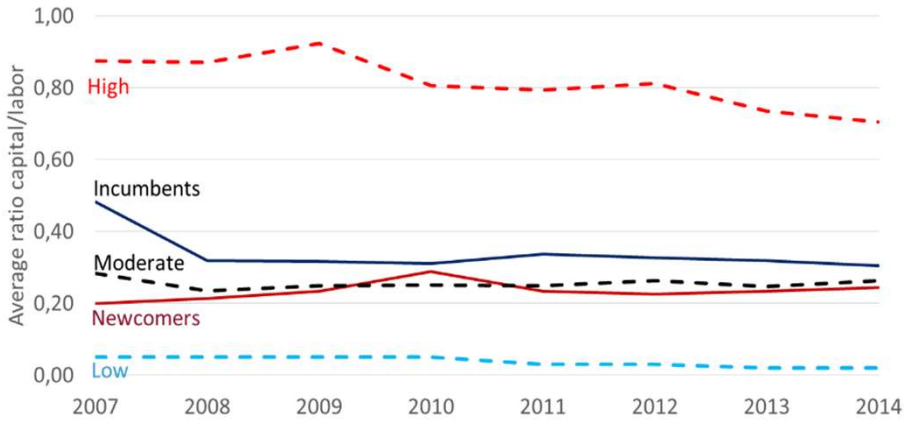
- Forecasting

- Airline website compliance
- Low cost airline market policy
- Air Crisis
- Education and skills
- Competition from rail
- Integrator economies of scale
- Freight market analysis

Rail

- **BRAIN-TRAINS**





BRAINTRAINS

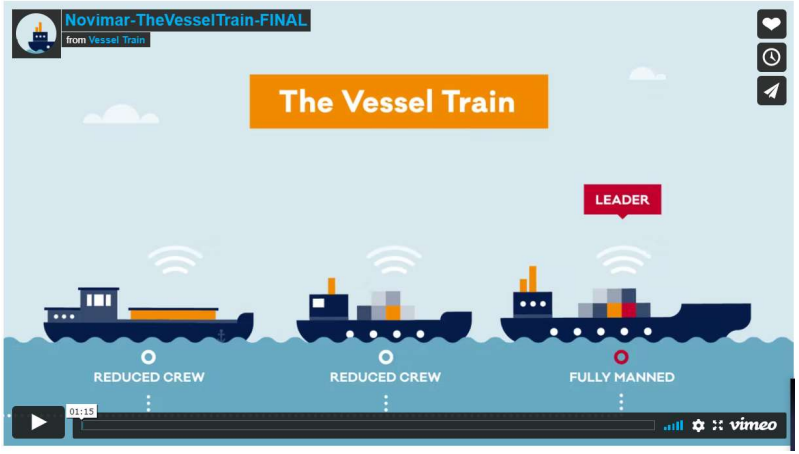
belspo

Rail (2)

- Short-distance rail services
- LowCarb: Strategies for Rail Freight on the East-West Corridor through North-Rhine Westphalia
- High speed rail market
- 2nd rail access Port of Antwerp

Inland navigation

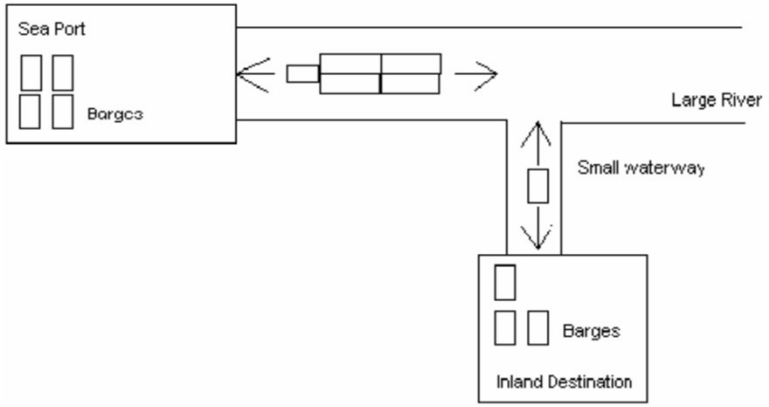
- **NOVIMAR: vessel train**

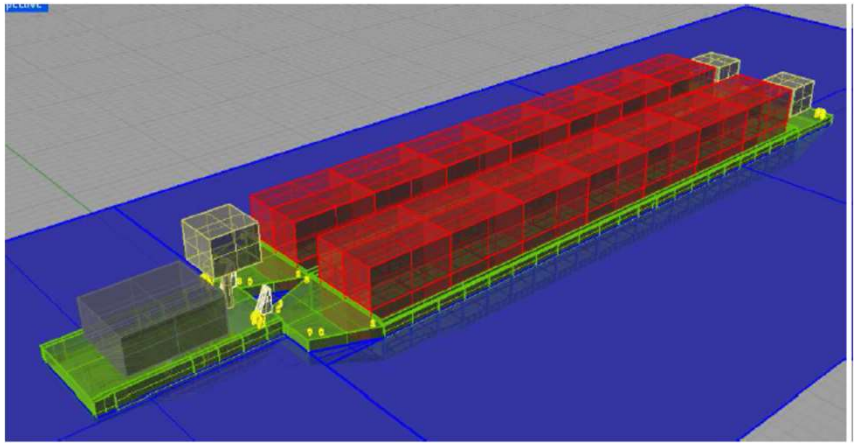


- **NOVIMOVE**

Smart & sustainable waterways

- **Small barge concept**





Inland navigation (2)

