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Laboratoire d'Economie des Transports
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Europeanizing Transport Security

Policy and Research Recommendations

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ECTRI
European Conference of Transport Research Institutes

FERSI
Road Safety Research

Overview

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3. **Policy and Research recommendations**
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1. Introduction

Transport Security and the EU

- **Integration** and **interdependence** of transport routes in Europe (Trans-European Networks of Transport) → Intermodal challenges
- **Growth** in
  - trade and total goods transport activities → 3.632 billion tons kilometer for intra-European transport
  - **Traffic** between MS expected to **double** by 2020
- **Expanding risk landscape** → terrorism, criminal activities and extreme weather

Challenges

- Remove **bottlenecks**
- Ease **intermodal** operations
- **Strengthen**…
  - **robustness** of key infrastructure
  - **Resilience** of transport system as a whole

Investment Decisions
(Trade-off)

2. The Protection of Transport

Policy Framework – Security of Critical Infrastructure

EU

- **EU Security Strategy** (2003)
- **Internal Security Strategy** for the EU Towards a European Security Model (2010)
- **EPCIP** Directive on the *Identification and Designation of European Critical Infrastructures* (2008)
- Commission Staff **Working Document on Transport Security** (2012)

National

- National Strategy for Critical Infrastructure Protection (KRITIS) – **Germany** (2006)
- Protecting Critical Infrastructure – **Netherlands** (2005)
- National Strategy for Critical Infrastructure – **Canada** (2009)
- Presidential Policy Directive on Critical Infrastructure Security and Resilience - **USA** (2013)

Threats to Transport (infrastructure)

Natural Hazards

- Earthquakes
- Extreme Weather affecting transport infrastructure and operation → flooding, storms, heat, precipitation, blizzards
- Consequences for EU transport system = **15 billion €** annually
- Impact on users = 10% of all accidents are rel. to weather

Man-made hazards

- Terrorism and criminal activities
- Transport system as
  - means (road pirating)
  - end (attack on infrastructure → symbolic value)
  - target (travelers, passengers)
- Major accidents
- Cyber attacks

Current Deficits and Obstructions

- **Practical limitations**:
  - **Uni-Modal** security approaches = no comparison between critical infrastructure of different modes
  - **Levels of security** between modes **differ**
  - Many and versatile ***security actors***
  - „absence of common approaches or standards throughout the EU“ (EC Working Paper on Transport Security)

Current Deficits and Obstructions II

- **Political limitations**:
  - Security policy is a **national prerogative** → no transfer of competencies to European institutions
  - **Lack of operative implementation** of standards
    - Methodologies/procedures to identify critical infrastructure (→ EPCIP)
    - Technologies

Special Focus on Land Transport

- „**Open**“ system
- *Advisory Group on Land Transport Security (EC)*
- 60% intra-EU freight transport by **inland transport modes**, 47% by **road** alone
- „underdeveloped“ modes (security perspective)

Aspects of Land Transport Security

- **Critical infrastructure**
  - tunnels, bridges, seaports, airports, etc.
- **Detection and surveillance**
  - Hazardous goods, monitoring (persons, freight)
- **ICT technology**
  - Telematics, car-to-x, in-vehicle systems,
  - traffic control centre, decision support







