



Improving Safety in Workzones

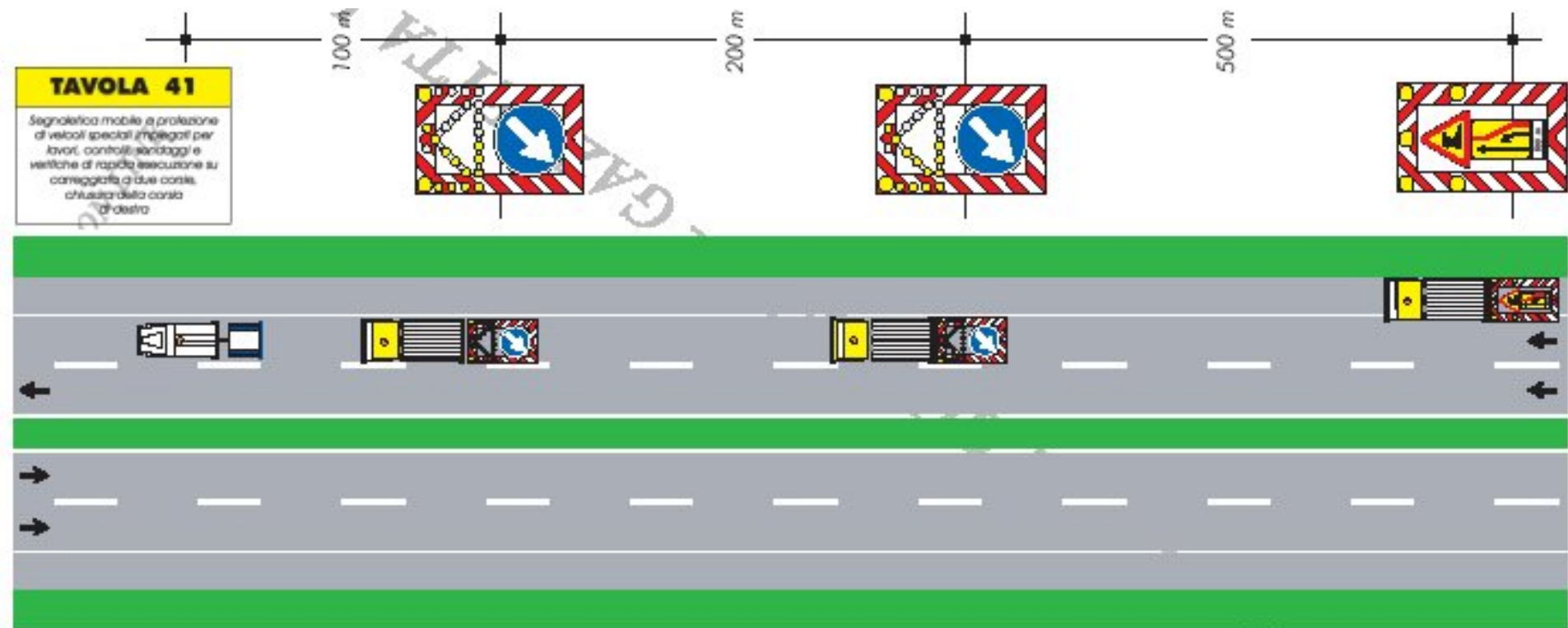
PRAISE Seminar
Brussels, 18 May 2011

- ✓ Risk factors and causes of collisions
- ✓ The process (planning, operation, installation and removal of the works)
 - Issues
 - Good practice solutions or approaches
 - Recommendations for the EU, National Governments and Employers

Variables influencing the level of risk and the safety measures

Types of Work zone	Long-term stationary work Intermediate-term stationary work Short-term stationary work Mobile work
Type of roads	Motorway and dual carriageway Rural primary Rural secondary Urban main Urban local
Types of road work	Mobile Short Medium Long term

Mobile and short term roadworks



Mobile and short term roadworks



- Research to date demonstrate that work on or near roads results in **increased risk** for both **workers** and **road users**
- **Driver behaviour** is a significant contributory factor to collisions at road side work zones
- **Data collection** in relation to road work collisions needs to be improved and harmonised