- **Smart docking**
- **Smart Waterway**
- INN-IN INNOVATIVE INLAND NAVIGATION

CCNR COMMISSION CENTRALE POUR LA NAVIGATION DU RHIN

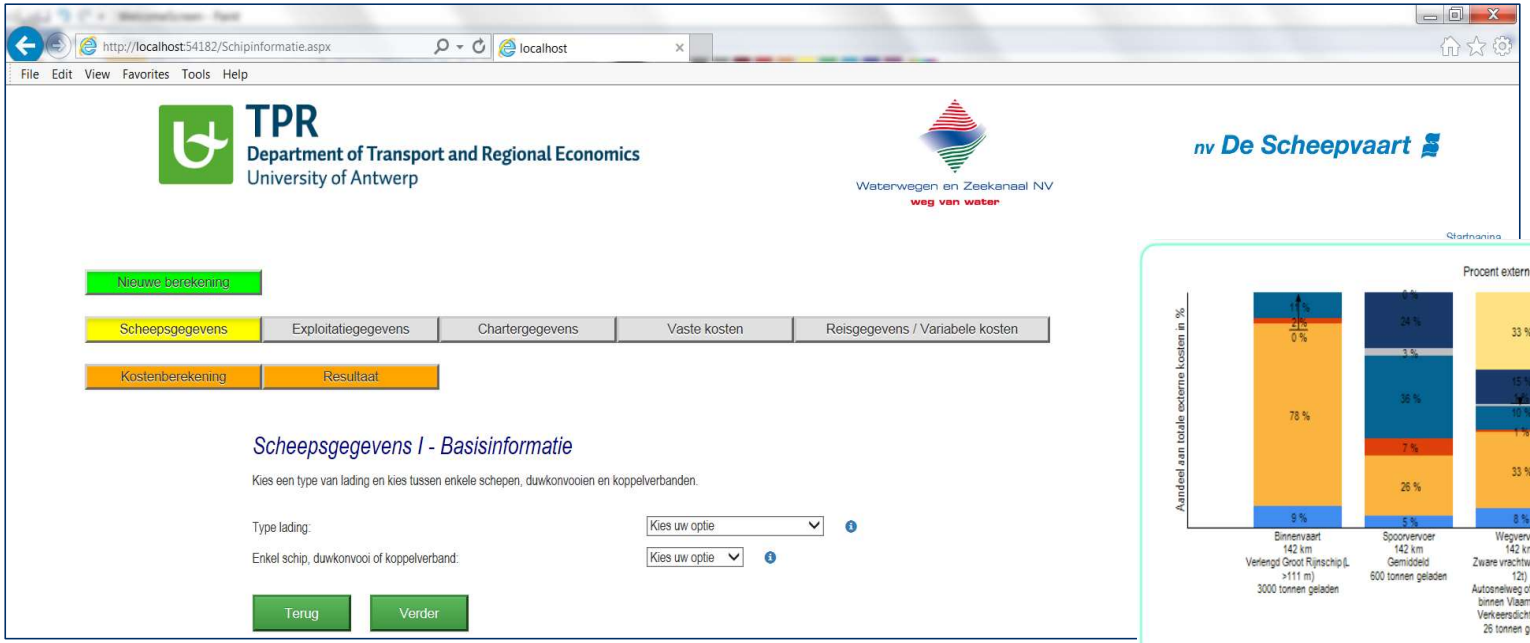
- **Evaluation of the RIS Directive**

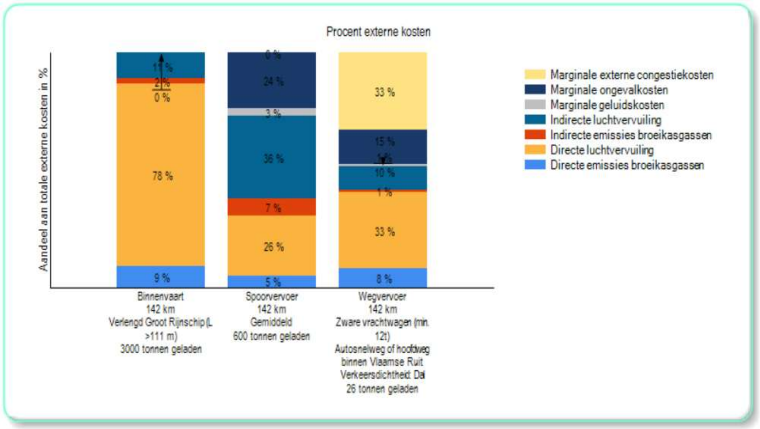
RIS EXPERT GROUPS SUPPORT

European Commission

Inland navigation (3)

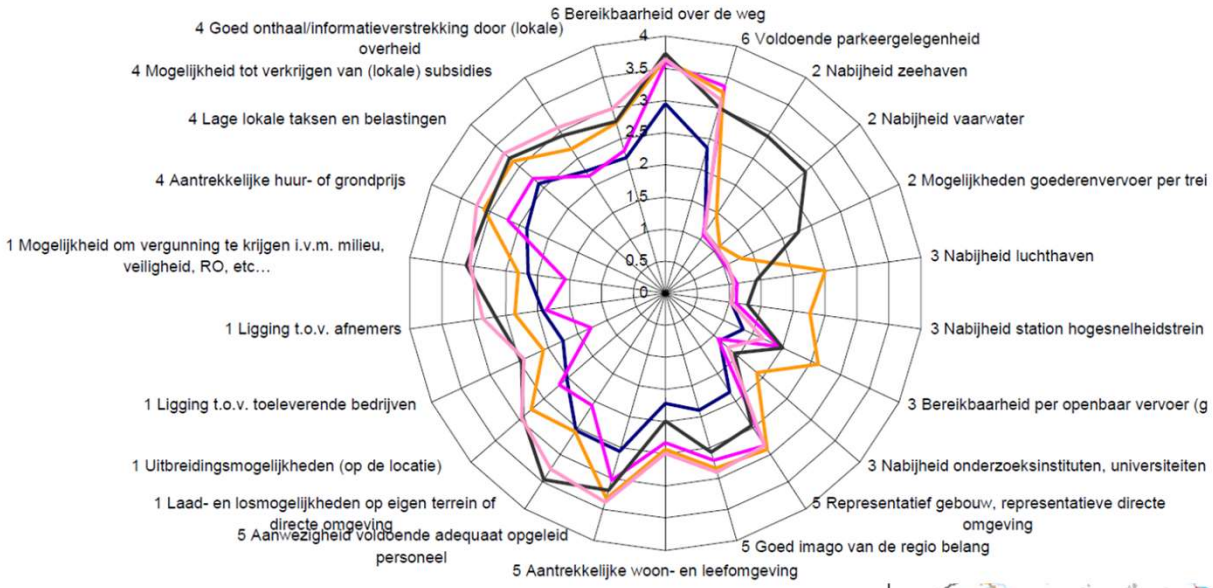
- **Inland navigation cost model**



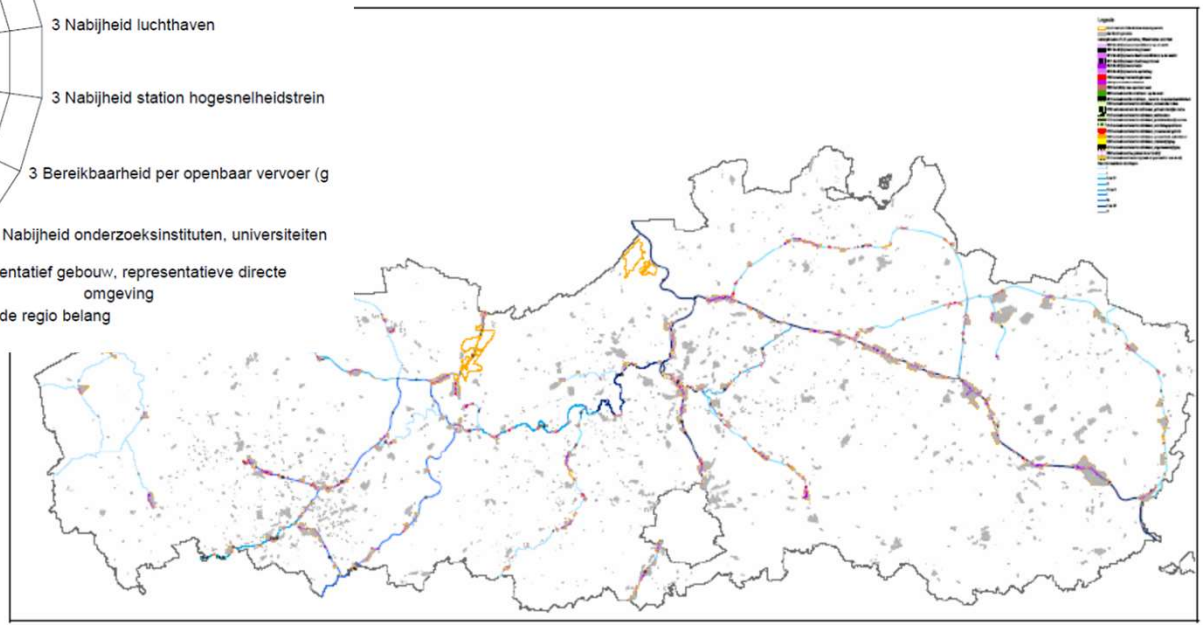


Inland navigation (4)