3. Policy and research recommendations

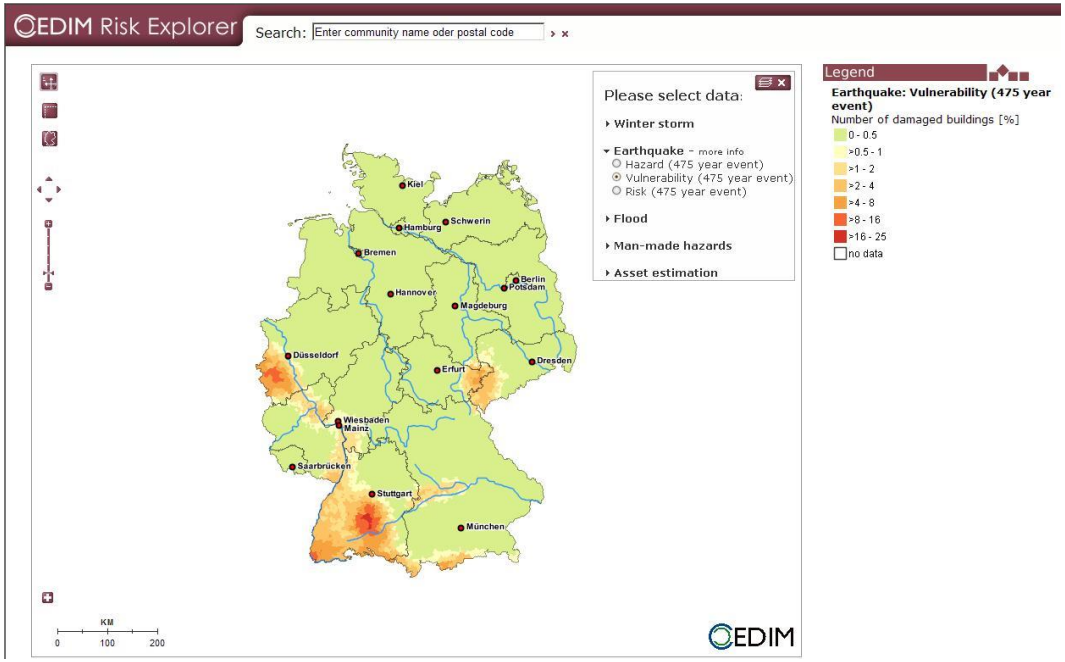
Concept of Resilience

- What is a **resilient transport system**?
  - A system „that bounces back faster after stress, enduring greater stresses, and being disturbed less by a given amount of stress“ (WEF 2013: 37)
    - ***Robustness***: Ability to absorb disturbances
    - ***Redundancy*****:** Excess capacity which enable a core functionality
    - ***Resourcefulness****:* Ability to adapt to crises, respond flexibly
    - ***Response***: Ability to mobilize quickly
    - ***Recovery***: Ability to regain a degree of normality

Background

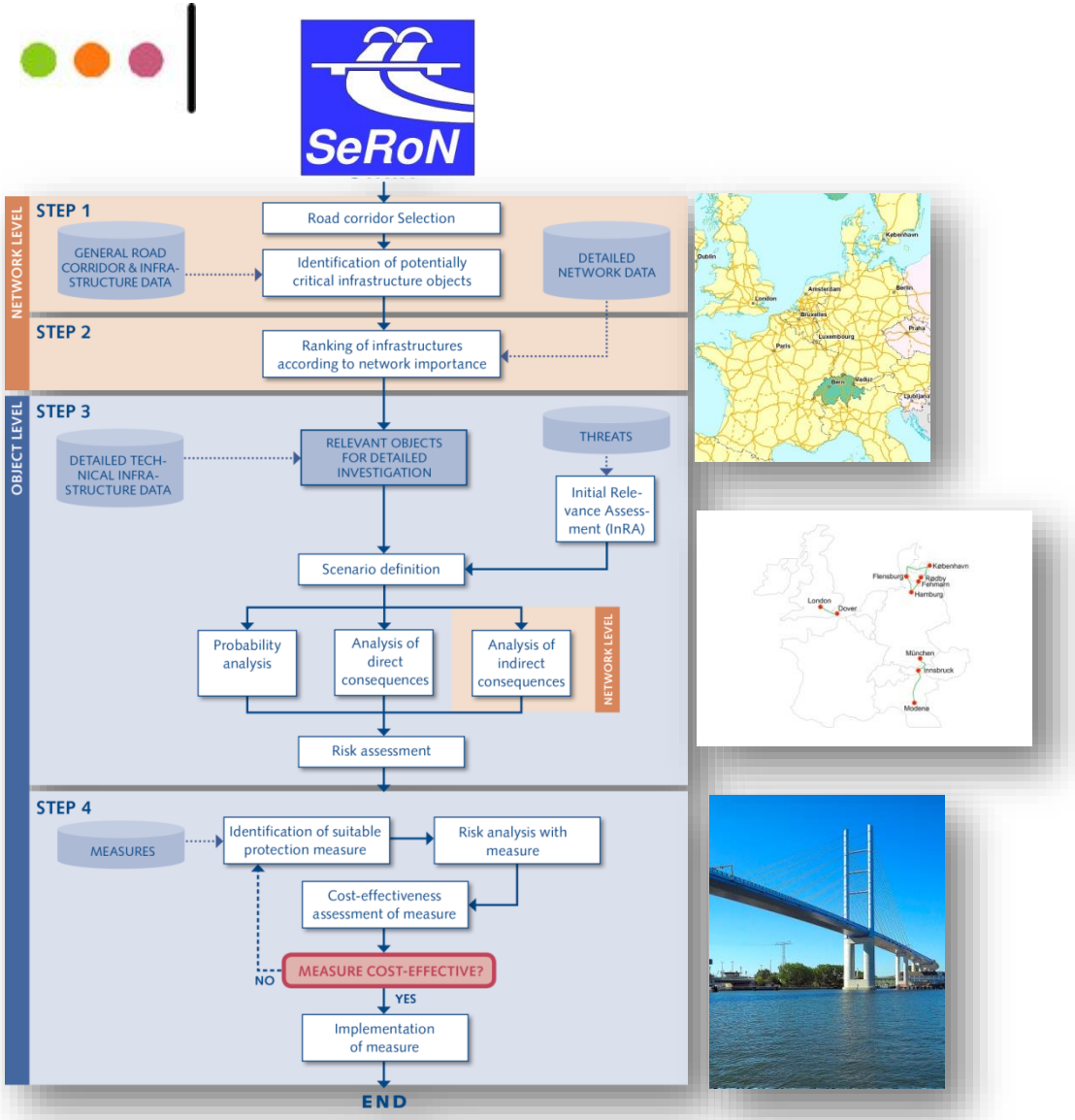
- **Identification procedures** for critical infrastructure (SKRIBT, SKRIBT+, SeRoN)
- Identification and **Selection Procedures** for protection measures (bridges and tunnels) (SeRoN, SKRIBT, SKRIBT+)
- **Risk Management** Processes for owners and operators (SecMan)
- Development of **sensor technology** for critical infrastructure (RETISS, ESIMAS, SKRIBT)
- Analysis of **human bevahiour** in case of emergencies (SKRIBT, SKRIBT+)