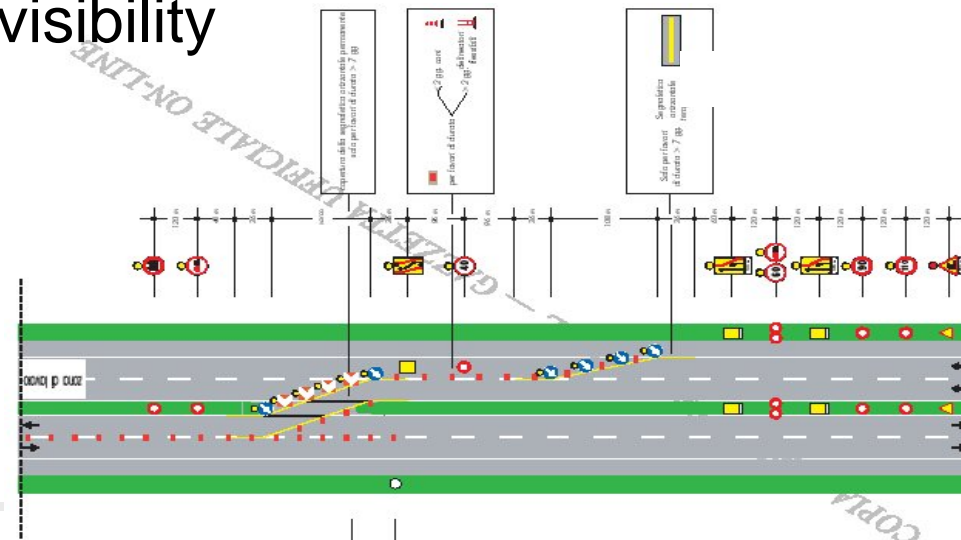
There is a **need for more comprehensive and harmonised data collection in relation to road work zone collisions**, their causes and their consequences.

clear definitions and reporting arrangements need to be established

Traffic volumes, speed before the work zone and in the work zone, weather conditions, time and day of accident, lighting and road surface conditions and general road infrastructure (number of lanes before work zone, type of road) should be included in accident records

- Directive 92/57/EEC relating to *Temporary or Mobile Construction Sites* (minimum safety and health requirements for temporary or mobile construction)
- Safety Framework Directive 89/391/EEC (onus on employers to evaluate the risks to the health and safety of their workers and take the necessary measures)
- Directive 2008/96/EC on *Road Infrastructure Safety Management* (safety must be integrated in all phases of planning, design and operation of road infrastructure)
- Directive 92/58/EEC on Safety and/or Health Signs at Work

- The Department of Transport UK produced the 'Traffic Signs Manual'
- The German Statutory Accident Insurance, professional association for the construction industry and the German Road Safety Council published (2008) a booklet on traffic safety at road works
- In Italy, mandatory legislation (2002) predominantly on signage provision and workers visibility and Coordination Safety Plan required as mandatory for any public work



- Legal standards, legislation and guidance should be **mandatory** and **process based** rather than signage based
- Guidance should include **decision making tools** that aim to achieve **integration between the traffic management and safety objectives**
- Work towards **harmonisation of standards and guidance** nationally and across the EU
- Collate various approaches and **disseminate good practice**

Planning

Installation



Management

Removal

- Design out the need for maintenance - work towards “**zero-maintenance**” roads
- Utilise asset management and life cycle approaches to **target, coordinate and minimise the number of maintenance interventions** required
- Develop tenders which include criteria relating to **provision for safety and safety standards specifically for workers as well as other road users** (e.g. through contractual obligations and budget)
- Investigate the possibility of setting up formal agreements for **coordination between contractors**
- Include **risk assessment of employees and subsequent training and qualification checks** during procurement process

The Irish Code of Practice

- to improve the level of safety and health among small-scale employers and contractors engaging in road works
- to assist them in putting a Safety Statement in place
- to aid risk assessment and safety planning by use of a 'Safe Systems of Work Plan' provided by the HSA

