Speed Management Working Group Status Report

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Background

- JTRC formed 1 January 2004 from previous OECD and ECMT divisions
- 1st JTRC work programme
  - One consolidated speed project, based on proposals by Australia, Canada and Norway
- 19 countries including USA and Canada participating in speed management project
Aims of Working Group - 1

- To review current knowledge about effects of speed
  - Road safety, pollution, energy, operational costs, travel times
  - Quality of life (e.g. noise), urban growth, etc
  - Focus on 1995-2005 period
    - Comprehensive prior studies:
      - TRB #254 Managing Speed (USA)
      - MASTER Project (European Commission)
      - Safety, Speed and Speed Management (Transport Canada)
Aims of Working Group - 2

- To examine speed management methods
  - Current & best practices
  - Promising research
- To define a global approach to speed management, based on objective assessment of alternatives
- To make recommendations
Why “Speed Management”? 

- 30% of fatal accidents due to speed 
- Extensive speeding 
- Speed is key to collision avoidance and mitigation of injuries 
- Speed mgt methods are expanding 
- Increasing awareness of speed-energy relationship 
- Urban area challenges - Intersections, pedestrians, cyclists 
- Road design often does not help the driver to respect the speed limit
Effects of speed

- Speed has consequences on:
  - Road safety
  - Traffic flows
  - Environment (pollution and noise)
  - Energy use
  - Travel times
  - Economics
  - Urban spreading
  - Quality of life…
Speed and injury severity

![Graph showing the relationship between change in mean speed (km/h) and change in accidents (%). The graph includes lines for Fatal, Severe injury, and All categories. The data source is Andersson & Nilsson 1997.](image)
Questionnaire
in 6 parts

• Speed limits
• Actual speeds
• Effects of speed
• Speed management measures
• Enforcement
• Research on new speed management measures
Questionnaire results

National maximum speed limits

<table>
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<tr>
<th>Limit, km/h</th>
<th>No. of Countries</th>
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<td>6</td>
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<tr>
<td>130</td>
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</table>
Questionnaire results

- Differential speed limits
  - Trucks and buses, e.g. 130 > 100, 110 > 90
  - Speed limiters mandatory for trucks and buses
  - Speed reductions for rain, fog, snow
    ✓ France, Japan, Korea, Sweden, UK
  - Speed reductions for novice drivers
    ✓ Canada, France
Questionnaire results

• Variable speed limits in common use
  ➢ School zones
  ➢ Work zones
  ➢ Bridges, Tunnels
  ➢ Congestion management – Manual & automatic systems in several countries
  ➢ Incident management
Questionnaire results

Average speeds on main roads
(19 countries)

- **Average speed, km/h**
  - Low
  - High
  - Canada

- **Speed limit, km/h**
  - 90
  - 100
  - 110
  - 120
  - 130

- **Countries**
  - Canada
Scope of report, 1

- Effects of speed
- Road safety philosophies
- Driver attitudes towards speed and new measures
- Speed management methods
- Roles of the various actors
- Infrastructure
- Speed limits: How to set
- Driver information: Signing and signals
- Education and Training - Information Campaigns
Scope of report, 2

- Vehicle Engineering (not ITS): Governors, conventional and adaptive cruise control (ACC)
- ITS systems - Intelligent Speed Adaptation (ISA) and Speed Alert
- Enforcement
- An Integrated Approach to Speed Management
- Future technologies to manage speed
Speed and travel times (TT)

- Higher speeds lead to reduced travel time.
- But time reduction is negligible, at least in urban areas, because of traffic signals.
- In one example, TT increased by 16-22%, if maximum speed was 30 km/h instead of 50 km/h. (Toulouse, France)
Driver behaviour

- Main factors influencing the choice of the speed
  - Perceptual aspects of speed control by drivers
  - Cognitive and motivational aspects involved in the driving process
  - Attitudes, beliefs and subjective norms of drivers
What can we do?

- Effective speed management is a complex undertaking requiring the involvement of a variety of actors
- To implement a consistent speed management policy, it is necessary to assess (*inter alia*):
  - Each element of the speed management policy
  - Possible interactions
    - among speed management elements
    - Between speed management and non-speed measures within the sphere of control
Speed and infrastructure

• Examples of different measures in use
  ➢ Gates, islands and reservations
  ➢ Narrowing, staggering, humps
  ➢ Roundabouts (various types)
  ➢ 30 km/h zones
  ➢ Differences between urban and rural areas
Infrastructure examples
Roundabouts
Mini-roundabouts
Other treatments
Speed limits

• Which factors are taken into account in national/regional speed limits?

• What are the means for deciding:
  ➢ To set a local speed limit;
  ➢ To decide the level of the limit?

• Importance of credibility
  ➢ Widespread speeding
  ➢ Lack of enforcement
Signing and signalling

- Signing and signalling based on rules set out in Highway Traffic Acts, etc
- Variable signing provides new possibilities (e.g.: traffic regulation on motorways)
- The driver should be continuously aware of the speed limit
- Signing and signalling efficiency cannot be measured at location level only
- Traffic lights can also be used to manage speed
Use of signalling for reducing speed

- The moderating green waves
Vehicle engineering

- Different types of systems exist:
  - Conventional systems (e.g. governors, cruise control)
  - ACC (adaptive cruise control)
  - Electronic stability systems ESP, ESC, etc.
  - On-board data capture – EDR (trucks)

- What are their potential effects on speed?
Intelligent Speed Adaptation (ISA)

General principle
ISA - 2

- Several systems being studied
- Autonomous
- Co-op vehicle-roadside
ISA - 3

- ISA has been shown to work in small-scale trials in limited urban areas
- Large scale tests are needed to assess
  - Acceptability
  - Effectiveness (safety, energy, pollution, urban goals)
  - Negative effects (travel times?)
ISA - 4

• The problem of updating the databases is crucial

• Highway speed choice dilemma – How much uniformity is necessary?
Training and education

- Children cannot be trained to behave safely; therefore the traffic environment must be designed so that drivers adapt their behaviour to the abilities of children.
- Professional training programs have a large potential to reduce crash involvement.
- Long lasting effects of campaigns seem to be hard to get; campaigns should be conducted on a regular basis and more often.
Enforcement

• New systems (automatic radar) are available; do they provide significant effects?

• The aim of speed enforcement is to convince drivers that the likelihood to be detected and punished is high

• Penalties should have both a *specific* deterrence effect – the impact of sanctions on apprehended drivers – and a *general* deterrence function

F. Cepas, DSCR
Integrated approach to speed management and evaluation

• How to assess and compare measures in standardized manner?
• Role of simulation models?
• How to build a general policy that encompasses speed measures focused on road, vehicle and driver?
• Institutional challenges and changes
The Future

• Existence of new concepts (too early to be integrated and evaluated):
  ➢ Lane keeping
  ➢ EDRs (event data recorders)
  ➢ SARI, etc.

• Possible role and negative effects of these new approaches

• Limits on engine power and max speed: A controversial answer.... to a real problem
Next steps

• Complete and circulate draft report - June
• 4th WG meeting (with industry) - September
• Present report to JTRC - Fall
• Final report: Early 2006
• Conclusions & recommendations for the OECD Ministerial Session in May 2006 in Dublin
• Put findings to use in new national policies, speed programs and research
Acknowledgements

• Chairman, Speed Management WG
  ➢ Jacques Nouvier, (CERTU, France)

• OECD-ECMT Joint Transport Research Centre
  ➢ John White (Head)
  ➢ Veronique Feypell-de la Beaumelle (Administrator)
For further information:
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Conclusion / Discussion