Promoting safe and sustainable cities with public transport

Jaspal Singh
International Association of Public Transport, UITP

@TheJaspalSingh
A WORLDWIDE ASSOCIATION

16 regional offices, 2 centres for transport excellence
A DIVERSE MEMBERSHIP

1600 member companies from 100 countries

- Operators
- Authorities
- Policy decision-makers
- Research institutes
- The public transport supply ar

+1,600 MEMBER COMPANIES

FROM 99 COUNTRIES

OFFICES 16
OUR MISSIONS

We engage with decision-makers, international organisations and other key stakeholders to promote and mainstream public transport and sustainable mobility solutions.

We inspire excellence and innovation by generating and sharing cutting-edge knowledge and expertise.

We bring people together to exchange ideas, find solutions and forge mutual beneficial business partnerships.
Road Safety

Promoting safe and sustainable cities with public transport
MORE PUBLIC TRANSPORT...

Fatalities per Billion passengers

<table>
<thead>
<tr>
<th>Travel Mode</th>
<th>Deaths per Billion Passenger-Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car or light truck driver or passenger</td>
<td>0.28</td>
</tr>
<tr>
<td>Commuter rail and Amtrak</td>
<td>0.43</td>
</tr>
<tr>
<td>Urban mass transit rail (subway or light rail)</td>
<td>0.24</td>
</tr>
<tr>
<td>Bus (transit, intercity, school, charter)</td>
<td>0.11</td>
</tr>
<tr>
<td>Commercial aviation</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Source: Savage 2013

Source: Litman (2014)
EVERYTHING UITP DOES IMPACTS ROAD SAFETY

Here are 200 people in 177 cars

<table>
<thead>
<tr>
<th></th>
<th>Feasible</th>
<th>Desirable</th>
</tr>
</thead>
<tbody>
<tr>
<td>177 Cars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 people without cars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 people on bike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 buses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 buses + bike</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vision Zero Vs. Public Transport

- Public transport is often an overlooked solution to road safety. UITP is working on a reference document for members.
- The paper simply highlights that public transport is good for road safety. It includes recommendations for cities and countries as well as some case studies from members.

UITP has just joined the UN Road Safety Collaboration. The group aims to share best practice on road safety.
Paper to be released in Feb’2020
PUBLIC TRANSPORT ACCIDENTS
95% of accidents are caused by human error.

- Tiredness & Drowsiness: 37%
- Loss of Attention: 21%
- Drugs, Alco, Pharma: 16%
- Stress & Diseases: 10.5%
- Other Disorders: 10.5%
## The Nature of Pt Accidents

### What is ‘human factor’?

<table>
<thead>
<tr>
<th>Human Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition errors</td>
<td>38.6%</td>
</tr>
<tr>
<td>Decision errors</td>
<td>32.4%</td>
</tr>
<tr>
<td>Action errors</td>
<td>9.8%</td>
</tr>
<tr>
<td>Sleepiness, conscious loss</td>
<td>6.7%</td>
</tr>
<tr>
<td>Other human mistakes</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

### Critical (actual) reasons of accidents

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inattentiveness &amp; fatigue</td>
<td>37%</td>
</tr>
<tr>
<td>Sleepiness &amp; loss of awareness</td>
<td>21%</td>
</tr>
<tr>
<td>Influence of alcohol/drugs/other substances</td>
<td>16%</td>
</tr>
<tr>
<td>Stress &amp; illnesses</td>
<td>10.5%</td>
</tr>
<tr>
<td>Other psychophysiological problems</td>
<td>10.5%</td>
</tr>
</tbody>
</table>

* – According to Horizon project. Safety Cube researches funded by the European Commission, 2017
RESULTS OF ROAD SAFETY PROGRAMMES IN EU

The maximum of current methods effectiveness has been reached

Numbers given according to the European Transport Safety Council http://etsc.eu/euroadsafetydata/

Results of the safety programme:
- measures for speed restriction,
- wearing belt;
- tachographs,
- control of stability,
- system of monitoring of blinking & head position;
- “Dead man” button;
- Infrastructure improvements;
- Phone calls and others

Mortality due to car accidents (% from the baseline)

2010 2013 2016 2017 2018 2019
THE NEXT BIG STEP IS TO ACT IN ADVANCE

Implementation of level-up technologies allows **to identify the high-risk human states much earlier**, giving the substantial time lag for the person to normalize.

The technologies act preventively so **that they considerably lower the risks of accidents**.

1. To change the situation, you need to **directly impact the cause.**
2. **Assess, differentiate and digitalize persons’ psychophysiological conditions leading to critical mistakes.**
3. **Correctly identify the individual optimal working condition, transients and alarm zones.**
MEASURING QUALITY OF LIFE (EC 8+1 LIFE QUALITY INDICATORS)

Driver’s Physical and Mental State (PMS) and Driver’s Feeling of Safety and Life Quality are mutually influenced and mirrors each other. Thus Driver’s PMS monitoring, prevention of its worsening in advance and positive influence promotes High Safety and Life Quality for the Driver and the Society.
SYSTEMS THAT DIRECTLY TACKLE 95% OF THE CRITICAL CAUSES OF ACCIDENTS

HUMAN FACTOR RELIABILITY MANAGEMENT SYSTEMS FOR ANY TRANSPORTATION

ASPE (Automatic System for Pre-Trip Examinations)
Accurate determination of conditions leading to critical errors, transients and risk zones according to more than 40 parameters of the pulse wave shape, blood pressure and heart rhythm
- Recognition of a wide spectrum of diseases in the early stages of development
- Including - cardiovascular
- Preventing Sudden Death Risk

CoPilot (System for Online Functional State Monitoring)
Monitoring of the functional state in real time and early warning of dangerous states: monotony, falling asleep, fatigue, sudden deterioration of health, stress, illness, etc.
- Issue of warning signals to the driver
- Dispatcher Warning
- Location tracking
- AI Self-learning. Maintaining the optimal working condition of a person
One of the core advantages is that the system ensures substantial increase of drivers’ time in optimal working conditions resulting in improvement of driver job performance.

The system decreased time spent in monotony by 3 times, eliminated cases of falling asleep and ensured optimal working conditions.
OTHER EXAMPLES – TAXI COMPANIES
DRIVER FATIGUE AND ATTENTION CONTROL

- Real-time processing with audible alerts
- AI-based fatigue detection algorithms
- Privacy: AI-powered devices with no personal data transferred to the cloud

Source: Yandex. Taxi (Moscow) / DTC (Dubai)
ACCIDENT PREVENTION SYSTEM

Fatigue & distraction monitoring and alerting

88% reduction in fatigue events
Collision warning and alert system facilitates in avoiding accidents. Event captured also facilitate in profiling drivers and to issue performance standards.
THANK YOU!

jaspal.singh@uitp.org

@TheJaspalSingh
jaspalsingh82