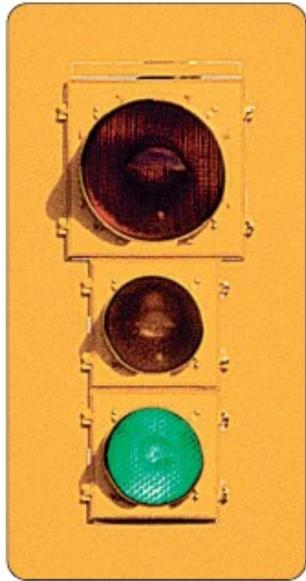


# **Making Canadian Roads Safer - with 20-20 Vision?**

Alan German, PhD CPhys



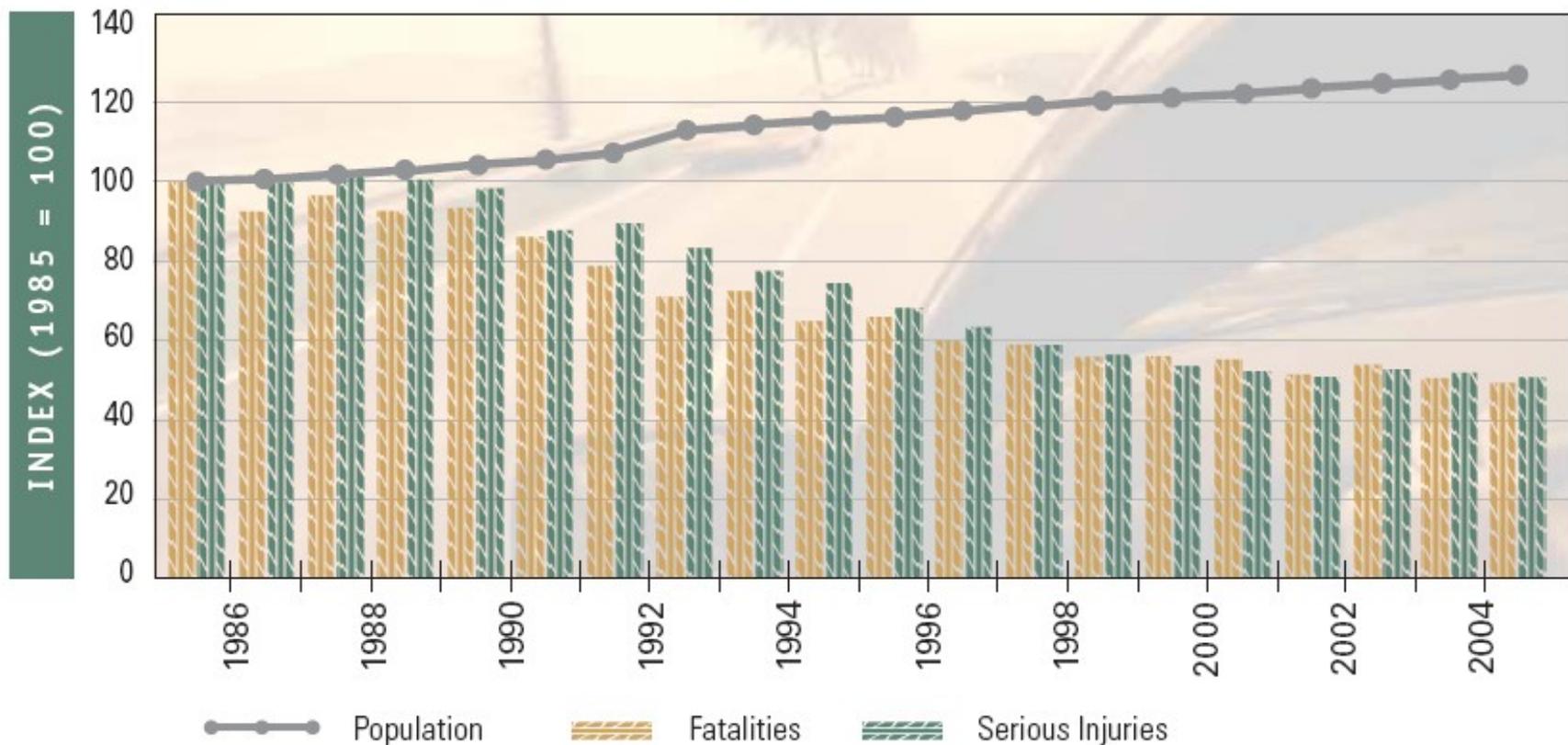
ROAD SAFETY VISION

2010

Making Canada's Roads the Safest in the World

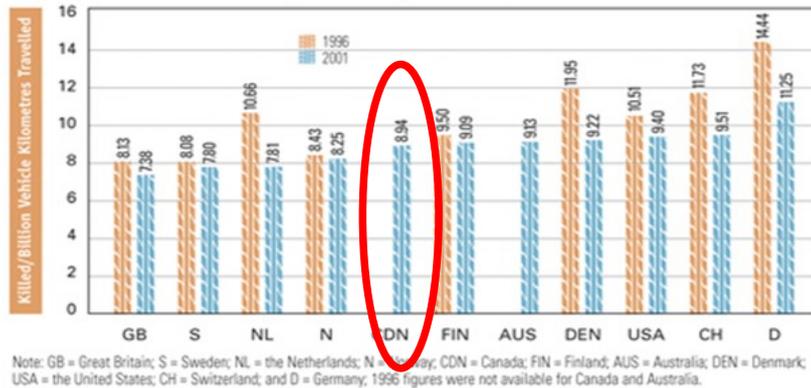
# There's good news...