1) Development of common and European-wide applicable risk maps



Source: CEDIM, Karlsruhe Institute of Technology

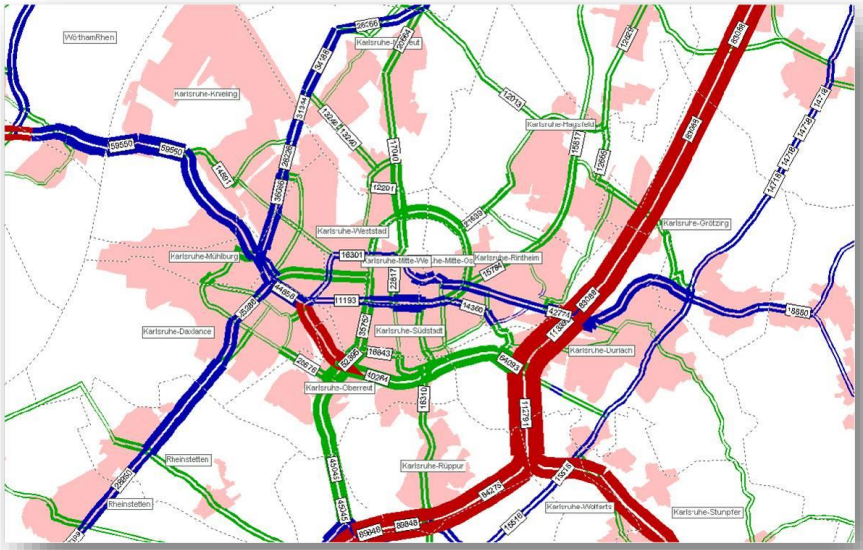
- Which hazards/threats are relevant for which parts of the transport system?
- EU MS have different perceptions on risks/threats
- Focus on European TEN-T network → « hot spots »
- Direct investment decisions into protection measures



Source: www.seron-project.eu

2) Develop and implement a common procedure to identify critical transport infrastructure