- **Waterbound estates**



Flanders
State of the art



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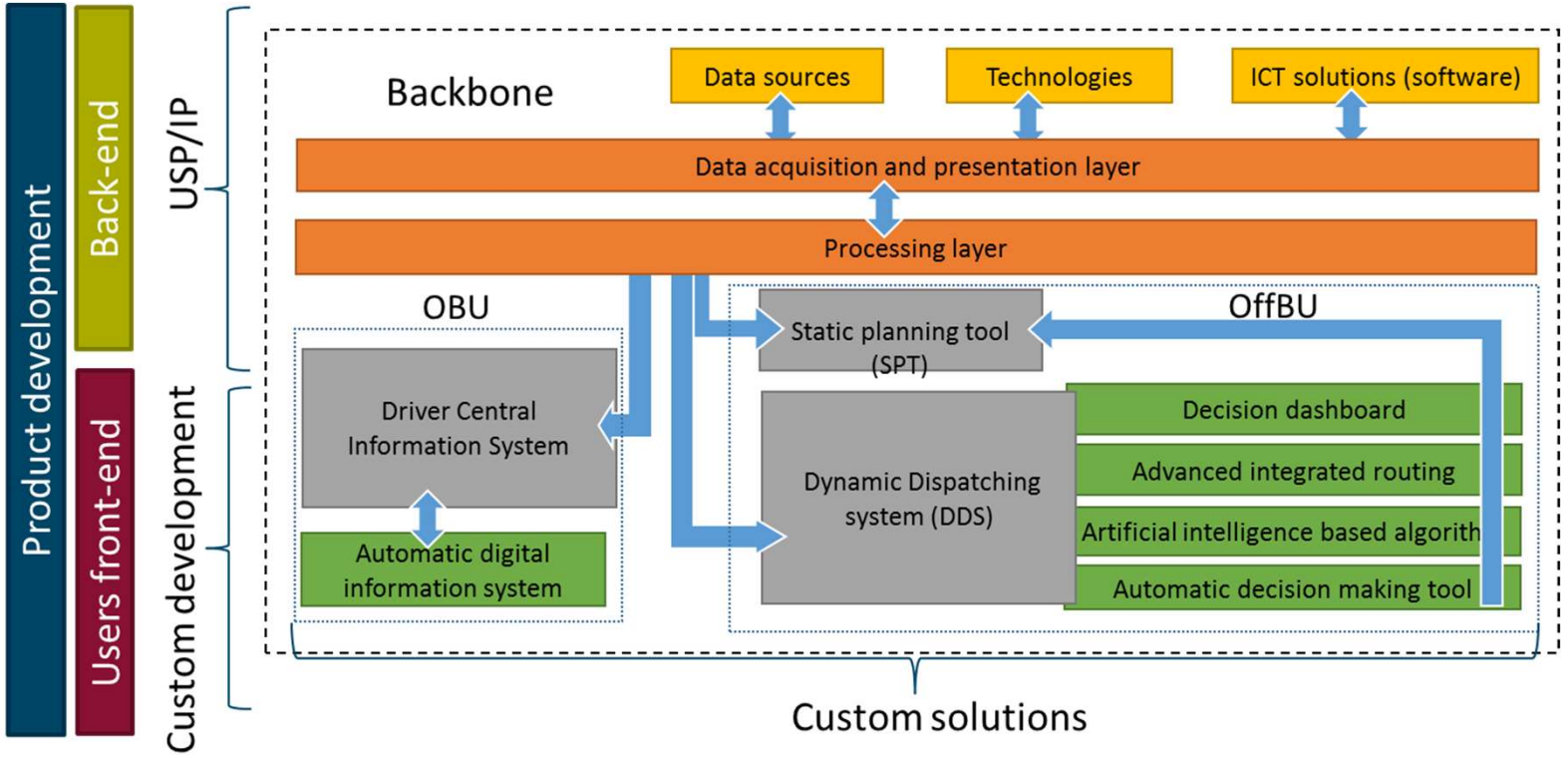
Road

- **Proof of concept: Data integration in road transport**

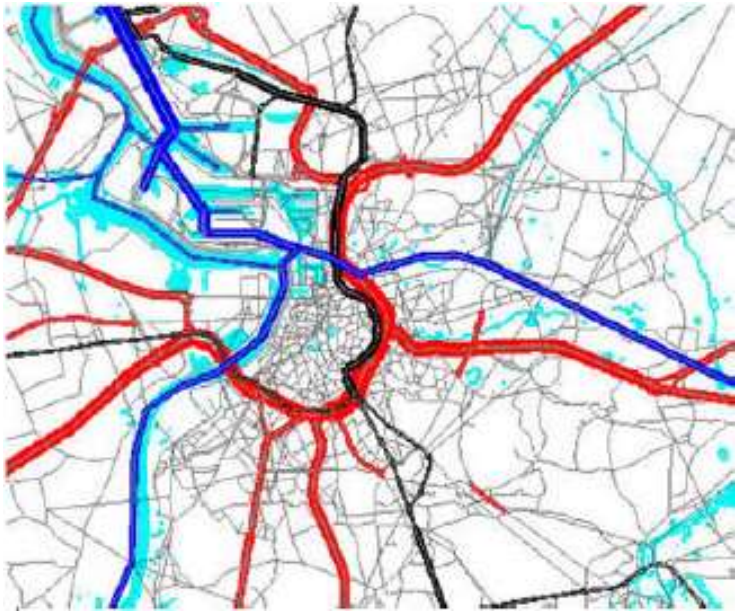


DIGITRANS

Road (2)

- **Port truck guidance**

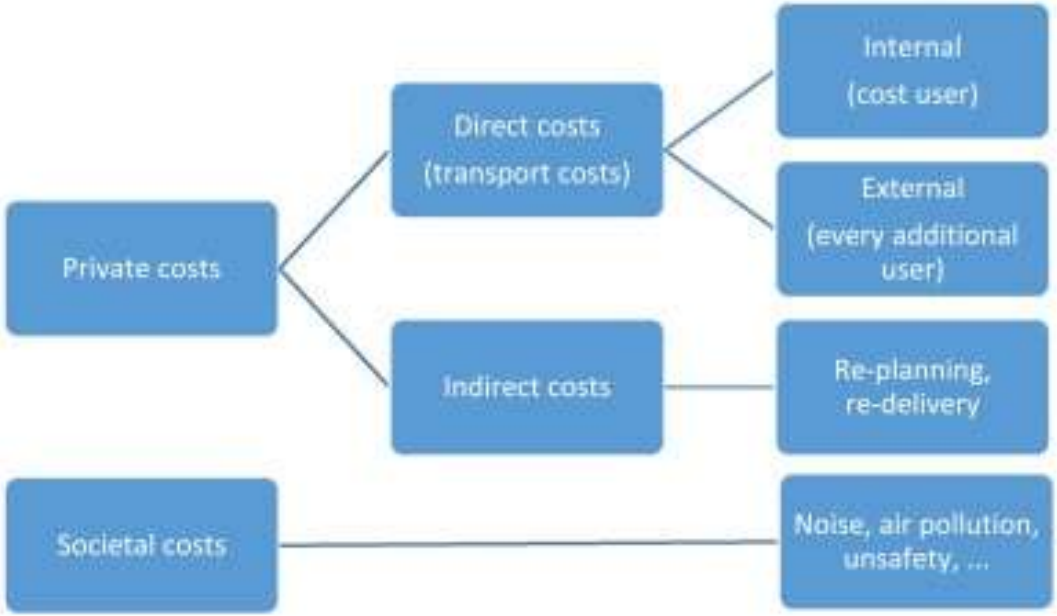
- **Validation of Strategic Freight Model Flanders**
- **E313 motorway extension**
- **Logibat**



Road (3)

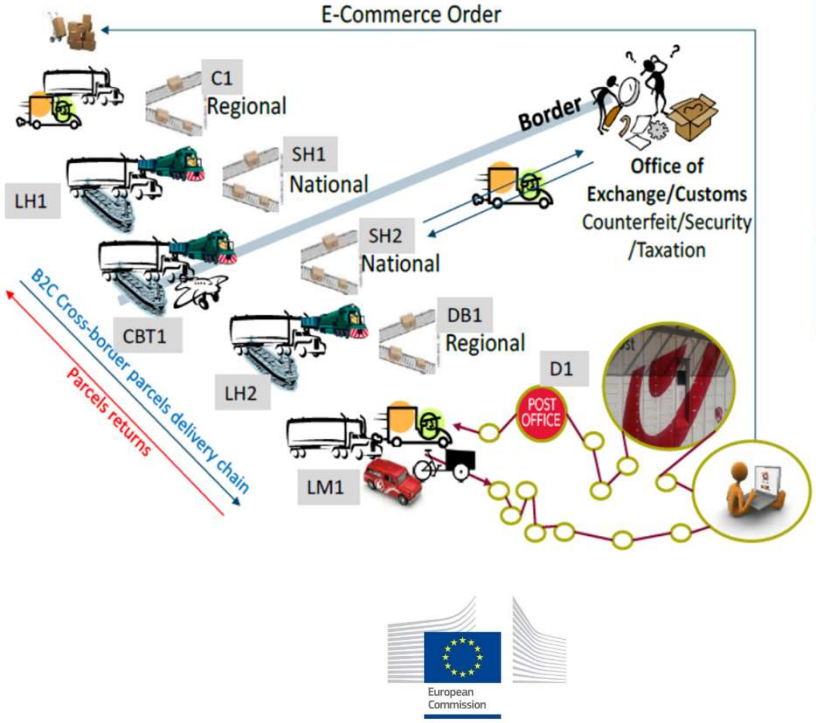
- **Impact kilometre charge**
- **Congestion cost model**

