



Hrvatsko asfaltno društvo



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Pametno gospodarenje cestovnom infrastrukturom

Smart Management of Road Infrastructure

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International seminar ASPHALT PAVEMENTS 2017**

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- 1. The importance of the transport sector in Europe**
- 2. The European Road Network**
- 3. European and National Road Infrastructure financing sources**
- 4. Trends and Challenges**
- 5. Consequences and threats**
- 6. Smart Management of the road infrastructure**



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1. The importance of transport in Europe

- **Major support of our socio-economic model (EC)**
- **Driver for economic growth and job creation (EC)**
- **Fosters mobility, trade and exchange (EC)**
- **Essential role of the road in the global transport framework:**
 - **Accessibility (all users, 24/7)**
 - **Mobility**
 - **Economic development**



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2. The European Road Network

Facts and figures



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- **Length of the road network:**
 - Europe = over 5 million km
 - Croatia = some 27000 km

- **Contribution of the road sector to the economy:**
 - Direct: 5 million jobs or +/- 5% of the EU GDP *
 - Indirect: 14 million jobs or +/- 11% of the EU GDP **

- **The major community asset:**
 - Reconstruction value > 8.000 billion € ***

* Source EC

** Source: ERTRAC

*** ERF estimation



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2.8 Transport network

Comparison between EU 28, USA, Japan, Russia and China, 2012 (thousand km)

Source: EC, IRF

	EU 28	USA ⁽¹⁾	Japan ⁽²⁾	China	Russia
Road network (paved)	5,000	4,258	983	3,610	1,038
Motorway network	73.2	92.0	8.1	96.2	50.9
Railway network	2,153.0	205.5	20.1	97.6	85.6

(1): **Japan**: data on the railway network and on the electrified rail lines are of 2010 and referred to Japan Railways only.

(2): Divided highways with 4 or more lanes (rural or urban interstate, freeways, expressways, arterial and collector) with full access control by the authorities.

(3): **Japan**: national expressways.

(4): **Russia**: federal roads.

(5): **USA**: a sum of partly overlapping networks.

- **Motorways = +/- 1,46 %**
- **Remaining roads (trunk, national, regional, local, urban & rural roads) = 98,54 %**



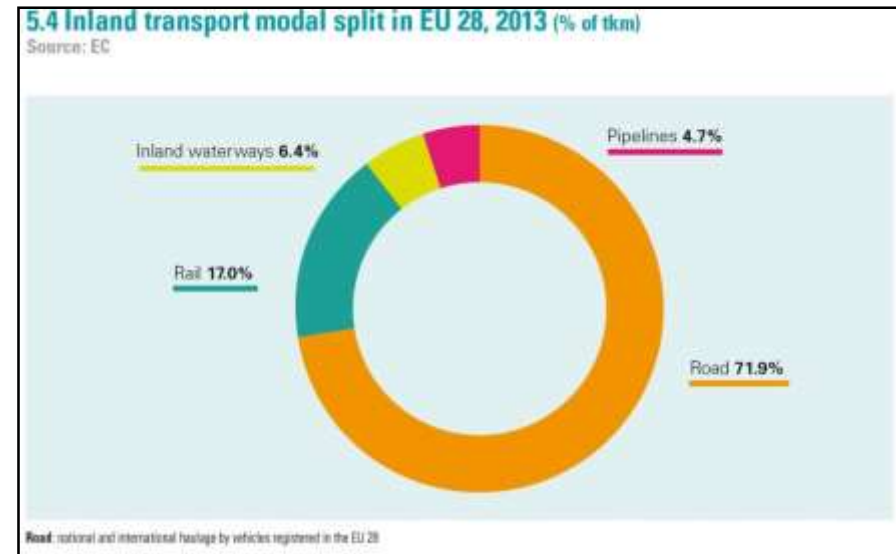
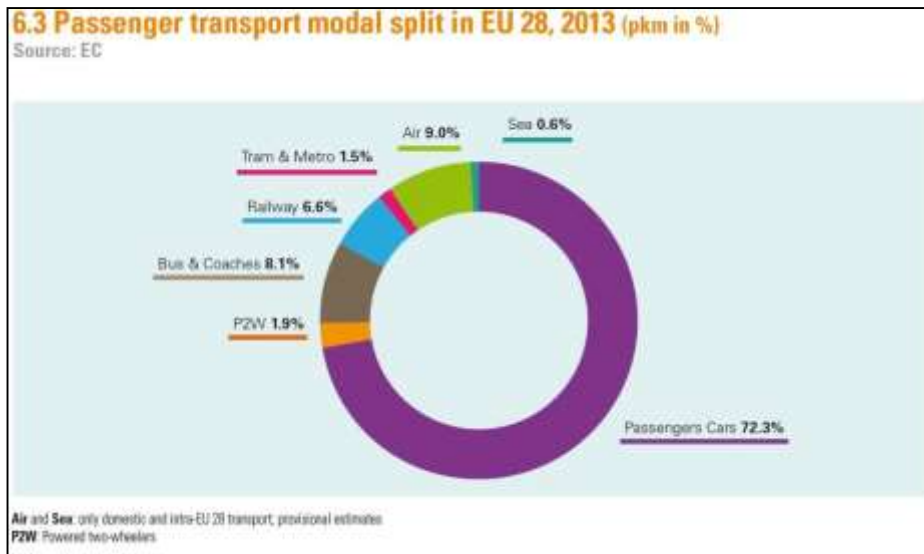
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Roads are the backbone of the economy

