

Better winter road weather information saves money, time, lives and environment

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Bio of Pekka

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|--------------------------------------|--|
| Principal Scientist | VTT Technical Research Centre of Finland |
| Vice-President | Jaakko Pöyry Group subsidiary JP-Transplan |
| Corporate Analyst | Finnish Railways (VR Group) |
| Road Policy Engineer, R&D Manager | Finnish Road Administration S-E district |
| Cost engineer | Finnmap Ltd. |

Adjunct professor, University of Oulu, dept. of industrial engineering and management, *business and investment analysis in transportation*

Adjunct professor, Technical University of Tampere, dept. of logistics and business information management, *transport and logistics*

VTT in brief

Customer sectors

- Biotechnology, pharmaceutical and food industries
- Electronics
- Energy
- ICT
- Real estate and construction
- Machines and vehicles
- Services and logistics
- Forest industry
- Process industry and environment

Personnel 2700 ■ Turnover 245 M€

Focus areas of research

- Applied materials
- Bio- and chemical processes
- Energy
- Information and communication technologies
- Industrial systems management
- Microtechnologies and electronics
- Technology in the community
- Business research



VTT's operations

Research and Development ■ Strategic Research ■ Business Solutions
■ Ventures ■ Expert Services ■ Corporate Services

VTT on the map



Outline

- Background
- Method & goals
- The “market”
- The “goodness” measurement
- The research review map
- Observations & conclusions

Background

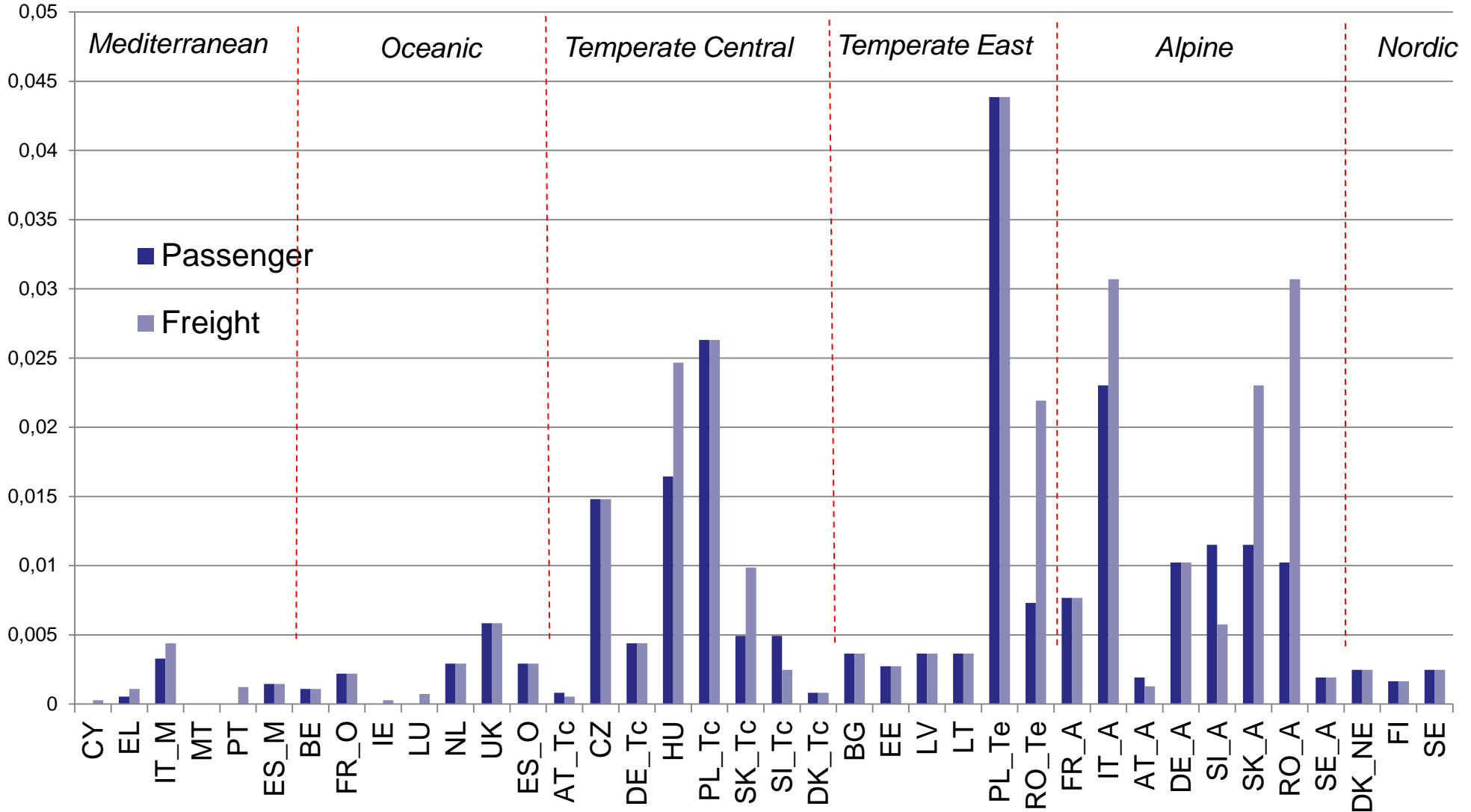
- Adverse winter weather conditions cause loss of life, well-being and material property
- Weather information services can mitigate these losses
 - Free publicly available forecasts and warnings
 - Tailored services
 - 24/7 road weather centres
 - Decision Support Systems (DSS)
 - Assist decision makers and maintenance operators
- Weather information services can improve efficiency
 - Optimising the use of materials (e.g. salt)
 - Better utilisation of personnel
 - More rapid response to changing conditions