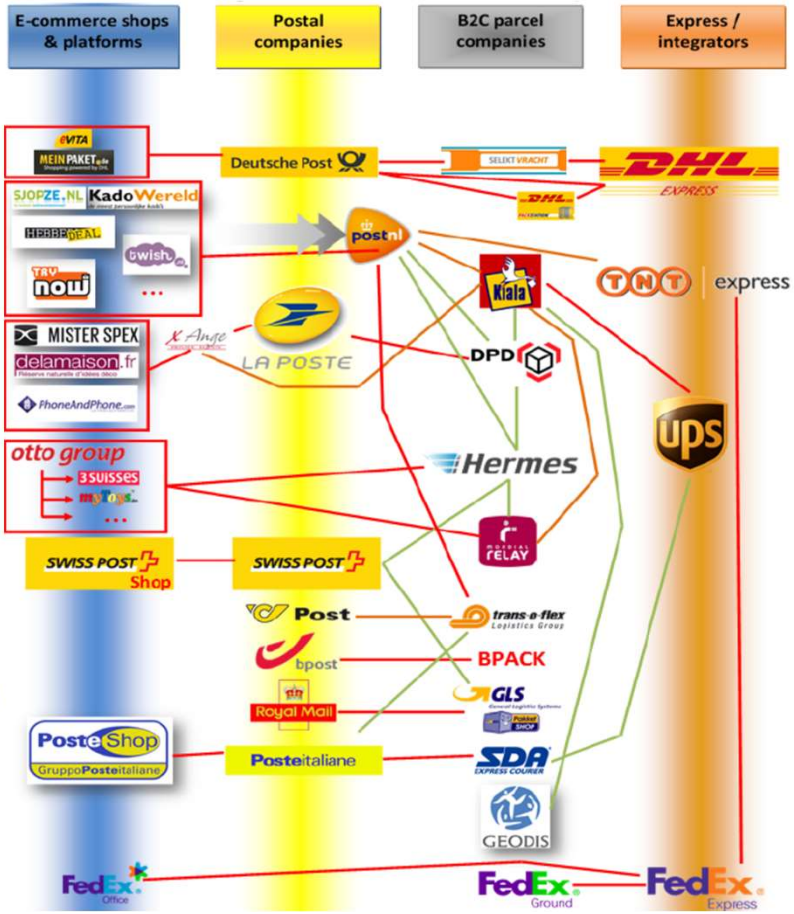
Flanders
State of the art



Logistics

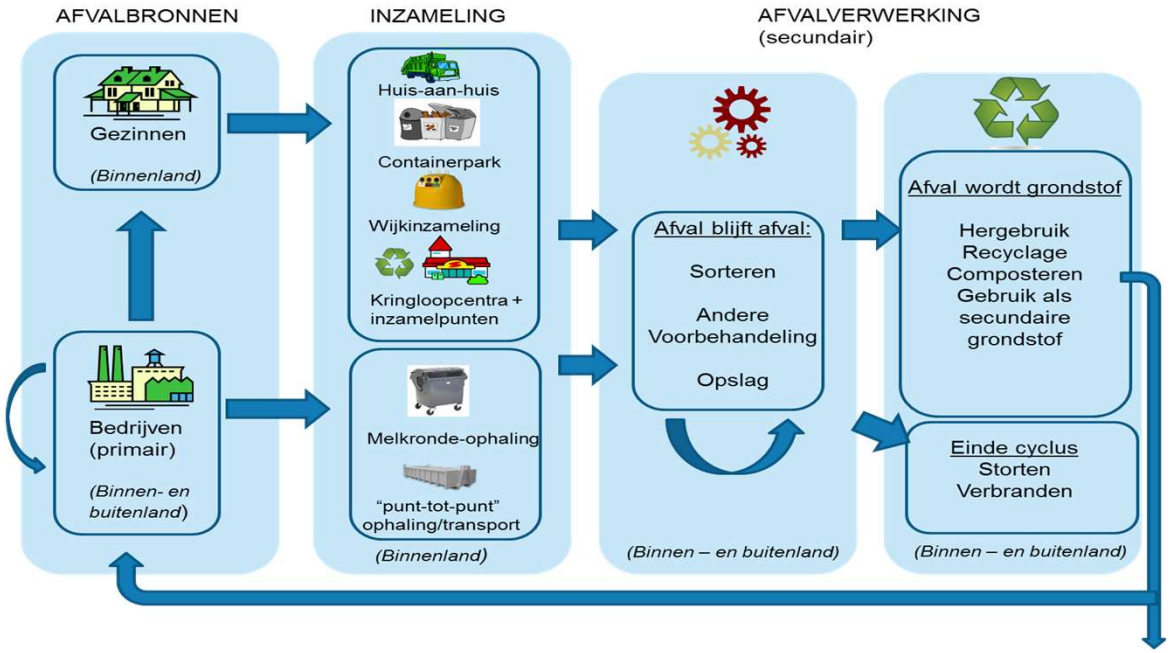
- **Cross-border parcel delivery**





Logistics (2)

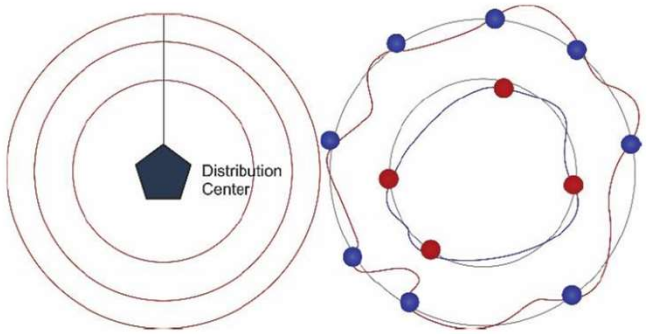
- **Waste logistics**

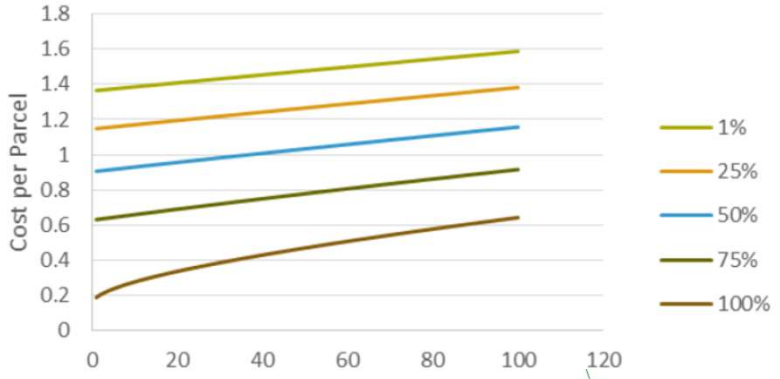


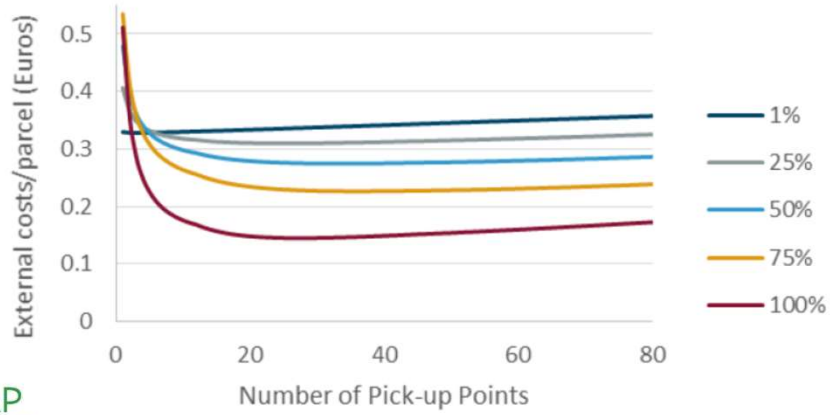
- **Circular economy**
- **Biomass logistics**