82,3% of EU inland passenger transport

71,9% of EU inland freight transport





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The Trans-European core and comprehensive transport networks





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The Trans-European core and comprehensive road transport networks

- **TEN-T core road network = 56,630 km – 1,13 % of the whole road network**
- **TEN-T comprehensive road network = 136,700 km – 2,73 % of the whole road network**
- **97,3% of the EU road network are not part of the TEN-T**



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3. European and National Road Infrastructure Financing Sources



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Road Infrastructure Financing Sources

➤ European:

- European Funds (cohesion, regional development)
- EIB Loans and Guarantees
- Financing tools (CEF, EFSI, Project Bonds)

➤ National:

- Taxes (excises, registration...)
- Tolling (motorways, specific infrastructures, e.g. bridges or tunnels)
- Road User Charging Schemes (time based, distance based)



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4. Trends and Challenges



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Financing the transport infrastructure

➤ **All modes of transport:**

- **Lowest level since the 70's**
- **1,5% of the GDP in the 70's**
- **0,8% of the GDP between 2000 and 2008**
- **Similar trend after the financial crisis**



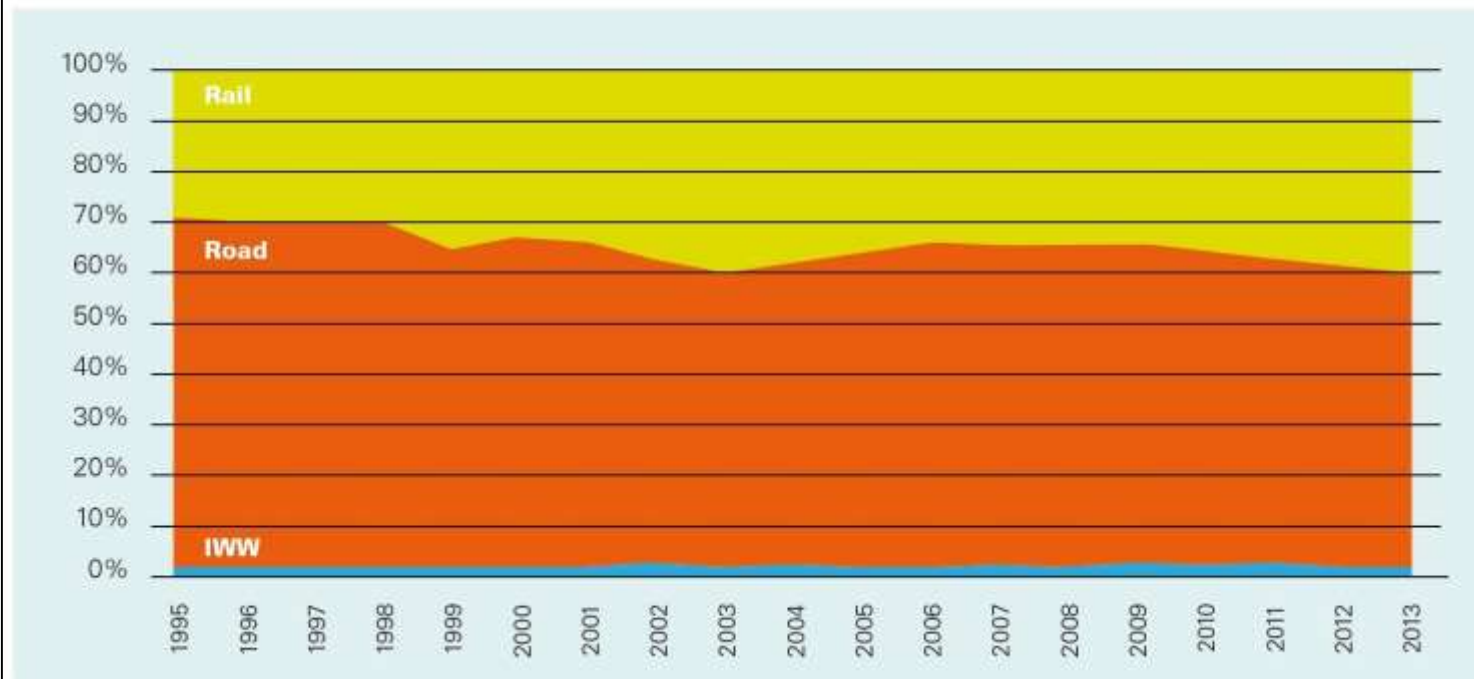
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Financing the transport infrastructure

