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Ministry of the Environment (MOE), Japan
Partnership on Sustainable, Low Carbon Transport
United Nations Economic and Social Commission for Asia and the Pacific, and
United Nations Office for Sustainable Development

TENTH REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT (EST) FORUM IN ASIA,
14-16 MARCH 2017, VIENTIANE, LAO PEOPLE’S DEMOCRATIC REPUBLIC

Economics of Road Safety – What does it imply under the 2030 Agenda for Sustainable Development?

(Presentation for EST Plenary Session 10 of the Provisional Programme)

Final Draft

This presentation has been prepared by Prof. Jac Wismans, SAFER Vehicle and Traffic Safety Centre at Chalmers University for the Tenth Regional EST Forum in Asia. The views expressed herein are those of the author only and do not necessarily reflect the views of the United Nations.

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Economics of Road Safety – What does it imply under the 2030 Agenda for Sustainable Development?

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Background paper for the 10th Regional Environmentally Sustainable Transport (EST) Forum in Asia, 14-16 March 2017 in Vientiane, Lao PDR
Objectives Background Paper

• Review the Road Safety problem in the Asian EST region
• Discuss the SDG’s on Road Safety and Asian “goals, targets and indicators”
• Present a Dashboard on the status of road safety in the EST region
• Introduce the basics of road safety economics and the benefits of road safety investments
• Recommendations on the most cost-effective road safety measures in Asia
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The Road Safety Problem in Asian EST region: number of fatalities

- South Asia: 2010 blue, 2013 orange
- Southeast Asia: 2010 blue, 2013 orange
- China: 2010 blue, 2013 orange
- Rest: 2010 blue, 2013 orange
- Total: 2010 blue, 2013 orange

Number of fatalities:
- 0
- 100000
- 200000
- 300000
- 400000
- 500000
- 600000
- 700000
- 800000
Vulnerable Road Users in 2013 (WHO)

- Russian Federation
- Bangladesh
- India
- Mongolia
- Myanmar
- Indonesia
- Republic of Korea
- China
- Japan
- Malaysia
- Philippines
- Lao PDR
- Sri Lanka
- Singapore
- Thailand
- Cambodia

Legend:
- Blue: Pedestrians %
- Orange: Cyclists %
- Gray: Riders motorized 2- or 3 wheelers %
Fatalities are just the top of the Iceberg
(WHO 2013/2015 and Worldbank/IHME 2014)

In addition to 700,000 fatalities, in the Asian EST region there are 50 million people injured, of which 6 million requiring hospital admission.
United Nations Road Safety milestones

- 1958 Agreement on Technical Vehicle Regulations,
- 1968 Convention on Road Signs and Signals
- 1969 Convention on Road Traffic: Vienna Convention
- 1957 Agreement on Transport of Dangerous Goods,
- 1997 Agreement on Periodic Techn. Inspection of Vehicles
- 1998 Agreement on Global Technical Regulations (GTR’s)
- 2004 World report on road traffic injury prevention and start of the UN Road Safety Collaboration (UNRSC)
- 2010 Start Decade of Action 2011-2020 for Road Safety
- 2015 2030 Agenda for Sustainable Development
<table>
<thead>
<tr>
<th>Targets</th>
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</thead>
<tbody>
<tr>
<td>3.6: by 2020, halve the number of global deaths and injuries from road traffic accidents.</td>
</tr>
<tr>
<td>11.2: by 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women and children, persons with disabilities and older persons.</td>
</tr>
</tbody>
</table>
SDG target 3.6: By 2020, halving number of fatalities and injuries
Road safety goals, targets and indicators in Asia: UNCRD-EST

• 2010: Bangkok 2020 Declaration, Goal 13: Adopt a zero-fatality policy

UNESCAP Road safety goals, targets and indicators

- 2006: Declaration on Improving Road Safety in Asia & Pacific: save 600,000 lives from 2007-2015
- Dec. 2016 (Moscow) Ministerial Conference on Transport: update 8 goals with corresponding targets and indicators in view of Decade of Action for Road Safety and the SDG’s
Overall objective: 50 per cent reduction in fatalities and serious injuries on the roads of Asia and the Pacific over the period 2011 to 2020

8 GOALS
1: Making road safety a policy priority
2: Making roads safer for vulnerable road users
3: Making roads safer and reducing the severity of road crashes (“self-explaining” and “forgiving roads”)
4: Making vehicles safer and encouraging responsible vehicle advertising
5: Improving national and regional road safety systems, management and enforcement
6: Improving cooperation and fostering partnerships
7: Developing the Asian Highway network as a model of road safety
8: Providing effective education on road safety awareness

30 Targets
40 Indicators
Road safety economics: cost categories

- Medical costs
- Administrative costs
- Property damage costs
- Production loss
- Human costs: suffering, pain etc.
## Methodologies for determining accident costs

<table>
<thead>
<tr>
<th>Cost Type</th>
<th>Human Capital Method</th>
<th>Willingness-to-Pay Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical costs</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Administrative costs</td>
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<td>Property damage costs</td>
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<td>Production loss</td>
<td>Gross production loss</td>
<td>Net production loss</td>
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<td>Consumption loss</td>
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<td>Human costs</td>
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</tbody>
</table>

