

# Making a Mark in Europe

**George Lee**

**Chairman**

**ERF Roadmarking Committee**



# Making a Mark in Europe

## About ERF

- Non-profit association established in 1998
- Represents road infrastructure sector
- More than 50 members
  - Road equipment manufacturers (barriers, markings, signs, ITS)
  - Construction companies
  - National Associations
- Specialist Working Group structure including road markings

## About RSMA

- Non-profit association established in 1976
- Represents road marking contractors, manufacturers and raw material suppliers
- Around 100 members, including some present today
  - Delivers specialist services to members – training, health & safety, environmental and quality management
  - Undertakes road marking surveys & lobbies government



# Making a Mark in Europe

## ERF Focus on Road Markings

- Supporting member involvement in product standardisation process
- Road Safety policy in the EU
- Supporting the case for investment
- Road Safety impact of Markings
- Role of Road Markings in improving safety and economic efficiency
- Future initiatives involving road markings

# Making a Mark in Europe

Supporting member involvement in product standardisation process

- Liaising with Commission on issues relating to standardisation process and CE marking
- Discussing in member fora issues surrounding difficulties in obtaining consensus on harmonisation of standards

# Making a Mark in Europe

## Road Safety policy in the EU

### Road fatalities and injuries in Europe

- a huge socio-economic problem
- 80 people still lose their lives every day on Europe's roads
- Estimate cost to EU economy: € 51 billion (ETSC: Willingness to Pay approach)
- [http://www.etsc.eu/documents/Methodological\\_Note\\_PINReport2011.pdf](http://www.etsc.eu/documents/Methodological_Note_PINReport2011.pdf)



# Making a Mark in Europe

## Road Safety policy in the EU

### Road injuries

- 250,000 seriously injured in 2012
- Estimated cost to EU economy: € 250 billion
- Source: 2012 European Commission Working Paper on Serious Injuries
- Definition: cost of medical treatment, loss of workforce, extra burden placed on insurance, legal and social support systems

➤ [http://ec.europa.eu/commission\\_2010-2014/kallas/headlines/news/2013/03/doc/swd\(2013\)94.pdf](http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2013/03/doc/swd(2013)94.pdf)