4.4. Distribution of infrastructure investment between modes in EU 28, 1995-2013 (€, current prices, current exchange rates)

Source: ITF



Note: No data for Cyprus

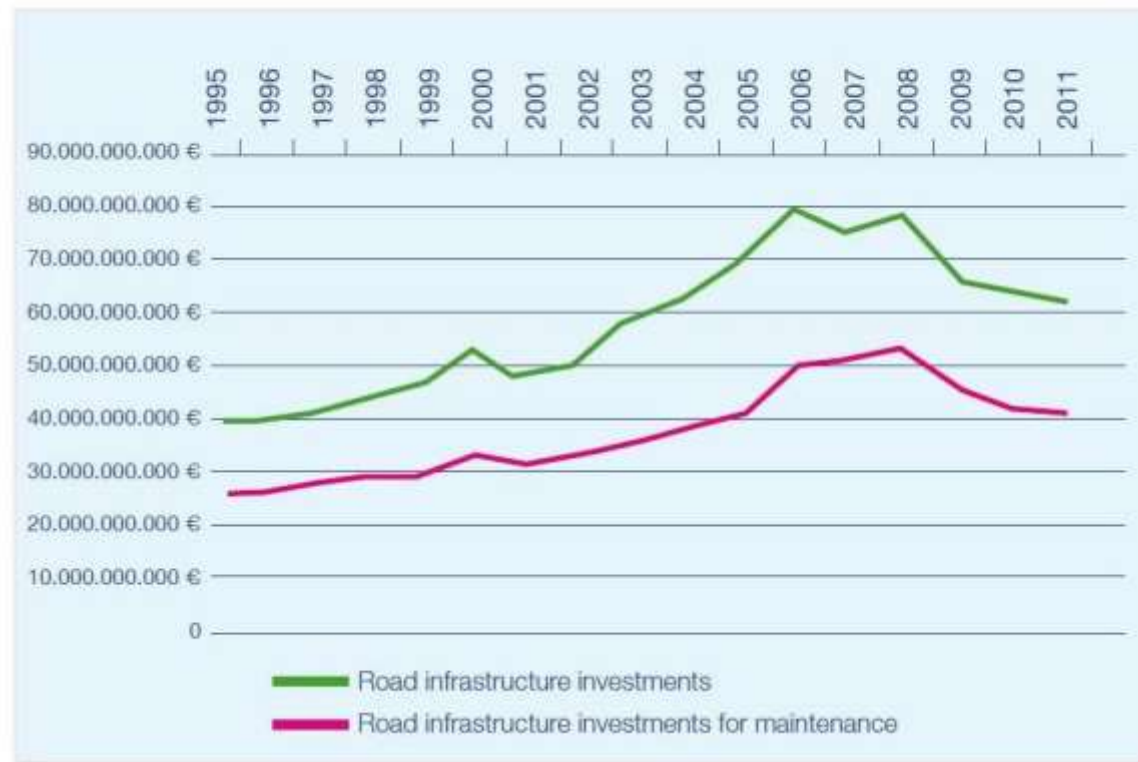


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Road Infrastructure Financing