Canada's roadways are becoming progressively safer despite steady growth in population, vehicles and drivers numbers



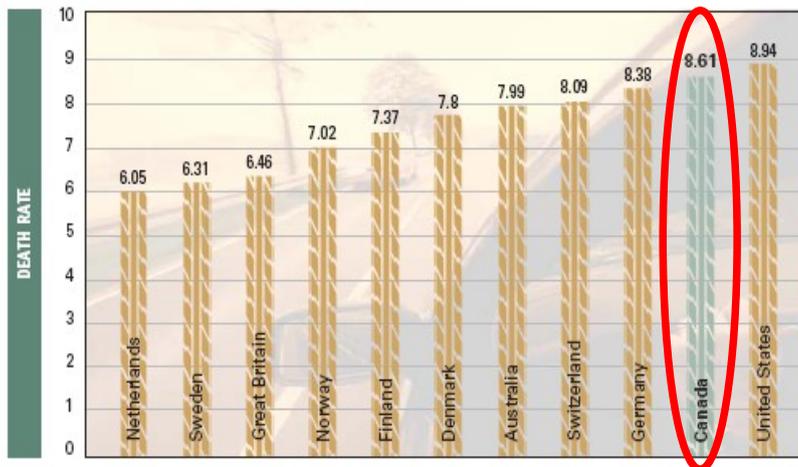
# And, not so good news...

The leading OECD member countries continue to raise the bar as annual fatality rates gradually decrease



In 2001, Canada ranked 5<sup>th</sup> in annual fatality rates amongst OECD countries