# Making a Mark in Europe

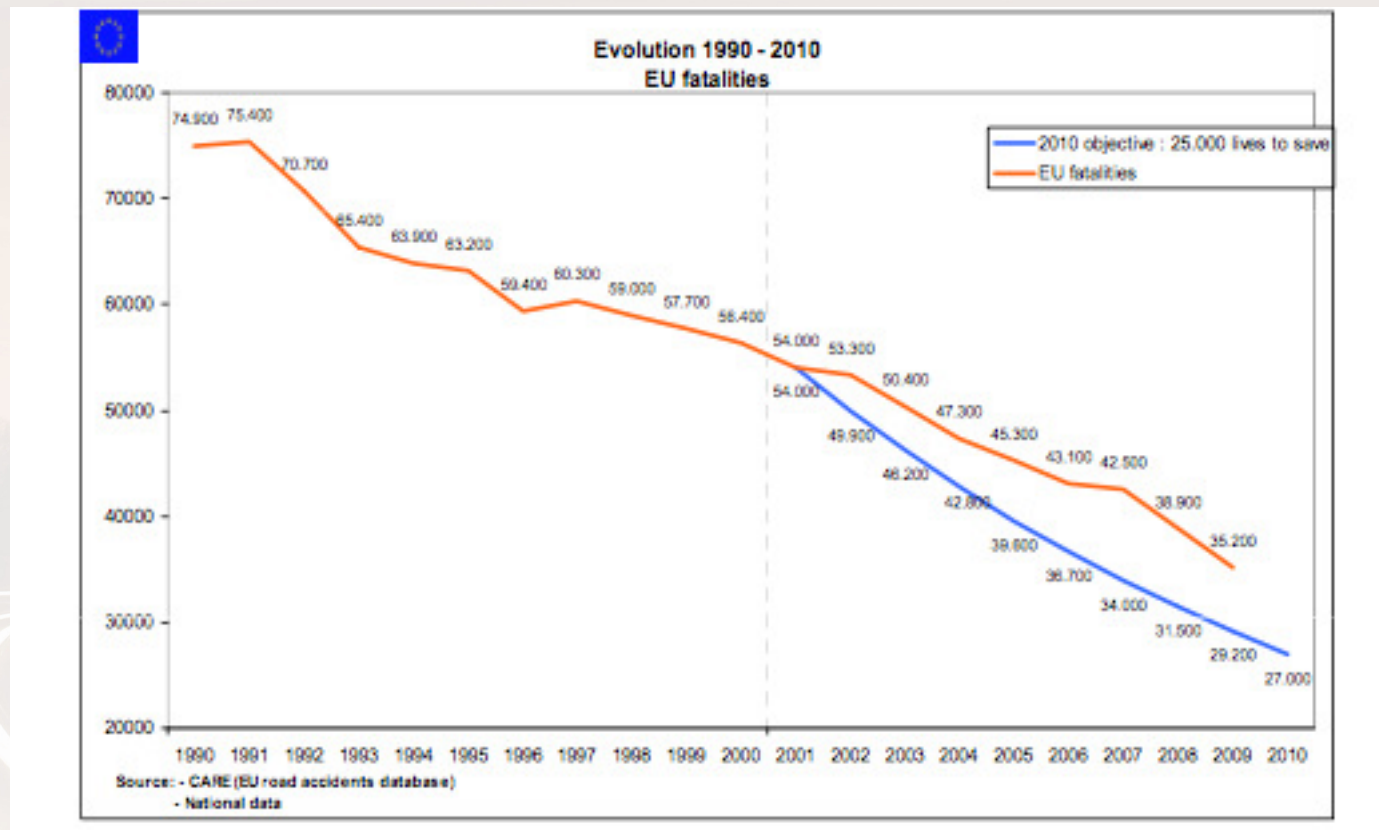
## Road Safety policy in the EU

### The context



# Making a Mark in Europe

## Road Safety policy in the EU 1990-2010





# Making a Mark in Europe

## European Road Safety Action Programme 2011-2020

Objective: 50% reduction compared to 2010 levels

- 7 Action areas focussing on the road safety triangle (driver, vehicle and infrastructure)
- Range of instruments: legislation, policy and communication, research
- Progress to date: 11% reduction in two years

# Making a Mark in Europe

## The Importance of Road Infrastructure

- More than 5 millions km of roads today in EU
- Roads are backbone of the EU economy
  - Access to services
  - Promote regional cohesion
  - Enhance competitiveness
  - Contribute to GDP and jobs
  - 72,7% of inland freight transport and 83% of passenger travelled by road in 2010 (Source: European Road Statistics 2012)