 SAFE SYSTEM OF WORK PLAN (SSWP) WORKING ON ROADS Plan No. <input type="text"/>		
Job Details	Resources Required	Emergency Details
Employer Name: _____ Responsible Person/Supervisor: _____ Number of Workers: _____ Specific Location: _____ Description of Works: _____ Start Date: _____ <i>NOTE: A new SSWP must be completed when the task or the environment changes.</i>	Worker Skills: _____ Plant/Equipment: _____ Hazardous Materials: _____	Contact Names & Tel No. 1. _____ 2. _____ 3. _____ First Aider: _____ Location of First Aid Box: _____ WORK PERMITS REQUIRED Hot <input type="checkbox"/> Electricity <input type="checkbox"/> Excavation <input type="checkbox"/> Confined Space <input type="checkbox"/> Other <input type="checkbox"/> Method Statement Yes <input type="checkbox"/> No <input type="checkbox"/>
Before Works Starts the following MUST be in place Tick the <input checked="" type="checkbox"/> circle when confirmed		
		

The Irish Safe Pass qualification:

- **mandatory training and registration requirements** for workers under safety and health legislation also applying to those working in road maintenance
- Workers must hold a valid **Safe Pass qualification** and must renew this every four years
- A more specific **Construction Skills Certification Scheme (CSCS)** provides for the training, assessment, certification and registration of **construction workers undertaking certain tasks**

- ‘Aiming for Zero’ approach to health and safety including eliminating all fatalities and serious injuries to road workers maintaining the road network
- Goal of ‘Exposure Zero’
- Potential development and use of new technologies which mechanize some of the high risk tasks involved in road maintenance

The Principles of Sustainable Safety

- **Functionality** (the road / street / work zone should be designed to fit its purpose, e.g. cycling)
- **Legibility** (the road, junctions and conflicts should be obvious to all road users, and the resolution of conflict should be mutually understood by all road users and workers)
- **Forgiving Environment** (if an accident should occur, the outcome is as benign as possible for both workers and road users)
- **Homogeneity** (it is safer to mix traffic of similar mass, speed and direction thereby limiting exposure of workers to live traffic)
- **Self Awareness** (road users and workers should be aware of their competence)

- **Integrate occupational safety issues** into the overall road works planning and execution process (every type of road work)
- Ensure **coordination of works** and redress the balance between traffic management and employee safety strategies (e.g. road closures, lane closures, night-time working)
- Carry out a **safety audit and risk assessment for all works** project and adopt a “vision zero” for work zone related collisions
- Provide a **safety statement or plan for each work zone (with a specific responsible)** and **monitor its implementation**
- **Communicate the existence of a work zone** to parties directly or indirectly affected or concerned

Key considerations:

- **Training**, co-ordinating and communicating with personnel
- Basic safety principles governing the design of permanent roads should also govern the **physical design of the road work zone**
- **Vehicles and equipment**
- **Introducing speed restrictions**

- **Signs, lights and guarding are put in place in parallel**
- **Timely communication with the public** (influence road user route choice and travel planning)
- **Training** for deciding what signs and barriers are required
- **One decision maker** is nominated on the site for setting and moving signs

Very similar structure applies in Italy

- Ensure for **co-ordination between the different contractors**
- Ensure that **safety barriers are visible**, especially during the night time and in bad weather
- Apply traffic markings using **yellow retro reflective paint or tapes**
- Use **only well-maintained material**
- Place **signs and other traffic control devices moving in the direction of traffic flow (downstream)**

- Use **only well-maintained material**



- Ensure that legislation on work zone management includes **co-ordination between the different contractors** to take safety into account
- Ensure that contractors start **warning road users of upcoming road works** during the preparatory stage

Five key principles to protect road workers (ARROWS 1998):

- 1. Avoid exposure of workers to traffic**
- 2. Make workers visible to road users**
- 3. Provide physical protection of workers from traffic**
- 4. Protect workers from collisions involving works vehicles**
- 5. Avoid excessive work hours**

Annex I to Final Report for Publication
Road Work Zone Safety
Practical Handbook

ARROWS

*Advanced Research on Road Work Zone Safety Standards in Europe
Contract No. RO-96-SC.401*

Project Coordinator: NTUA - National Technical University of Athens [GR]