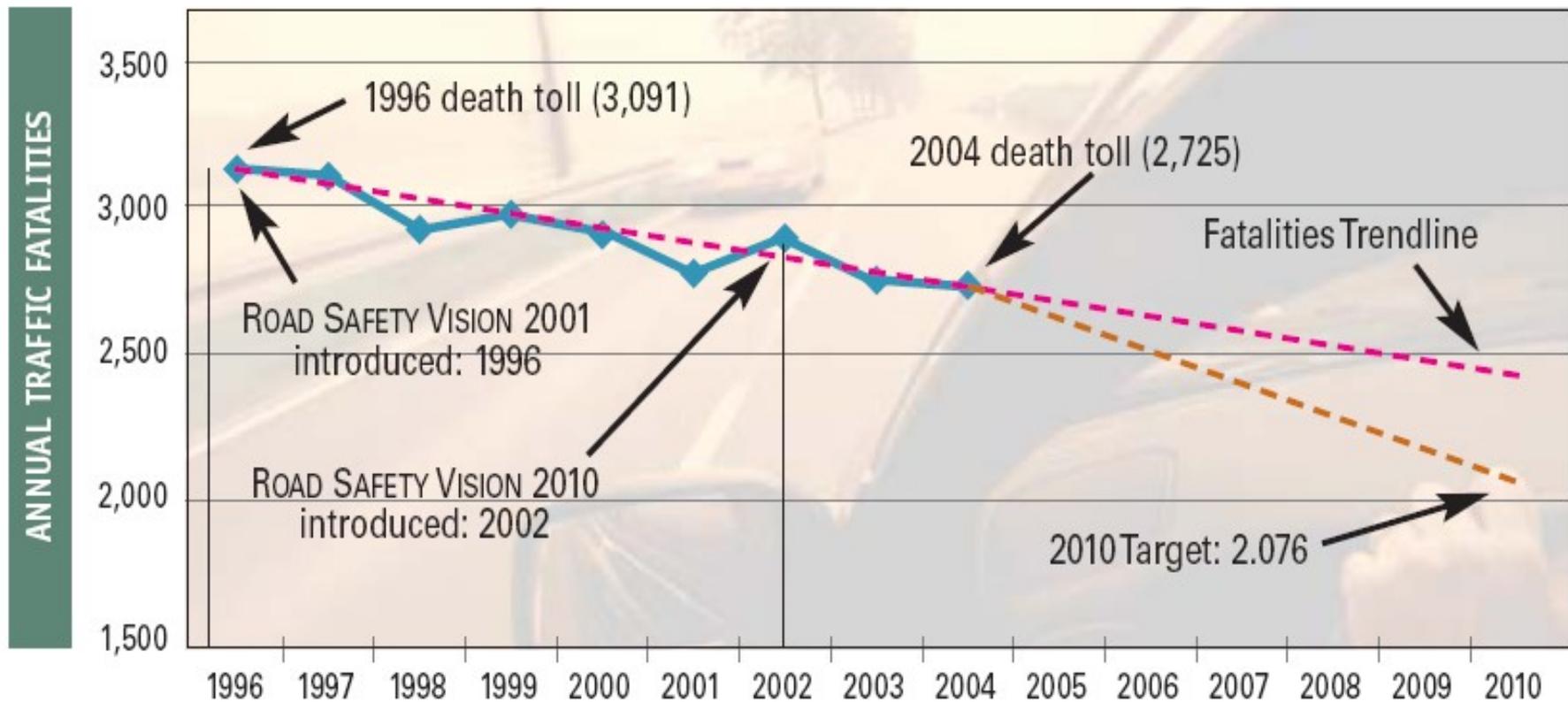
Death Rate per Billion Vehicle Kilometres Travelled, Top Ranked OECD Countries, 2004



In 2004, Canada ranked 10th!