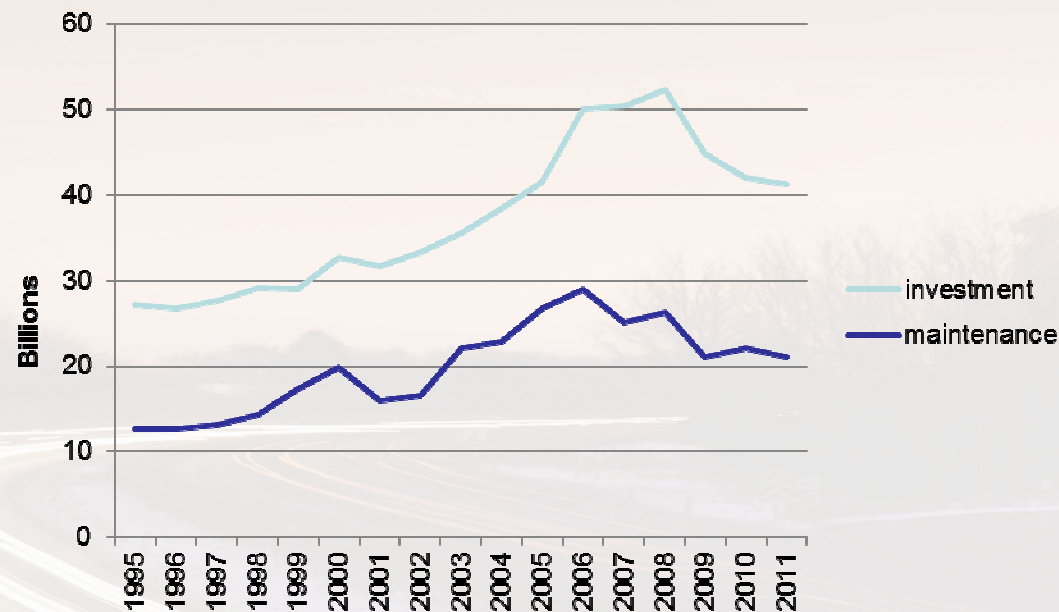
# Making a Mark in Europe

## Spending on Road Maintenance

Steep declines in amounts invested for road maintenance in recent years

**DATA FROM  
20 EU  
COUNTRIES**

Source: ITF



# Making a Mark in Europe

## Spending on Road Maintenance

- Why?
  - Budget constraints
  - But also political commitment at EU Level and Member States for modal shift
  - Roads not considered a political priority
  - Connecting Europe Facility Infrastructure Instrument almost exclusively focussed on railways



# Making a Mark in Europe

## Spending on Road Maintenance

- Experience has shown that when there is sufficient pressure, governments will prioritise road spending.
- CASE STUDY UK:
  - After years of underinvestment, sustainable pressure from road organisations and media led to change of gear
  - In 2013, UK announced biggest programme on road refurbishment since the 1970's
  - A tripling of the existing budget for roads, committing £28 billion (€33bn) between 2015 and 2021.

# Making a Mark in Europe

Spending on Road Maintenance

## Broken Britain!



One hole of a disaster ... our broken roads

UK Road  
Marking  
Performance



# Making a Mark in Europe

## Spending on Road Maintenance

### The problem – Disappearing markings

- Road markings not being replaced when they should be or road authorities go for cheap and in-effective solutions

## UK Road Marking Performance 2013/14

- 43% markings on Scotland's strategic road network (motorways, dual carriageways and principal roads) need immediate replacement
- 63% markings of motorway markings in Wales need immediate replacement
- 47% of markings on all roads in England need immediate or scheduled replacement
- 52% of markings on English motorways need immediate or scheduled replacement

# Making a Mark in Europe

## Spending on Road Maintenance

### The problem – Disappearing markings

- VTI Survey 2012 in Sweden:
  - In most regions, the share of road markings meeting the requirements for dry road markings was less than 50%
  - For wet-road markings, the corresponding figure was 21%!
  - Compared to 2011, % of road markings fulfilling minimum retro-reflectivity criteria fell from 58% to 32%
  - For wet-road markings, it fell from 45% to 21%
- Other Road Authorities in EU Member State do not make the results of their surveys public!



# Making a Mark in Europe

## Spending on Road Maintenance

### The problem – Low quality markings

- Court of Auditors report in German Land of Schleswig-Holstein (2011 concerning budget execution of 2009):
  - Funds allocated to road markings largely in-effective
  - 79% of tenders asking for cheap paints with poor durability
  - 85% asking for Type I markings which are invisible in rainy conditions

# Making a Mark in Europe

## Road Markings: A cost-effective solution

- Road markings are a safety solutions that is:
  - Cost effective
  - Bring about significant improvement in safety
  - Solutions are proven and exist today on a mass scale
- Research evidence shows:
  - Cost benefit First Year Rate of Return on Safety Schemes:
    - 957% for markings schemes (34% accident reduction)



# Making a Mark in Europe

## Further research shows

Audible markings:

- US Research shows circa 65% reduction in carriageway departures

Edge Lines:

- UK research indicates net accident reduction from installation of edge lines of between 43% and 68%

Safety delivered by capacity to Warn, Instruct, Prohibit, Segregate, Guide

Crucially also delivers economic efficiency through congestion and accident reduction.