- What are **vulnerable infrastructure assets** within the TEN-T network → tunnels, bridges, seaports, airports, embankments, etc….and
- Which of them are **critical** for the transport **network**?
- **General aim**: Commonly used procedure which allows identifying and assessing critical transport infrastructure…
  - from a *European perspective*
  - *across transport modes*
  - with respect to *different hazard types*



Source: PTV Group (PTV Visum)
(http://www.viscotia.com/visum2)

3) Integrate security aspects in transport infrastructure planning (for TEN-T routes)

- Investigate **redundancy** of infrastructure assets
- **In-built security** design → FEMA
- Pre-investigate potential loss of assets and possibilities for **de-routing** → traffic simulation
- Include socio-economic consequences
- Macroscopic transportation planning
- Microscopic traffic simulation

SECMAN

Security Risk Management Processes for Road Infrastructures

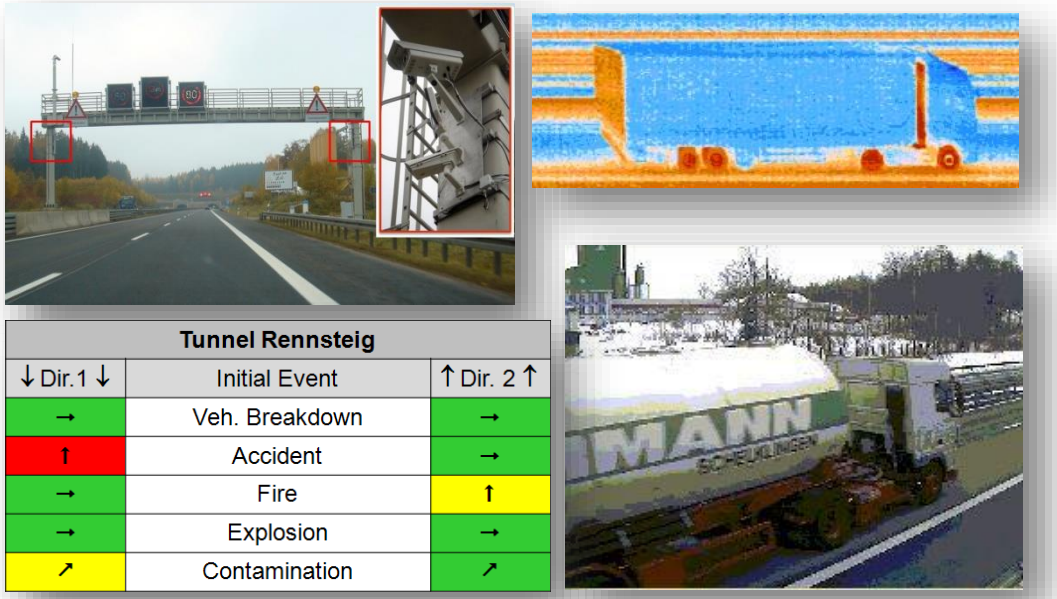


Source: www.piarc.org

4) Develop more practicable solutions in form of handbooks and manuals

- « Building up resources means building up the capacity for self-organization » (WEF 2013: 39)
- **End-users**: owners and operators
- **Best practices** for the **analysis** and **assessment of risks** for particular infrastructure objects
- Knowledge about **available methodologies** and **protection measures**
- Bottom-up process for improving security

RETISS



Tunnel Rennsteig		
↓ Dir.1 ↓	Initial Event	↑ Dir. 2 ↑
→	Veh. Breakdown	→
↑	Accident	→
→	Fire	↑
→	Explosion	→
↗	Contamination	↗

Source: RETISS project (www.retiss.de)

5) Develop real-time security solutions/ detection systems

- Improving **response** capabilities
- Ability to build up technical, organizational and operational mechanisms for **real-time monitoring** and **emergency management**
- Integration and data fusion → various detection systems
  - Infrared scanning
  - Fire detection
  - Sensor technology for monitoring infrastructure
  - GIS systems – satellite data
- **Visualization** and **communication** (social media, floating phone and car data)
- **Real-time routing**

4. Conclusions

Conclusions

- **European security approach** is needed (standardized tools and methodologies)
- **Top down** and **bottom-up** processes should interact
- **Resilience dimensions** need to be addressed
  - **Robust** infrastructure
  - **Redundant** networks
  - **Resourcefulness** owners/operators
  - **Response** and **recovery** capabilities