Urban logistics

- **E-commerce**







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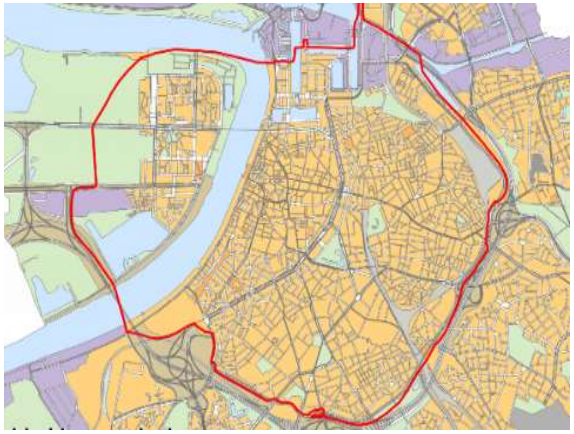
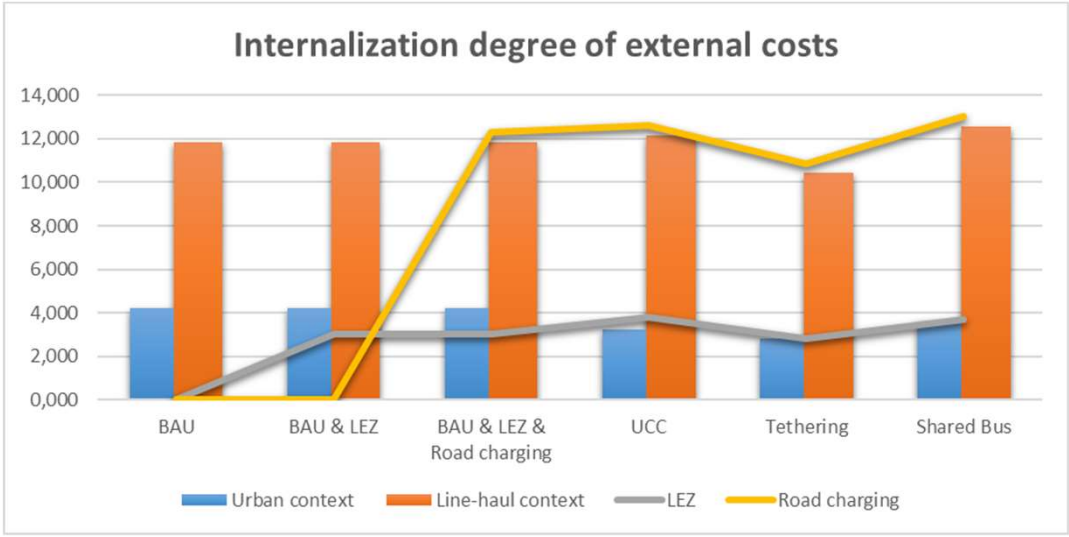
AGENTSCHAP INNOVEREN & ONDERNEMEN

P&G

Urban logistics (2)

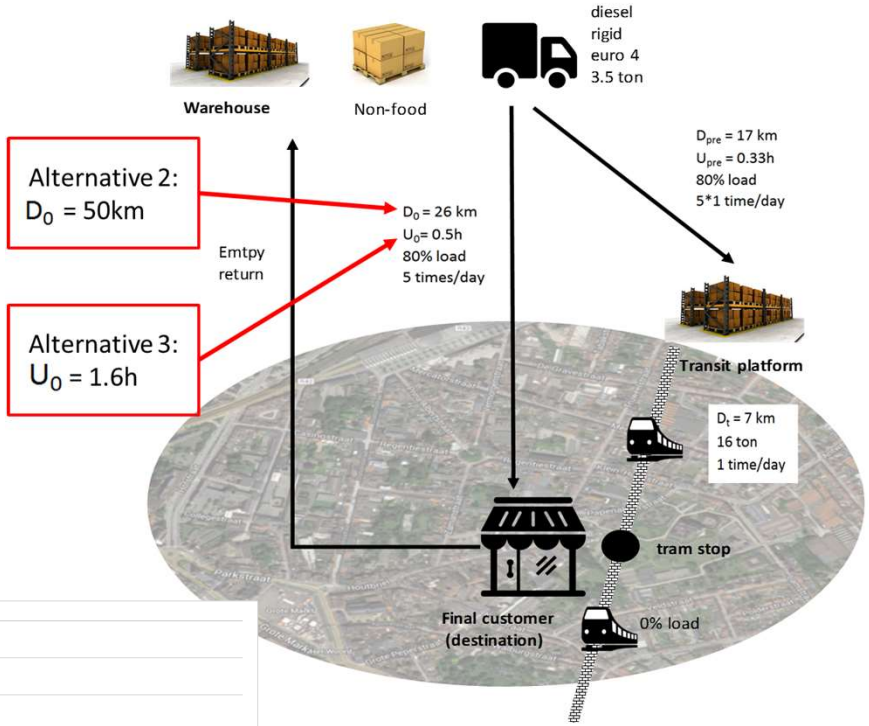
- **Retail**

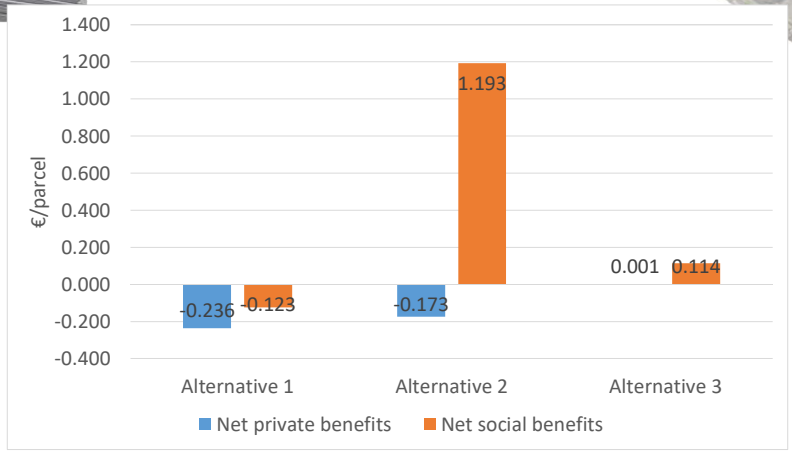




Urban logistics (3)

- **Cargo tram**





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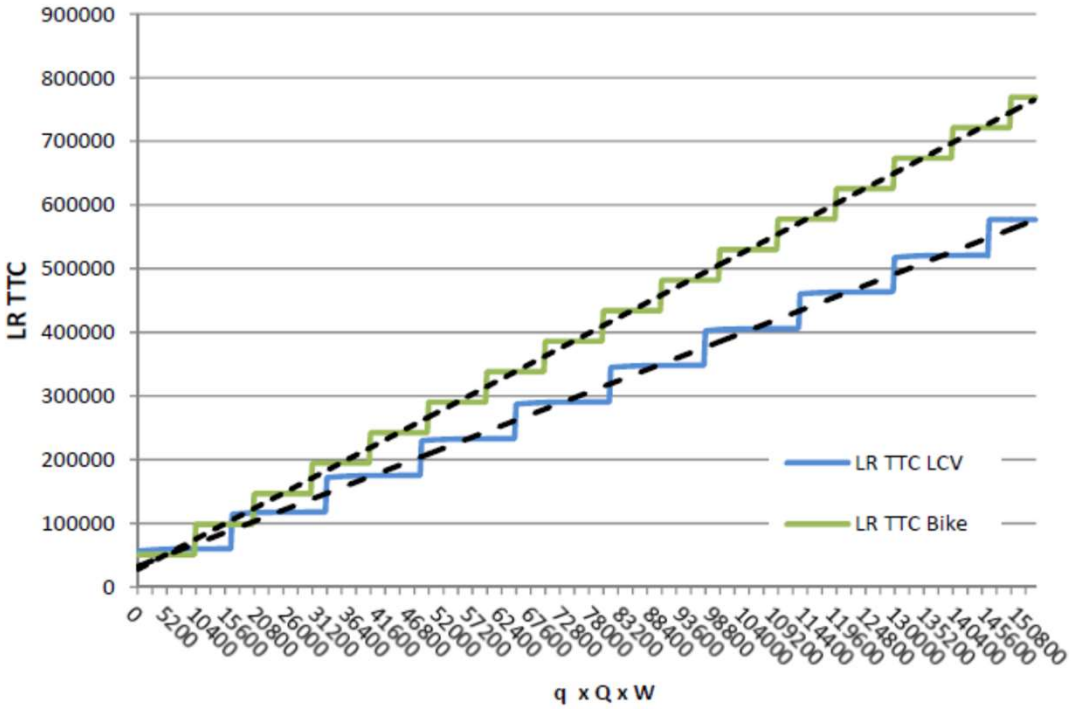
Goederen- en personenvervoer