Evolution of Road Infrastructure Investments and Road Maintenance Investments in a selection of Western European Countries*

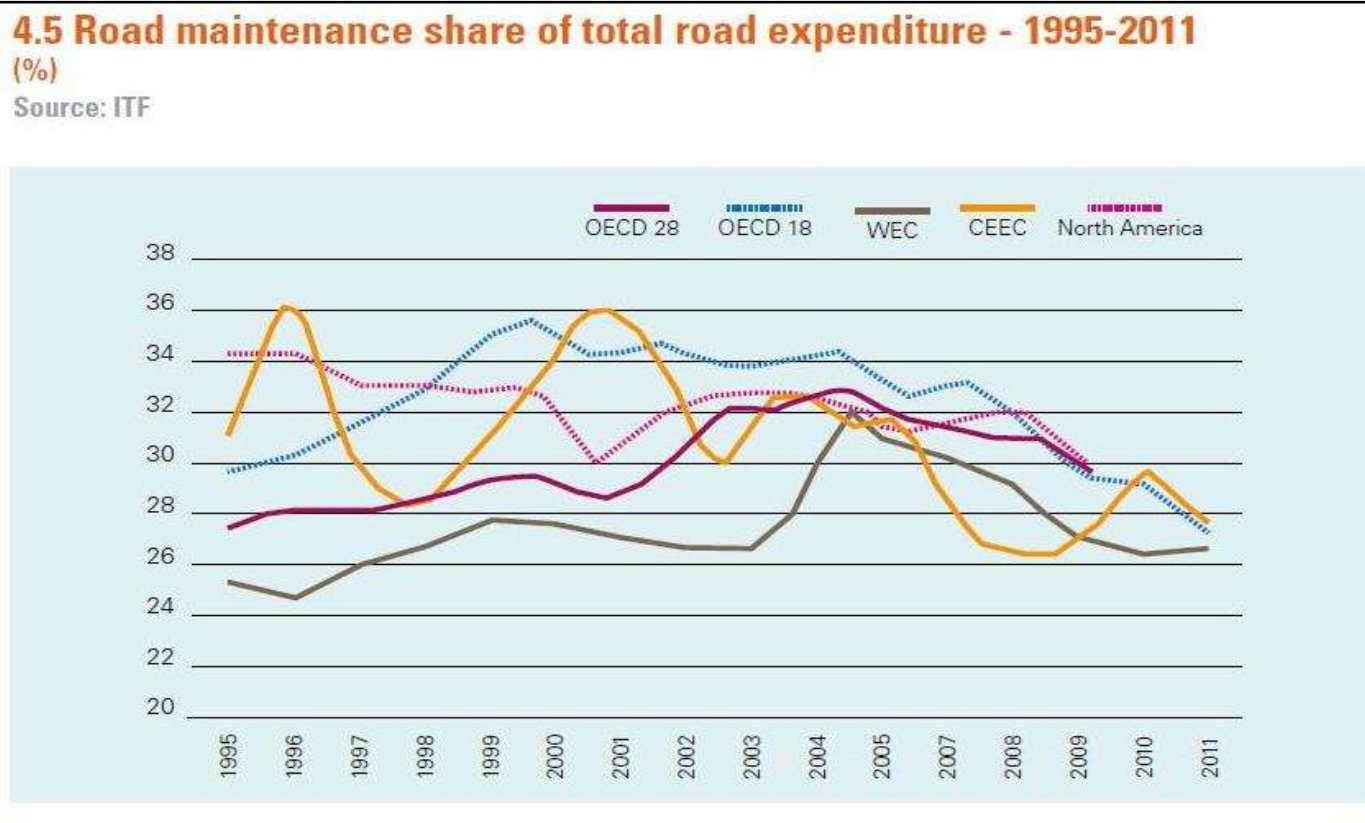




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Trends and evolution in road maintenance expenditures