Informal research beginning into issues surrounding driver comfort and security

# Making a Mark in Europe

## Road Markings: A cost-effective solution

### ➤ Major Institutional Funded Research at European Level

- COST 331 (road laboratories),
- IMPROVER (EC-funded),
- **RAINVISION (EC-funded)**

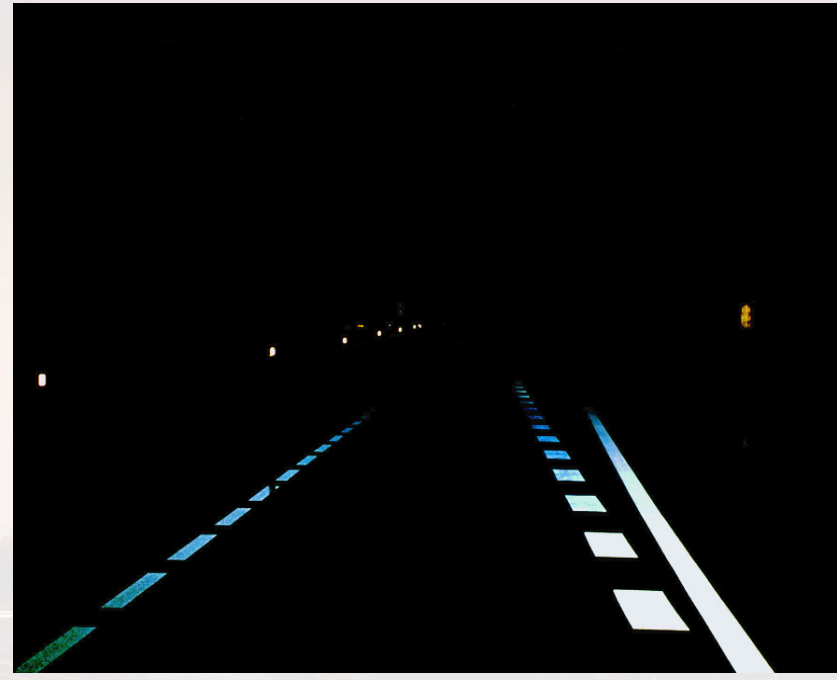
### ➤ Sectoral partnerships

- **Roads that Cars can Read (EuroRap, Car manufacturers & Highways Industry)**
- **Client Industry Reviews (RSMA and NRA)**
- **Public awareness – [www.comparethemarkings.com](http://www.comparethemarkings.com)**



# Making a Mark in Europe

## RAINVISION – The context



What Do You Prefer When Driving Home Tonight?

# Making a Mark in Europe

## RAINVISION Project

### ➤ Objective:

- study the influence of road markings on driver behaviour
- analysing how different age groups and gender groups adapt their driving behaviour on the basis of the visibility and retro-reflectivity marking
- under all weather conditions (dry, wet and wet and rainy) during night-time driving