Urban logistics (4)

- **Cycling messengers**



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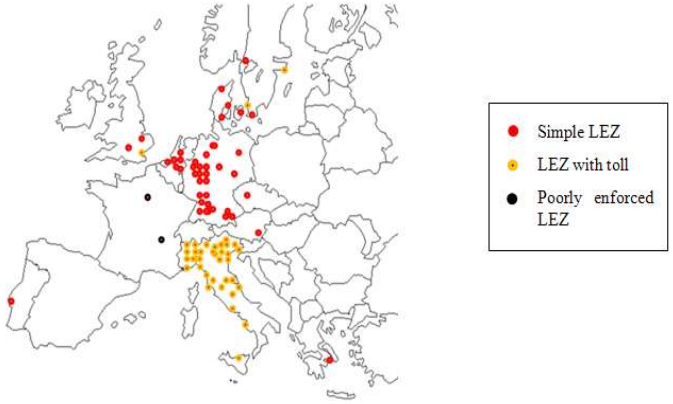
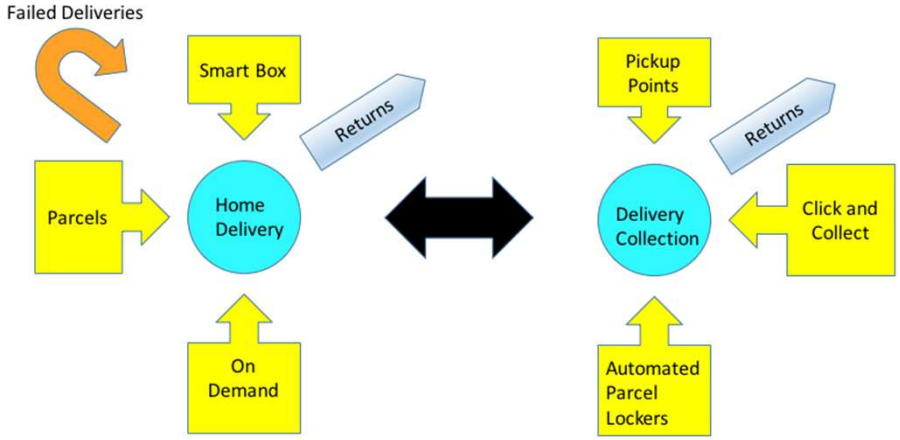
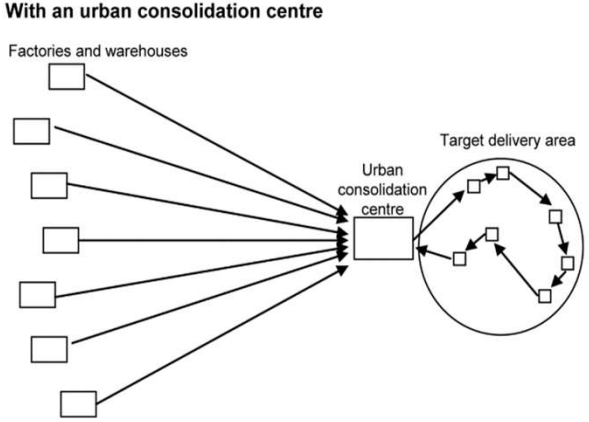
Goederen- en personenvervoer

Urban logistics (5)

- **Urban logistics guidelines**







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European Commission

Flanders
State of the art

Belgian Science Policy Office
belspo

Urban logistics (6)