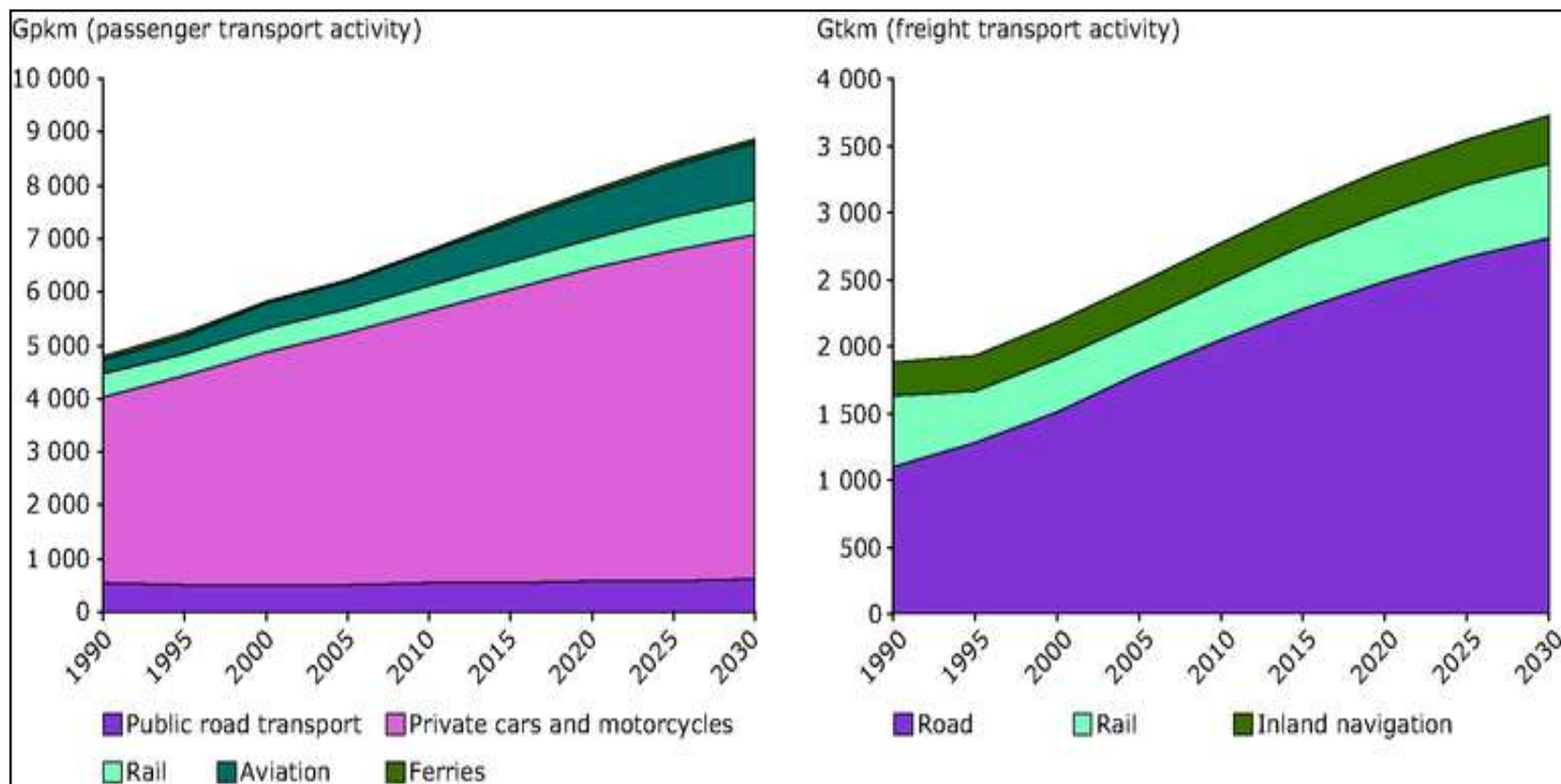




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Trends in road transport





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5. Consequences and threats



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Consequences of the backlog in road maintenance (1)