# Making a Mark in Europe

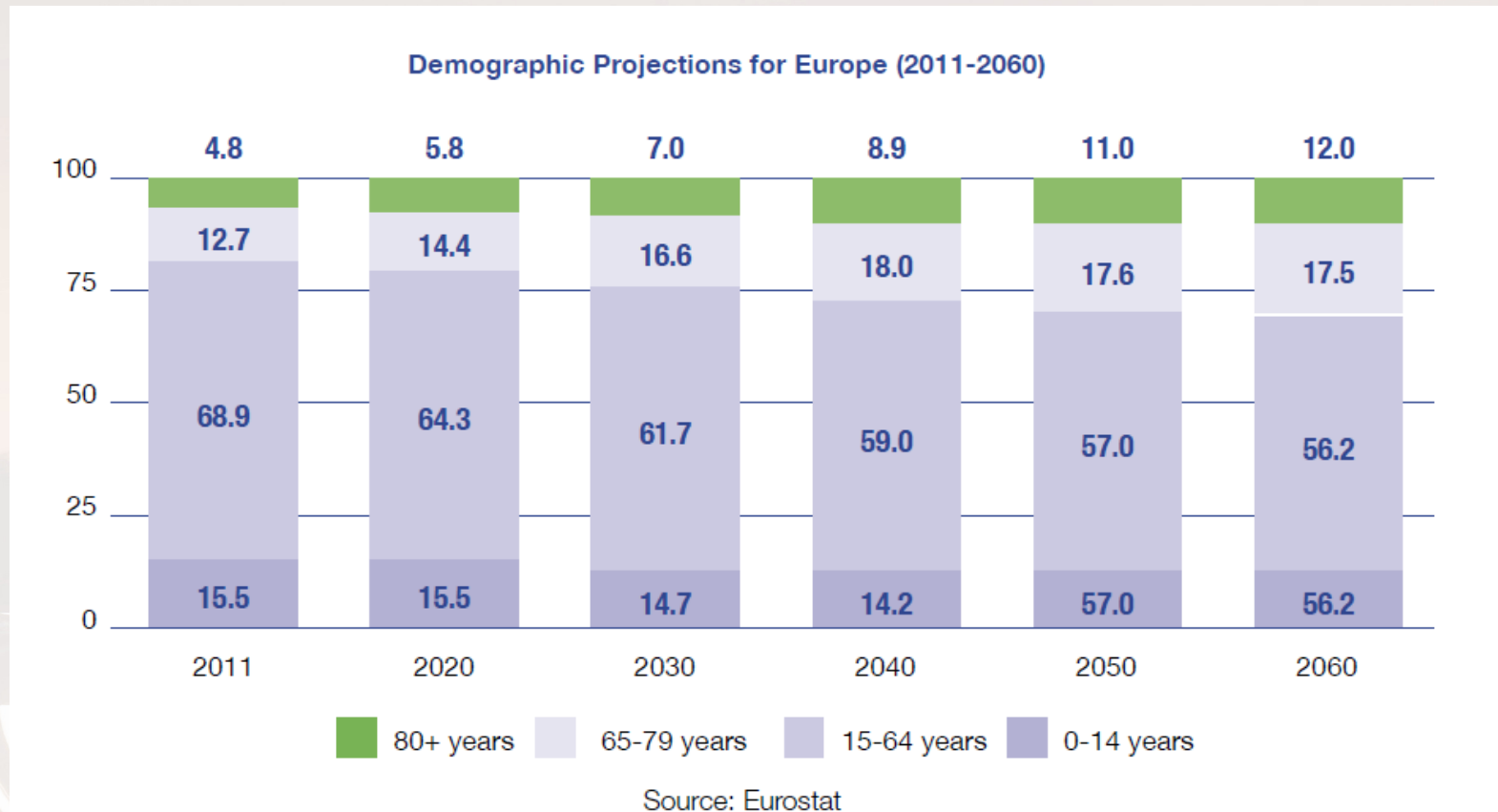
## RAINVISION Project

Series of driver led tests with robust statistical analysis of outcomes

- Cross demographic track test - Austria
- Cross demographic simulator test - France
- 12 month Real world, real time road test – United Kingdom

# Making a Mark in Europe

## RAINVISION Project





# Making a Mark in Europe

## RAINVISION Project

- In 2011, 17,5% of EU population above 65 years old
- To increase to 23,6% by 2020
- Stabilise around 29% by 2050
- Older people display lower reactivity times, yet increasingly mobile/active

# Making a Mark in Europe

## RAINVISION Project

### Track Test in Austria

- Realisation of several track tests during dry, wet, wet and rainy night-time conditions
- **Three scenarios:**
  - Scenario I: no or existing (non-reflective) lane marking (baseline)
  - Scenario II: site equipped with marking material I (dry reflective performance product)
  - Scenario III: Site equipped with marking material II (wet night visibility performance product)

# Making a Mark in Europe

## RAINVISION Project

### Track Test in Austria

Test balanced by age and gender demographic

		Age Group			Total
		20 - 40 years	41 - 60 years	61+ years	
Gender	Female	15	16	10	41
	Male	17	15	15	47
Total		32	31	25	88