- **Spatial characteristics in urban goods distribution**

- **Time windows**
- **Urban waterway delivery**

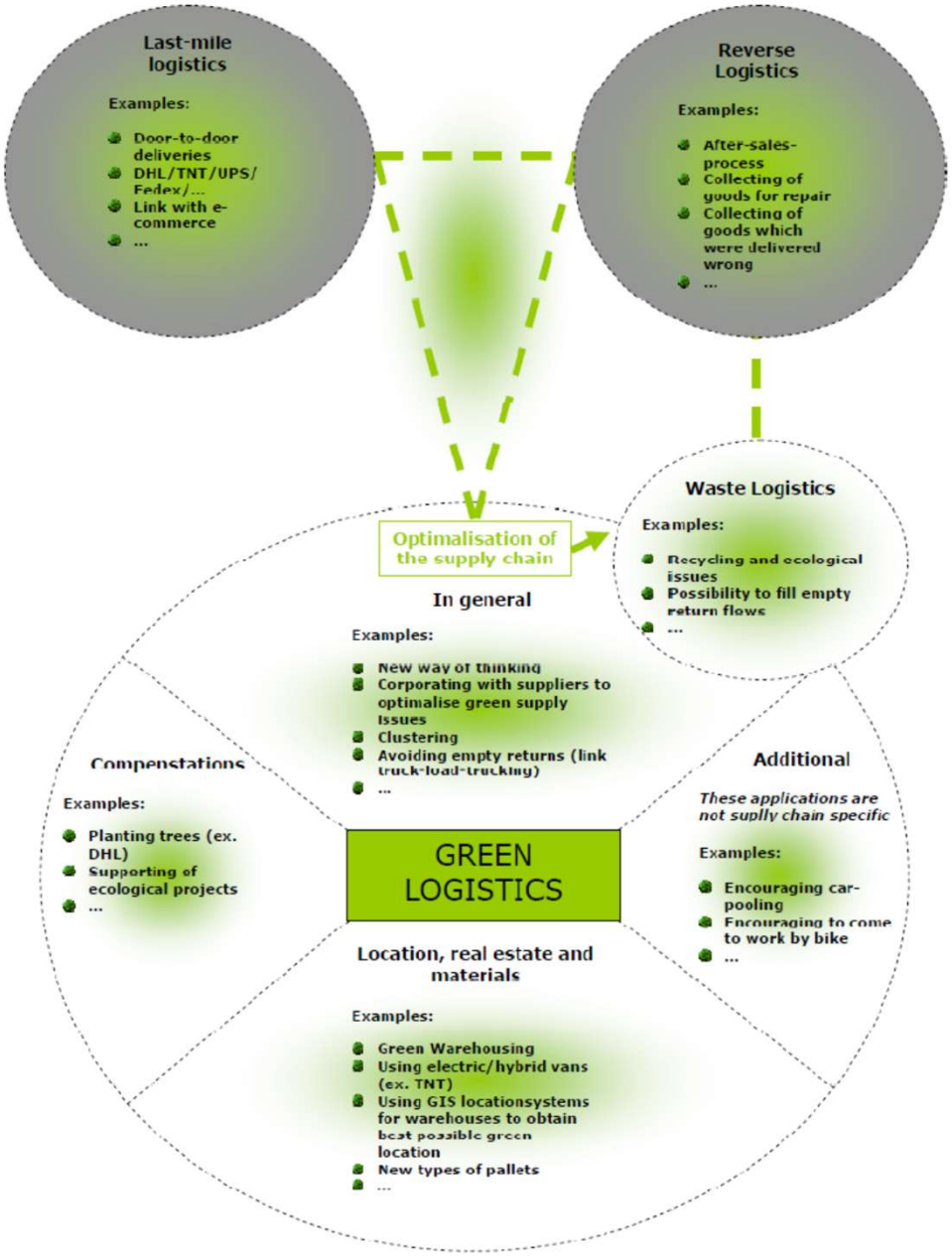
Innovation

- Innovation in logistics
- Innovation in surface transport

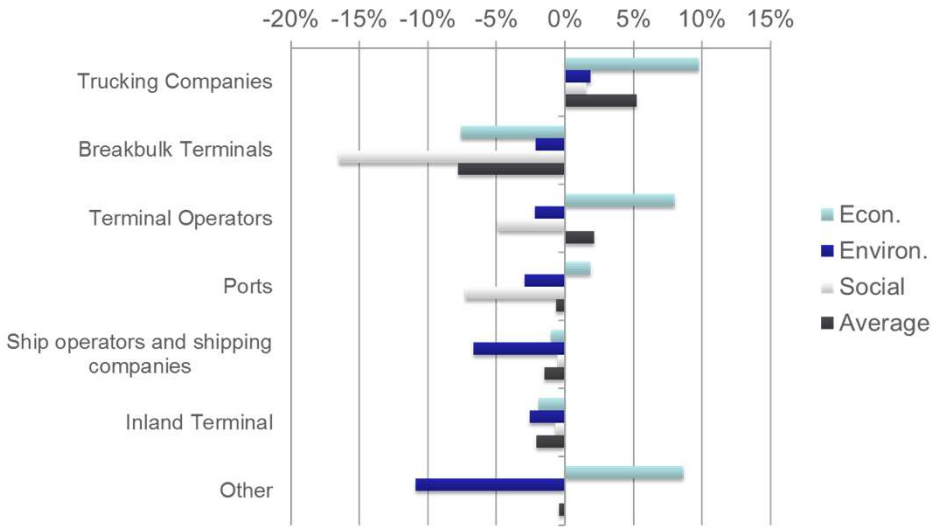
InnoSuTra
Innovation Processes in Surface Transport

- Market uptake of innovation

market up



Innovation benchmarking

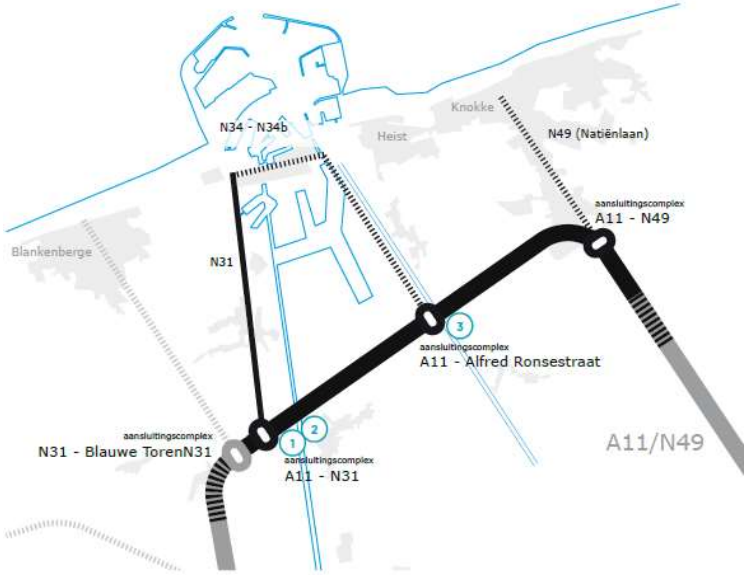


Decision rule	I<0 indicate that innovations are **successful** in tackling objectives of **little importance**	I = 0 indicates that innovations are **successful** in tackling important objectives	I>0 indicates that innovations are **unsuccessful** in tackling **important** objectives

	Econ.	Environ.	Social	Average
All companies	3%	-4%	-4%	-1%
Terminal Operator (DP World)	8%	-2%	-5%	2%

Cost/benefit analysis

- A11



Flanders
State of the art

- Iron Rhine
- Blauwe Kei
- High-speed rail line Paris-Amsterdam

nv De Scheepvaart
de kracht van de waterweg

EUROPEAN
COURT OF AUDITORS

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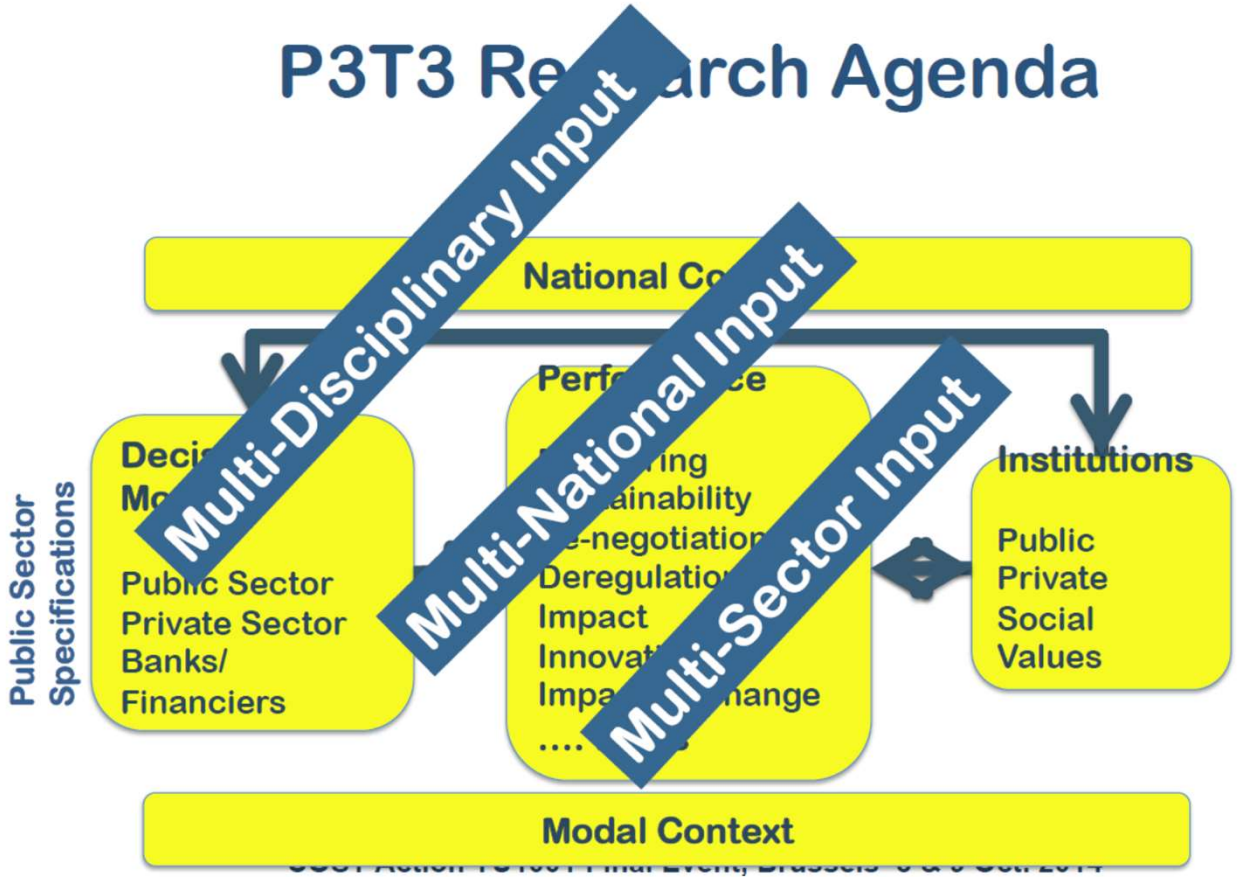
Project evaluation