➤ Impact on the economy

- Loss of value
- Reduced mobility



➤ Impact on Road Safety

- Degradation
- Risks of accidents and dangerous situations



➤ Impact on the environment

- Traffic jams, congestion
- Increased emissions





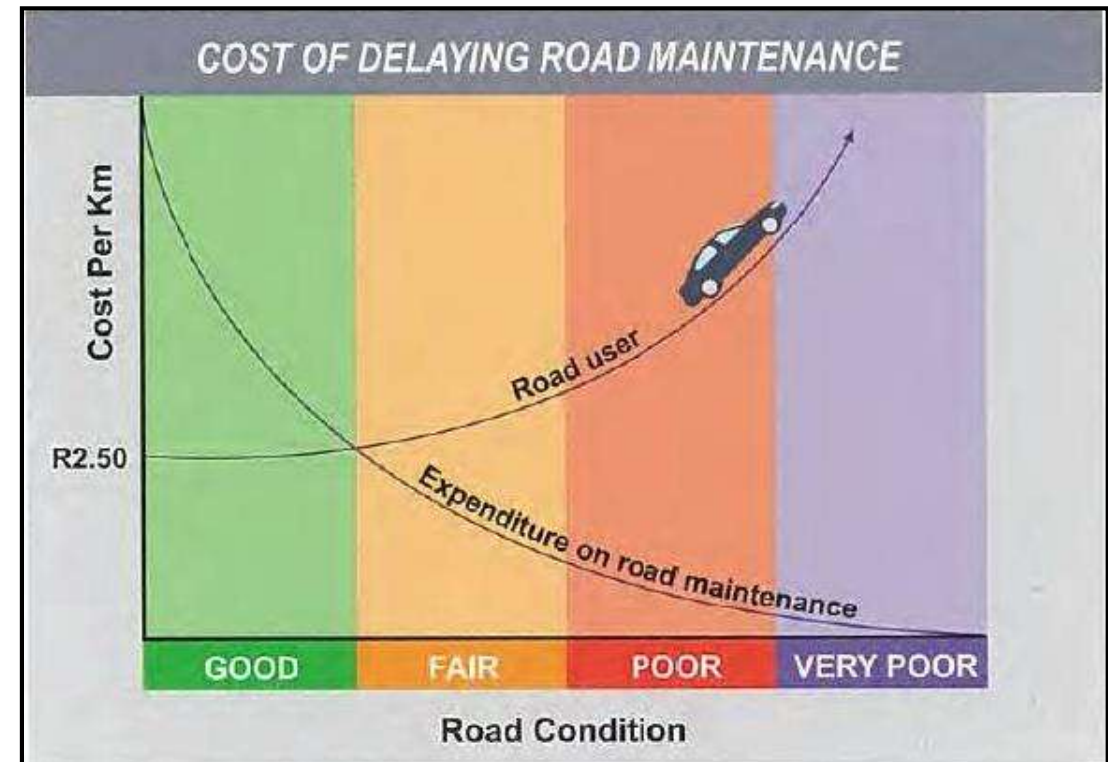
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Consequences of the backlog in road maintenance (2)

Management costs for the road owners and usage costs for road users





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German example: Leverkusen Bridge (A1)

- Very dense industrial area (chemical industry)
- Important traffic (high percentage of HGVs)
- Ageing structure – maintenance backlog
- Closed to traffic > 3,5 T from Dec. 2012 to March 2013
 - Estimated social cost (loss of time, additional fuel consumption, delays...):
80 million €
- Closed again to heavy traffic from June 2014, until...?





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Italian example: Lecco and Ancona

➤ Lecco bridge collapse (October 2016):

- 1 dead
- 5 injured



➤ Ancona bridge collapse (March 2017):

- 2 deaths
- 3 injured





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6. Smart Management of the Road Infrastructure



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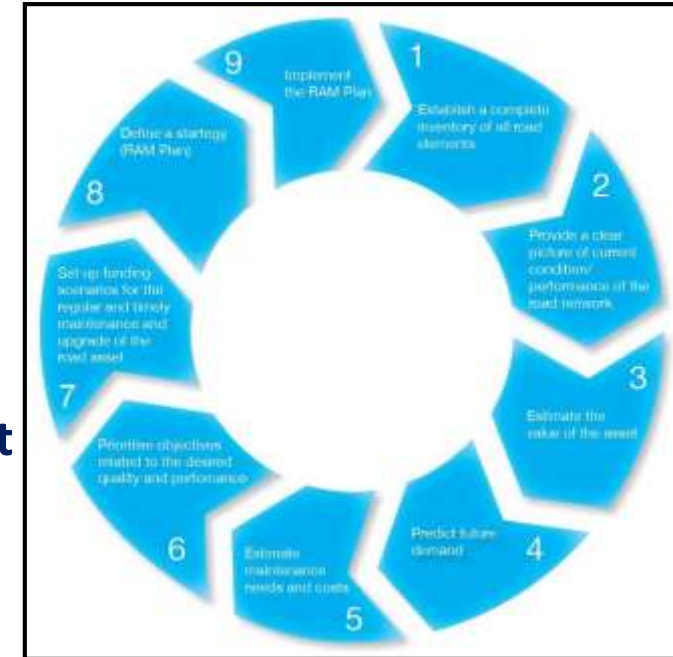