- **Value of Statistical Life (VSL)**: \[ VSL = 70 \times GDP/capita \]
- **Value of Statistical Injury (VSI)**: \[ VSI = 17 \times GDP/capita \]

Simplified method: iRAP “Rule of the Thumb” method
Economic Burden of Road Accidents in Asian EST Region

Total costs: 735 billion US$ (iRap method)
Economic Burden of Road Accidents in Asian EST Region

Average percentage loss of GDP: 3.3%
Cost-effective measures

• Meeting SDG 3.6 in the ASIAN EST would reduce the burden on the economy > 350 billion USD per year (1.5% growth in GDP).
• Significant efforts in policy development are needed to achieve the SDG’s related to traffic safety.
• In the background paper many examples of cost-effective measures are presented like on helmets, speed, drunk driving, vehicle safety requirements, ITS, public transport and infrastructure measures for pedestrians and cyclists.
• Many of these measures can be implemented relatively fast without the need of cost benefit analyses.
Road Safety Framework

A Safe Road Transport System

Safe Speed

Safe Vehicle
Criteria:
- Five-star rated by Euro NCAP
- Electronic Stability Control

Safe Road
Criteria:
- Four-star rated by Euro RAP

Safe Road User
Criteria:
- Wears a seat belt
- Follows the speed limits
- Sober

Biomechanical limits that the road user can tolerate without sustaining severe injuries
Effect of Speed on Fatality Risk

Pedestrians and cyclists

Side collisions

Frontal collision or with hard object

Collision speed km/h

fatality risk %
Dashboard of road safety measures in Asian EST region
# Dashboard

<table>
<thead>
<tr>
<th>UNESCAP Indicator</th>
<th>Related WHO 2015 indicator</th>
<th>Afghanistan</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>Brunei WHO 2013</th>
<th>Cambodia</th>
<th>China</th>
<th>India</th>
<th>Indonesia</th>
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<tr>
<td>1</td>
<td>Number of road death /100,000 pop.</td>
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<td>Numbers of pedestrian deaths</td>
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<td>Number of motorcyclist deaths</td>
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<td>National Road Safety strategy?</td>
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<td>16</td>
<td>Name of designated lead agency on road safety</td>
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<td>Formal audits for new road construction projects</td>
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<td>Regular inspections of existing road infrastructure</td>
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<td>Policies to promote walking or cycling</td>
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<td>Policies to separate road users and protect VRUs</td>
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<td>12 Law for child restraints in cars?</td>
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<td>13 Usage and enforcement of child seat restraints?</td>
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<td>26 National seat belt law</td>
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<td>Applies to drivers and passengers</td>
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<td>Enforcement level</td>
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<td>Seatbelt wearing rate, front/rear in %</td>
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<td>National Law mobile phone use during driving?</td>
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<td>26/-</td>
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</tr>
</tbody>
</table>
Recommendations

• In the background paper recommendations are presented concerning economics of road safety, effective road safety measures, a dashboard for road safety etc…

• A few of the recommendations will be summarized here.

12 Recommendations in the Background paper
Good accident data needed

- Introduction of good data systems for accidents including establishment of a “baseline” status
- Analyses of the accident data
Enforcement of laws concerning risk factors

If not done yet implement laws concerning risk factors (speed, helmets, seat belts, drunkdriving etc..) and introduce and maintain a strict enforcement policy concerning such measures.
Safety of vulnerable road users

- Invest in infrastructure that benefits pedestrians and cyclists. Such investments are highly cost effective.
- If such measures cannot simply be implemented, strict speed measures (< 30 km/h) should be introduced in case of mixed traffic.
Include safety in road network and public transport planning

• In the stage of road network and public transport planning, road safety should be taken into account in any Cost Benefit Analysis, next to mobility and environment.

• Public transport is much safer per km travelled then other forms of transport, which should be taken into account in the analyses.
Economics of Road Safety

• For Cost Benefit Analysis the Human Cost are very important to take into account and the WTP approach is the recommended method to determine the Value of Statistical Life (VSL).

• If VSL data are not available it is recommended to use the iRAP “rule of the thumb method” to estimate VSL.
## Funding opportunities

<table>
<thead>
<tr>
<th>Name</th>
<th>Goal</th>
</tr>
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<tbody>
<tr>
<td>The World Bank Global Road Safety Facility (GRSF)</td>
<td>Increase funding and technical assistance for global, regional and country level initiatives designed to enable low- and middle-income countries to implement their own road safety programmes.</td>
</tr>
<tr>
<td>The FIA Foundation</td>
<td>Ensure safe, clean, fair and green mobility of all via road safety philanthropy, practical environmental research, interventions to improve air quality and tackle climate change, and strategic advocacy in road traffic injury prevention and motor vehicle fuel efficiency.</td>
</tr>
<tr>
<td>The Road Safety Fund of the FIA Foundation and WHO</td>
<td>Facilitates alliances between private sector donors and NGOs to support road injury prevention programmes in countries and communities</td>
</tr>
<tr>
<td>The Road Safety Grants Programme</td>
<td>Support country- and city-level NGO projects to develop and deliver high-impact, evidence-based interventions designed to strengthen road safety policies and their implementation.</td>
</tr>
</tbody>
</table>
| Bloomberg Philanthropies Initiative for Global Road Safety           | Strengthen national road safety legislation, and implement proven road safety interventions at the city level. }
Acknowledgements

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> 30 partners in collaboration

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