# Making a Mark in Europe

## RAINVISION Project

### Track Test in Austria - Results

- driving comfort as well as clearness and perceptibility of track trajectory was assessed best when marking material II (wet-reflective) was applied on the track
- wet-reflective marking material (type II) does increase driving comfort compared to dry reflective marking material (type I)
- For older drivers, driver comfort increased considerable when driving under wet night visible markings compared to the standard baseline
- Better markings did result in an increase in speed of 2-5 km per hour
- This was compensated by better preview times and thus should not be seen as a traffic safety risk

[http://www.rainvision.eu/images/RAINVISION\\_WP3\\_Report\\_final\\_light\\_2.pdf](http://www.rainvision.eu/images/RAINVISION_WP3_Report_final_light_2.pdf)

# Making a Mark in Europe

## RAINVISION Project

Series of driver led tests with robust statistical analysis of outcomes

- Cross demographic track test – Austria ✓ Complete
- Cross demographic simulator test – France
  - Analysis being verified, completion April 2014
- 12 month Real world, real time road test – United Kingdom
  - Analysis underway, expected completion June 2014

Final Report Expected September 2014



# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings

- 2011 – EuroRAP and EuroNCAP publish consultation on need for five star roads to match 5 star vehicle (with specific focus on markings and signs)

[http://www.eurorap.org/media/130623/20110629-roads 20that 20cars 20can 20read 20june 202011.pdf](http://www.eurorap.org/media/130623/20110629-roads%20that%20cars%20can%20read%20june%202011.pdf)

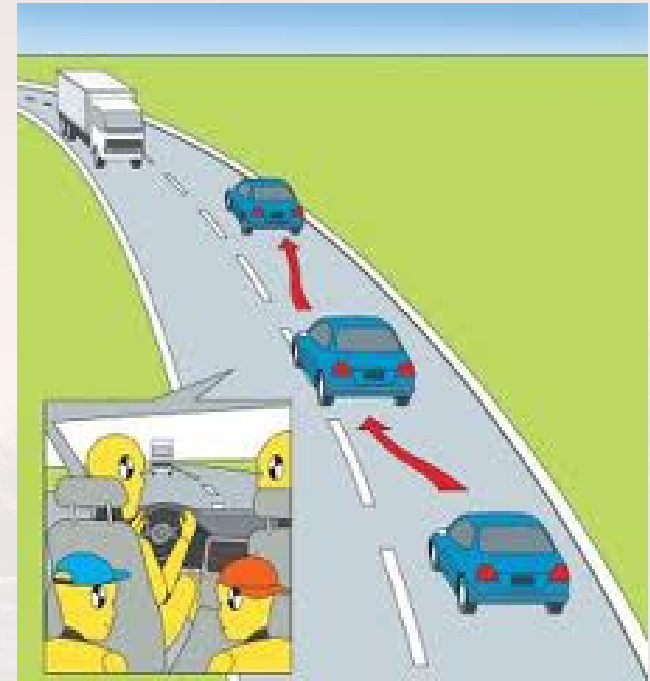
- ERF responded in 2012 to consultation and set up joint working group between EuroRAP, ACEA and ERF in December 2012
- Objective: infrastructure requirements for markings and signs for optimal interaction with ADAS (LDWS/TSR) and the driver



# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings

- Advanced Driver Assistance System can help improve safety
- Lanes Departure Warning Systems / Lane Keeping Assistance can assist driver and prevent run-offs or head on collisions
- The presence of visible markings a requirement for the effective operation of ADAS



# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings

- Raise of awareness of the need for better maintenance of road markings amongst policy makers
- Arrive at the credible definition of a good marking, i.e. one that at all times remains:
  - visible both to the driver and the intelligent vehicle
  - irrespective of light conditions (day vs night),
  - weather conditions (dry vs wet vs wet and rainy) and
  - age (young vs old)
- Solution should be technically feasible and represent a good rate of return in terms of cost-effectiveness

# Making a Mark in Europe

## ROADS THAT CARS CAN READ

A quality standard for markings

### Vehicle manufacturer input

- Establishment of questionnaire for transmission to car manufacturers
  - What levels of performance (according to EN 1436) do LDWS/LKA systems need to operate effectively under different weather conditions?
  - What are the major factors impeding the functioning of LDWS/LKA?
  - How can road marking industry and road operators help in improving the quality of the functions?