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New approaches

➤ The Road Asset Management Approach

- Consider the road as an asset
- Knowledge of the value and the current condition of the asset
- Regular financial and technical evaluation
- Use of key performance indicators
- Level of service
- Long-term perspective
- Through the whole life cycle (construction, operation, maintenance)
- Adaptation, improvement and upgrade
- Better strategy and decision making tools
- Pluriannual financing programmes
- Incorporate future evolution (climate resilience, traffic, new vehicles, new mobility patterns, new usages...)





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New opportunities (1)

➤ **Research / Development / Innovation**

- **Lots of RD&I from the industry side**
 - ✓ **Materials (sourcing, recycling, disposal...)**
 - ✓ **Equipments (speed, performance...)**
 - ✓ **Processes (technologies, additives, resilience...)**
 - ✓ **Assessment methods (GHG of CO₂ calculators, social responsibility...)**
 - ✓ **New vehicle technologies and road usages**

- **Encourage, support and coordinate actions for innovation and implementation**
 - ✓ **Legislative and regulatory framework (reinforced cooperation public/private)**
 - ✓ **Incentives for performance, long-term objectives**
 - ✓ **Innovative contracting and management methods**
 - ✓ **Optimisation of resources for maintenance and improvement**
 - ✓ **Incorporation of new technologies (e.g. ITS,...)**



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New opportunities (2)

- **Improved dialogue and cooperation between stakeholders**
 - **Better communication with road owners**
 - ✓ Platforms of exchange of knowledge
 - ✓ At all levels (European, national, regional, local)
 - ✓ Long-term vision (competitiveness)
 - ✓ Improved mobility
 - **Include the road users in the framework**
 - ✓ Better ownership on the citizen side
 - ✓ Social cohesion and improved integration of roads to all transport modes
 - ✓ Level of Service: 'Road as a Service'



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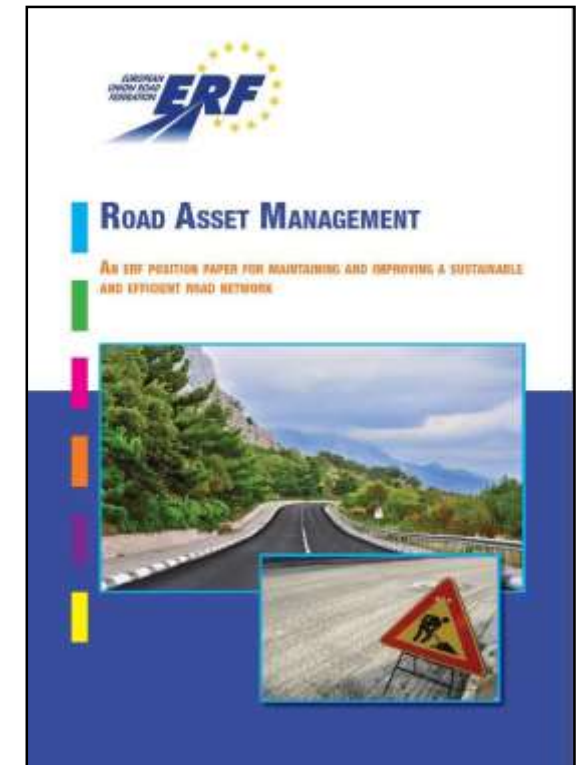
The ERF commitment

The ERF Manifesto on Road Asset Management



[http://www.erf.be/images/stories/Road Asset Management/Screen-ERF.pdf](http://www.erf.be/images/stories/Road_Asset_Management/Screen-ERF.pdf)

The ERF Position Paper on Road Asset Management



<http://erf.be/images/Road-Asset-Management-2014-07.pdf>



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The Voice of the European Road

Thank you for your attention

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