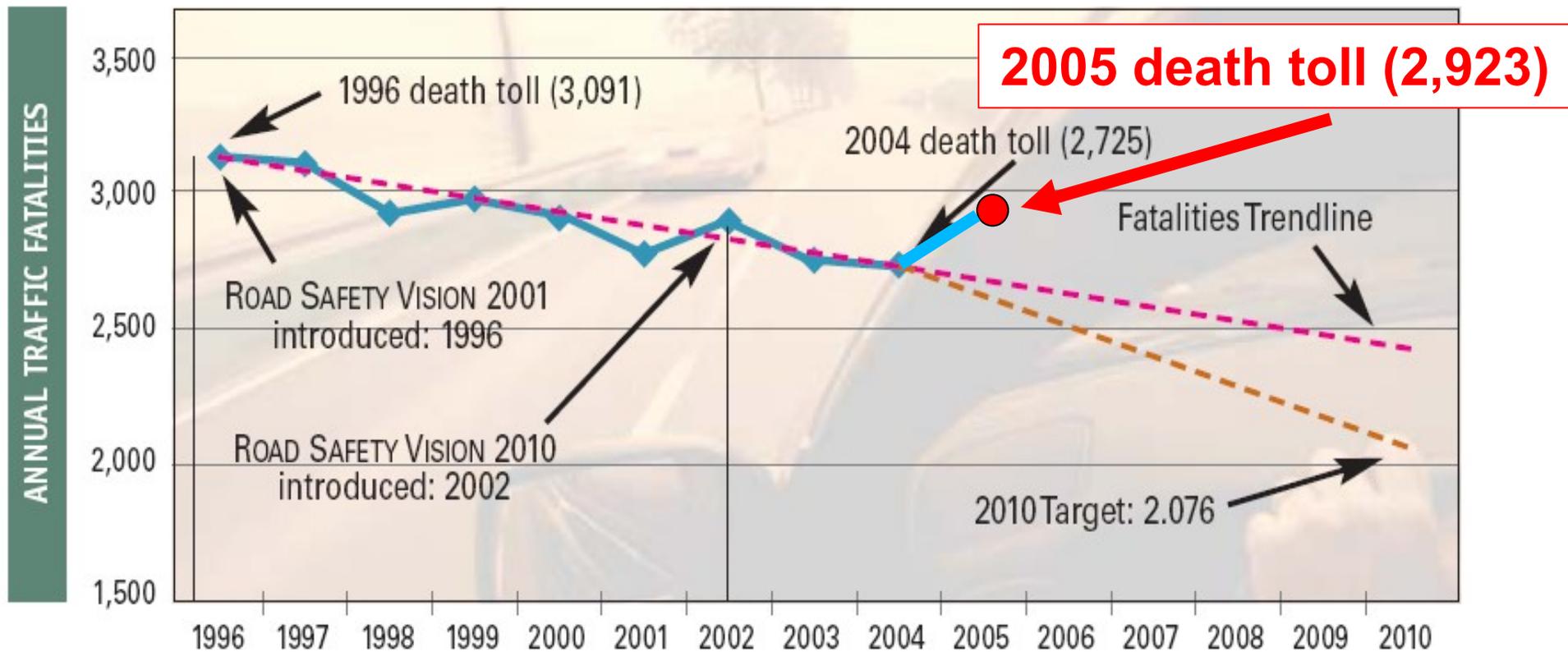
# There may be bad news...

## Canadian Traffic Fatality Projections to 2010



# And, perhaps even worse news...

## Canadian Traffic Fatality Projections to 2010



**So, what's wrong with this picture?**



# **So, what's wrong with this picture?**



**17-year-old driver**  
**Alcohol-impaired**  
**Traces of cannabis**  
**Unrestrained**  
**Loss of control**  
**Ran off roadway**  
**Rollover**  
**Complete ejection**  
**Fatal head and**  
**chest injuries**

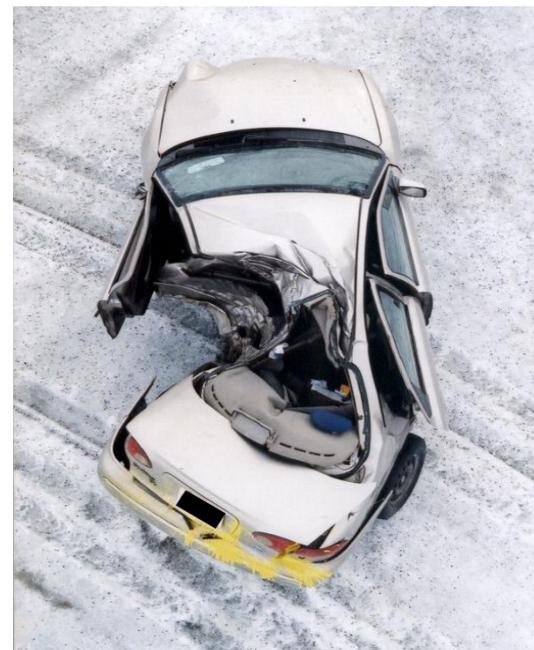
# **Causes of Fatal Collisions Pilot Study**

- **Transport Canada initiative**
- **Partnering agencies**
- **Causal factors**  
**(and injury mechanisms)**