Partners: SWOV - Institute for Road Safety Research [NL]
BAST - Federal Highway Research Institute [DE]
VTI - Swedish National Road and Transport Research Institute [SE]
3M - 3M Hellas Limited [GR]
CRR - Belgian Road Research Centre [BE]
CROW - Information and Technology Centre for Transport and Infrastructure [NL]
CDV - Transport Research Centre [CZ]
ZAG - Slovenian National Building and Civil Engineering Institute [SI]

Project Duration: 17 September 1996 to 16 November 1998

Date: November 1998

PROJECT FUNDED BY THE EUROPEAN
COMMISSION UNDER THE TRANSPORT
RTD PROGRAMME OF THE 4th FRAMEWORK
PROGRAMME

physical protection of workers from traffic



- Used for warning/information, closure/guidance, protection (ARROWS or national guidelines)
- Provide specific instructions for signage and usage of TMA's



Effective road work measures:

- 1. Accurate
- 2. Properly-spaced and properly-timed
- 3. Perceptible and “readable”
- 4. Comprehensible
- 5. Ensuring alertness
- 6. Reasonable

Ahead of the works

- Develop web-based information services for drivers on when and where road works are likely to be and about alternative routes or modes (Highways)

The screenshot shows a web browser window displaying the 'Traffic England - Disruption Search' page. The browser's address bar shows the URL 'http://www.trafficengland.com/di...'. The page header includes the 'Traffic England' logo with the tagline 'Check traffic conditions before you travel', the text 'Live traffic information covering England's motorways and major A-Roads', and the 'HIGHWAYS AGENCY' logo. A navigation menu contains links for 'Home', 'Traffic Map', 'Motorway Traffic Flow', 'Disruptions Search' (which is highlighted), 'Traffic Alerts', 'FAQs', and 'Help'. A green banner below the menu reads: 'New! Save your Personalised Views. Find out more. Unavailable - This browser has cookies disabled.' The main content area explains the 'Disruptions Search' feature and provides a search form. The 'Date of Travel' section includes fields for 'Start Date' (16 May 2011), 'Delays for the next' (1 day), and 'Delay Time' (10 minutes and over). The 'Traffic Information' section has checkboxes for 'Incidents & Congestion', 'Planned Events', 'Roadworks', and 'Adverse Weather'. The 'Road / Direction of Travel' section includes dropdown menus for 'Road Type', 'Road Name', and 'Direction', along with a 'Search' button. The footer contains the 'tis' logo, a list of links (Disclaimer, Useful Links, Help, Accessibility, Sitemap, Privacy Policy), and the text 'WB2 RM1'.