Approach

- Benefits of winter road weather information in road transport
- Literature review of existing research results starting from the year 2000
- Segmentation of positive impacts by user groups and types of benefits
- Goals:
 - To identify what benefits have been studied the most and where more research might be needed
 - Where are the biggest benefits found?
- Result: a summary framework of identified benefits

The “market”

Extreme weather accident risk indicators for EU-27 road system



| | Present costs due to extreme weather, including all phenomena (ca. 2010) | | | | |
|----------------------|--|---------------|----------------|---------------|---------------------|
| | Accidents | Time costs | Infrastructure | | Freight & logistics |
| | | | Physical infra | Maintenance | |
| Road | >10 bill. | 0.5-1.0 bill. | ca. 1 bill. | ca. 0.2 bill. | 1 – 6 bill. |
| Rail | >0.1 bill. | >10 mill. | | >0.1 bill. | 5 – 24 mill. |
| IWT | ca. 2 mill. | na | na | na | 0.1 - 0.3 mill. |
| Short sea | >10 mill. | na | na | na | 0.2 - 1 mill. |
| Aviation | na | >0.6 bill. | na | na | 0.5 – 2.3 mill. |
| Light traffic | >2 bill. | - | na | na | - |
| TOTAL | >12 bill. | >1 bill. | ca. 1 bill. | >0.3 bill. | 1-6 bill. |

The EU-27 grand total more than 15 bill. €p.a.

