ISA: The Research Evidence

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“Speed remains a very important risk factor. It has a greater effect on the number of accidents and injury severity than almost all other known risk factors.”

We know a lot about speed and risk
Sevirty: the power model

Andersson and Nilsson, 1997; Nilsson, 2004; Elvik et al., 2004; Elvik, 2009:

- Injury accidents go up approximately with the proportionate change in speed squared for a length of road
- Serious injury accidents with speed cubed
- Fatal accidents with speed to the fourth power

Source: Nilsson, 2004
Collision speed and the risk of car driver death in frontal collisions

Source: DfT, 2010
(dashed lines show 95% confidence interval)
Impact speed and the risk of pedestrian death

Source: DfT, 2010
(dashed lines show 95% confidence interval)
Collision speed and the risk of car driver death in side collisions

Source: DfT, 2010
(dashed lines show 95% confidence interval)
Real-world trials

Finland (2001-)
ISA-UK (2001-2006)
Two projects in Belgium (2001-2002)
LAVIA in France (2002-2006)
Austria (2003-2004)
Norway (2005-)
+
Australia (TAC SafeCar and NSW)
Japan (Soft Car)
Assisting ISA: effect on behaviour and attitudes
The ISA-UK trials

2 urban trials
(1 private motorists, 1 fleet)

2 rural trials
(1 private motorists, 1 fleet)

79 drivers with a mix of:

Younger / older
Male / female
Speeding intenders / non-intenders
An overridable assisting system

- System that limited speed to the prevailing limit (no acceleration beyond limit)
- Drivers could override at will
- Vibration on throttle pedal to prevent over-throttling
Speed distribution on 30 mph (50 km/h) urban roads
Speed distribution on 70 mph (110 km/h) roads
Acceptability

Mean Score

-2
-1
0
1
2

Time 1
Time 2
Time 3
Time 4

Time Point

Usefulness
Satisfaction*

Before
Early with
Late with
After

Using the bar chart, we can see the changes in mean scores for usefulness and satisfaction over different time points:

- **Before**: The mean scores for usefulness and satisfaction are close to 0, indicating neutral or average perceptions.
- **Early with**: There is a slight increase in the usefulness score compared to Before, while satisfaction remains low.
- **Late with**: The usefulness score continues to rise, and satisfaction shows a slight improvement.
- **After**: The usefulness score peaks, and satisfaction also increases, indicating improved perceptions after the intervention.

This data suggests that the intervention led to a positive change in both usefulness and satisfaction, with the greatest improvements occurring after the intervention.
Mean intention to speed

- At start of trial
- At end of with ISA period
- At end of after period
Impact Prediction
Method for estimating accident reductions with ISA

• Based on models from the literature relating speed to crash risk (e.g. Kloeden et al., 2001, 2002)

• These models have been calculated from real-world data

• *They are not drawn from the police reported contributory factors for accidents*
Estimated Reduction in Injury Accidents for Vehicles with ISA

<table>
<thead>
<tr>
<th>ISA Variant</th>
<th>Reduction</th>
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<tbody>
<tr>
<td>Advisory ISA</td>
<td>−2.7%</td>
</tr>
<tr>
<td>Assisting (Overridable) ISA</td>
<td>−12.0%</td>
</tr>
<tr>
<td>Assisting (Non-Overridable) ISA</td>
<td>−28.9%</td>
</tr>
</tbody>
</table>

= −50% for fatal crashes
What is the importance of regulation?
GB accidents saved over time for under the Market Driven scenario
GB accidents saved over time for the Authority Driven scenario

- Fatal
- Serious
- Slight
Comparison of predicted outcomes

GB Crashes Saved from, 2010 to 2070

<table>
<thead>
<tr>
<th></th>
<th>Slight Crashes</th>
<th>Serious Crashes</th>
<th>Fatal Crashes</th>
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<tbody>
<tr>
<td>Market Driven</td>
<td>4%</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Authority Driven</td>
<td>15%</td>
<td>25%</td>
<td>30%</td>
</tr>
</tbody>
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- Benefit to cost ratios (accidents + fuel + CO$_2$):
  - Market Driven scenario 3.4
  - Authority Driven scenario 7.4
Interpretation of scenario analysis

- Both scenarios are winners
- The harder the push for ISA and the “stronger” the system, the greater the benefits
- Shows the importance of regulation
- Much of the potential of ISA, e.g. to replace traditional and costly traffic calming, was not counted
Vaa et al. (2014) examined the safety potential for Norway of a number of driver assistance systems, including Adaptive Cruise Control, alcolocks, seatbelt reminders, Electronic Stability Control and fatigue warning.

Their conclusion was:

“The most effective driver support system is ISA.”
Conclusions

• ISA is a well-proven technology with very significant safety benefits

• Regulation is necessary to maximise the impact of ISA on European traffic injuries and deaths

• It is therefore logical to:
  1. Adopt legislation for fitting of all new commercial vehicles with assisting ISA systems in line with the recommendations of the evaluation study conducted on behalf of the European Commission
  2. Adopt European legislation for fitting of all new passenger cars with an overridable assisting ISA system
Thank you for your attention!
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FITTING SAFETY AS STANDARD

European Parliament, Brussels
3 November 2014

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FITTING SAFETY AS STANDARD

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