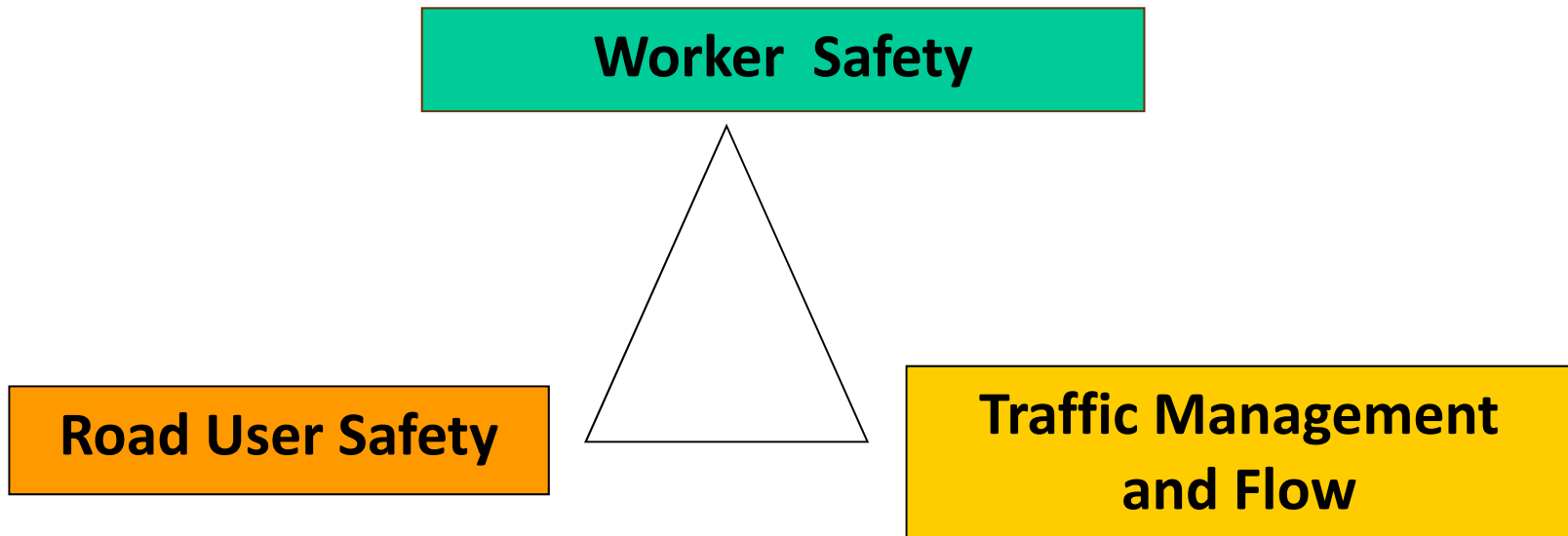
During the works

- Design the approach to the workzone so that road users are notified that they are entering a section requiring more “active” driving
- Use of ITS in informing drivers



- Take extra care and keep to the posted speed limit
- Get into the correct lane in good time – and avoid switching.
- Concentrate on the road ahead – not the road works
- Be alert for works traffic leaving or entering the road
- Keep a safe distance – there could be queues in front
- Observe all signs – they are there to help you

- A balance should be achieved between Traffic Management and Flow, Worker Safety and work Users Safety



- Keep lower speed limits in workzones (they can be differentiated across lanes and for time of day)
- Inform users why a road is closed without visible activity in order to ensure the respect of speed limits (i.e. The Netherlands)
- Enforcement (speed cameras, police presence)



The White Book on Road Works

- Addresses ten main safety problems and solutions stressing firstly co-ordination between road works
- Raises the need to ensure that traffic trying to avoid road works on one site may end up in another road work site
- Stresses the legal obligation in Belgium for the appointment of a safety coordinator
- Safety should also be included in the training and existing certification scheme for safety co-ordinators

- The Portuguese Road Institute has developed and implemented a worker safety management system for new road construction projects reviewed by the EU OSHA
- Provides a common safety framework for all parties involved in a road construction project
- Systematically establishes the health and safety obligations and responsibilities of each party
- Resulted in a collision reduction rate of between 30 and 40%

- Review progress of MS in implementing the Infrastructure Safety Directive (2008/96/CE)

Safety inspections

- 1. Member States shall ensure that safety inspections are undertaken in respect of the roads in operation in order to identify the road safety related features and prevent accidents.*
- 2. Safety inspections shall comprise periodic inspections of the road network and **surveys on the possible impact of roadworks on the safety of the traffic flow.***
-*
- 4. Without prejudice to the guidelines adopted pursuant to Article 8, Member States shall adopt **guidelines on temporary safety measures applying to roadworks.** They shall also implement an appropriate inspection scheme to ensure that those guidelines are properly applied.*

- Harmonize road works design standards

- Comply with requirements set out in the Infrastructure Safety Directive
- Recognise that the decrease of traffic congestion from road work zones will have a positive impact on safety, save costs and reduce CO2 emissions
- Enforce legislation protecting safety of road workers and give feedback on preventative measures for managing risk to employer on road works

Conclusions (1/2)

- Road works safety is an issue but there is a lack of consistent data over the different European countries;
- EU should establish uniform guidelines for data collection, work sites layouts and training of personnel;
- Each road worksite should have a trained safety responsible (eg. Ireland, Italy et al.);
- Physical protection of road work sites should be included as mandatory in national regulations;

Conclusions (2/2)

- Work towards minimising maintenance activities (“zero maintenance roads”) and road worksites (through asset management);
- There is a need for a coordination among different contractors;
- Review progress of MS in implementing the Infrastructure Safety Directive as it concerns Road safety inspections of roadworks and disseminate good practices.