# Making a Mark in Europe

## ROADS THAT CARS CAN READ

A quality standard for markings

Vehicle manufacturer input

- 7 Vehicle Manufacturers replied: BMW, Daimler, Ford, Opel, PSA, VolvoCars, Volkswagen
- LDWS/LKA are not designed against specifications within EN 1436 but use internal criteria
- Major problems identified:
  - Worn out markings
  - Small width of road markings
  - Old road markings not cancelled (e.g. work zones)

# Making a Mark in Europe

## ROADS THAT CARS CAN READ

A quality standard for markings

Vehicle manufacturer input

- How could road operators and markings industry help?
  - All roads to be properly marked and the markings maintained to be clearly visible and not confusing
  - Use of retro-reflective markings that are visible under all weather conditions
  - Use of continuous edge lines
  - Harmonise colours and dimensions of road markings

# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings Industry Review and Input

- Perform an analysis of existing regulations for road markings in specific countries (Austria, Belgium, Czech Republic, Denmark, France, Germany, Italy, Sweden and UK)
- Look into previous and on-going research in road markings (COST 331, IMPROVER, RAINVISION, SWOV, TRB + empirical evidence)
- Take into consideration results of 'Roads that Cars can Read Working Group'
- Try to arrive at a definition of a good road marking that would enhance safety primarily from a user point of view and secondly, optimise interaction between infrastructure and intelligent vehicle



# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings Recommendations

- Minimum performance under dry: 150 mcd/lux/m<sup>2</sup> (R3)
- Wet and Rainy: 35 mcd/lux/m<sup>2</sup> (RW2)
- Minimum width: 150 mm
- Edge lines: continuous
- Scope:
  - Motorways (already the case in some countries)
  - Secondary network - where most accidents happen

# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings

- Launched on 27 November at FIA Conference on 'Developing, safe and efficient mobility'
- Endorsed by six leading safety organisations: ACEA, ERF, EuroRAP, EuroNCAP, FIA, IRU
- Accompanied by a joint press release:  
[http://www.erf.be/images/Joint\\_Safety.pdf](http://www.erf.be/images/Joint_Safety.pdf)
- Calling on Member States to honour their declaration at the ITF Summit in Leipzig in May 2013 and provide sustainable financing for road infrastructure  
<http://www.internationaltransportforum.org/2013/pdf/2013-05-23Ministers%20DeclarationPR-%20EN.pdf>
- Consultation from EuroRap and EuroNCap closing April 2014

# Making a Mark in Europe

## ROADS THAT CARS CAN READ A quality standard for markings

- ERF Position Paper on Marking the way towards a safer future

[http://www.erf.be/images/ERF Paper on Road Markings Release d.pdf](http://www.erf.be/images/ERF_Paper_on_Road_Markings_Release_d.pdf)

- EuroNCAP/ EuroNCAP Roads that Cars can Read Consultation Paper

[http://www.erf.be/images/Roads That Cars Can Read 2 Final web.pdf](http://www.erf.be/images/Roads_That_Cars_Can_Read_2_Final_web.pdf)



# Making a Mark in Europe

## CLIENT INDUSTRY REVIEWS

- RSMA and National Road Authority (NRA)
  - Review of contracting and tendering practice
  - NRA sharing Best Practice
  - RSMA Consultation with UK clients and contractors April 2014
- RSMA and Galloway Forest Park
  - Review of Marking Specifications to replace street lighting

# Making a Mark in Europe

CLIENT INDUSTRY REVIEWS



# Making a Mark in Europe

## PUBLIC AWARENESS CAMPAIGNS

- LifeLines 2014
- Compare the Markings

<http://www.comparethemarkings.com>



# Making a Mark in Europe



THANK YOU FOR YOUR ATTENTION

QUESTIONS?

<mailto:glee@rsma.co.uk>