Method to evaluate the "goodness" of the system

**Public good /
socio-economic
CBA**

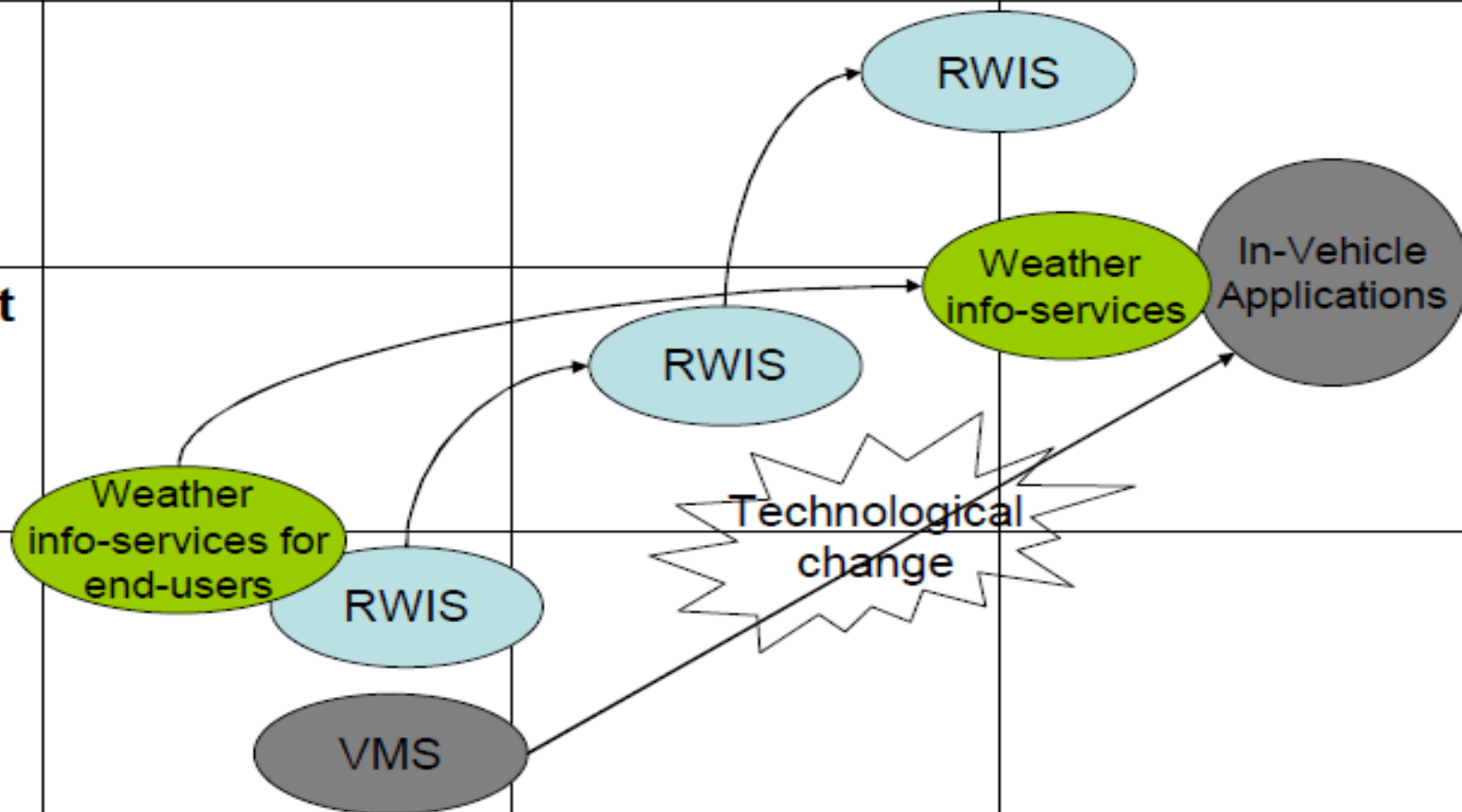
**PPPs /
CBA + CFA**

**Private good /
CFA**

Future

Present

Past



| | | Function | | | | Societal benefits | | |
|---|-----------------------------|-----------------|--------------------|----------------------|--------------------|--------------------------|--------------------|-----------------------------|
| User groups | | <i>Road use</i> | <i>Road maint.</i> | <i>Traffic mgmt.</i> | <i>Asset mgmt.</i> | <i>Safety</i> | <i>Environment</i> | <i>Economy (saved time)</i> |
| Road users | Private drivers & travelers | 5 | | | | 5 | 2 | 3 |
| | Pedestrians & bicyclists | 1 | | | | | | |
| | Professional drivers | 2 | | | | | | |
| Fleet managers | Passenger | | | | | | | |
| | Freight | | | | | | | |
| | Maintenance | | | | 1 | | | |
| | Emergency services | 1 | | | | | | |
| Infrastructure service providers | Maintenance contractors | | 5 | | | | | |
| Authorities | Road authority | | | | | | | |

Observations

- The “market” is changing from *socio-economics* to *business economics*?
- There can be a shift from safety to reliability? From *traffic* to *logistics*?
- Some “holes” in the recent research coverage



Conclusions

- Summary framework on weather information impacts:
 - Safety impacts have been studied and identified extensively
 - Studies on benefits to fleet management and logistics are **lacking**
 - Studies on benefits to pedestrians and bicyclists are **few**
- Across the board, qualitative studies outnumber quantitative studies



VTT - 70 years of technology

Thank you!