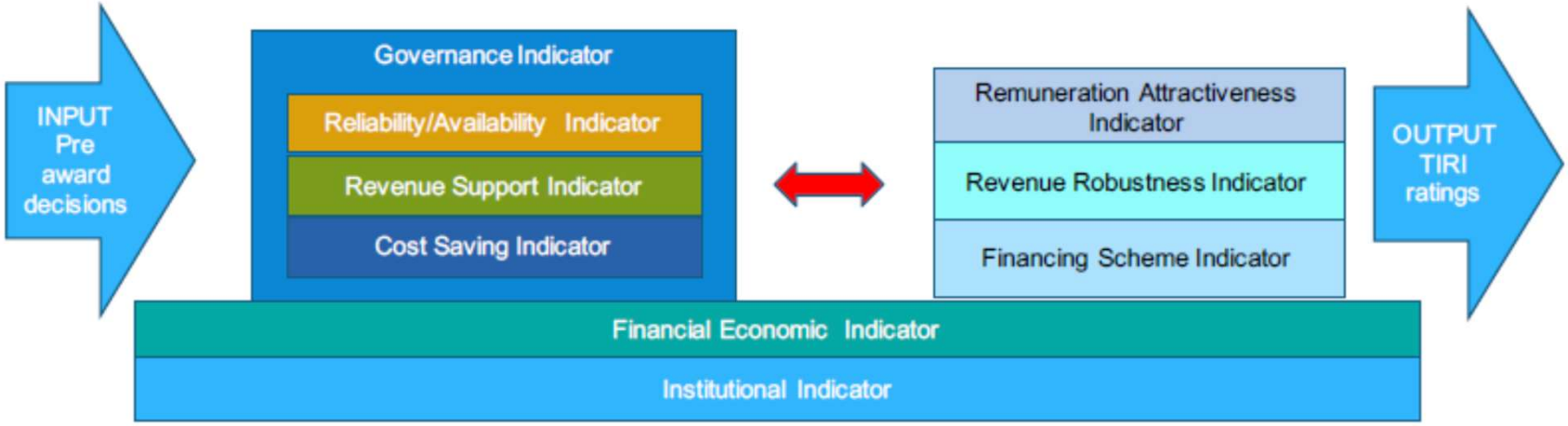
Public-private Partnerships in Transport



Project evaluation (2)

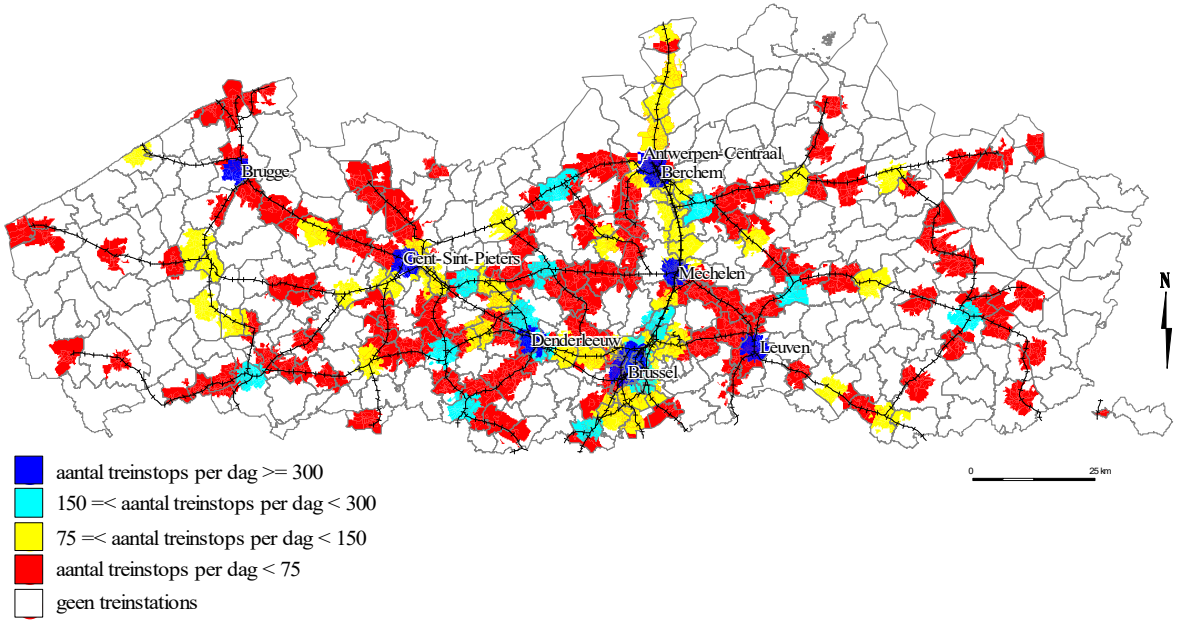
BENEFIT 4 TRANSPORT

Rating	Description
A	Very high likelihood of achievement of outcome
B	Average likelihood of achievement of outcome
B_{EX}	A rating describing a fairly robust internal project structure but subject to exogenous vulnerability
B_{EN}	A rating describing a project implemented under largely positive exogenous conditions but with internal structure vulnerabilities.
C	Low likelihood of reaching of achievement of outcome



Person mobility

- Mobility budget
- Park + Ride
- Job place modal split
- Crowd management
- Food deserts
- Impact of location on mobility



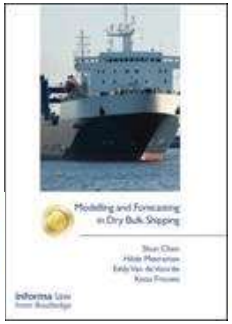
Cartografie: UA - Departement Transport en Ruimtelijke Economie
Bron: NMBS, 2005

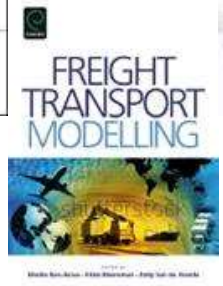
Regional-economic

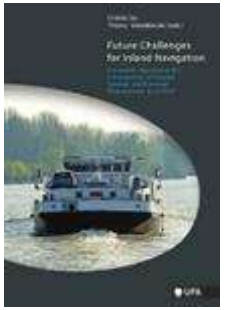
- Relation port-city
- City development and redevelopment
- Strategic planning of spatial projects
- Real estate choices
- Key future activity sectors
- Venture capital: a geographical perspective

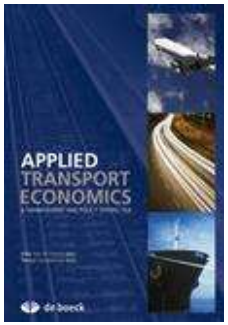
Provincie Antwerpen

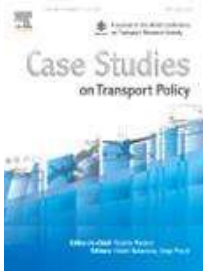
SCIENTIFIC OUTPUT

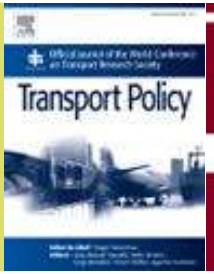


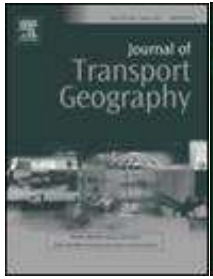












POLICY-RELATED OUTPUT

Piek

TPR in detail

- Staff
- Education
- Research
- International network

TransportNET
The University Network for Transport Education & Research

- **co-operation agreement between 7 European transport universities**

Université Lumière Lyon 2
KIT Karlsruher Institut für Technologie
Università di Genova
TU Delft Delft University of Technology
IST TÉCNICO LISBOA
UNIVERSITY OF THE AEGEAN

- **Education & research**
  - Exchange Programmes for Students;
  - Setting up of Summer Courses and Master Classes;
  - Setting up Training Programmes for teaching in Postgraduates Programmes;
  - Co-operation in Research Programmes
  - Extend advice and training on transport education and research
  - Providing on demand tailormade inhouse training for companies

Miscellaneous international network

External conferences

ETC

WCTR

IAME

ATRS

NECTAR

TRB

TRA

Own conferences

- Port and Maritime Economics & Policy SIGA2 conference
- Air Transport Conference
- BNP Paribas Fortis Port Co.Innovation Cafés
- Dennie Lockefeer chair events

MORE INFORMATION

- **http://www.uantwerp.be/tpr**

- **http://www.transportnet.org**

- **http://www.c-mat.be**