*Multidisciplinary Study of the Causes of Fatal Collisions;  
Boase P, Belluz L, Burns P, Comeau J-L, German A, Jonah B,  
Monk B, White J, Bowron D, Edens P, Kent G and McCallum A;  
Proc. CMRSC-XVI; Winnipeg, Manitoba; June 11-14 2006*

# Cocktail party!

- **Driver, 20-yr-M, unrestrained, major injury**
- **RF passenger, 20-yr-M, lap/torso, fatally injured**
- **Alcohol, cocaine, crack cocaine, methamphetamine, morphine, cannabis**
- **4 years – 7 offences,  
– 4 demerit points**
- **No insurance, wrong license plates**



# Drowsy driver



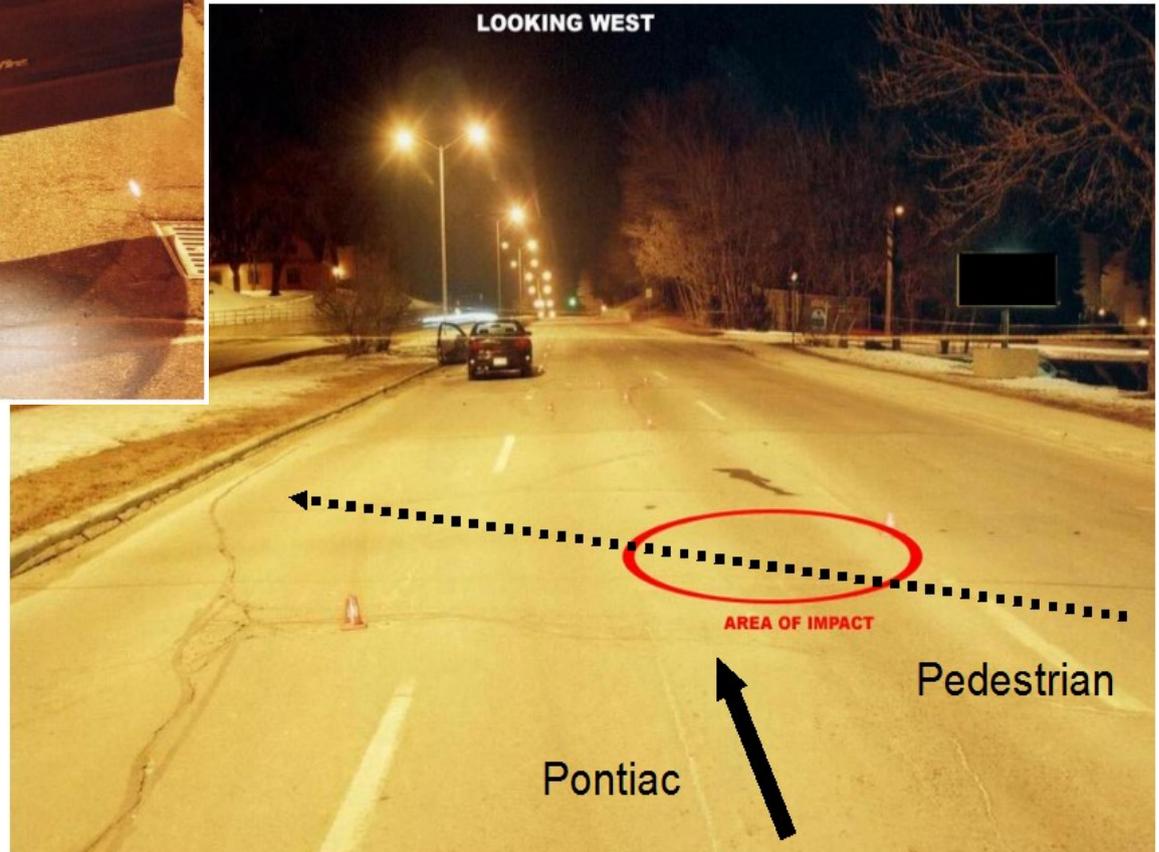
- 87-yr-M, driver
- Fully-restrained
- Fell asleep  
(RF passenger)
- Ran-off roadway
- Over-steered
- Rollover
- Closed head injuries  
(no head curtain)



# Inattention all round



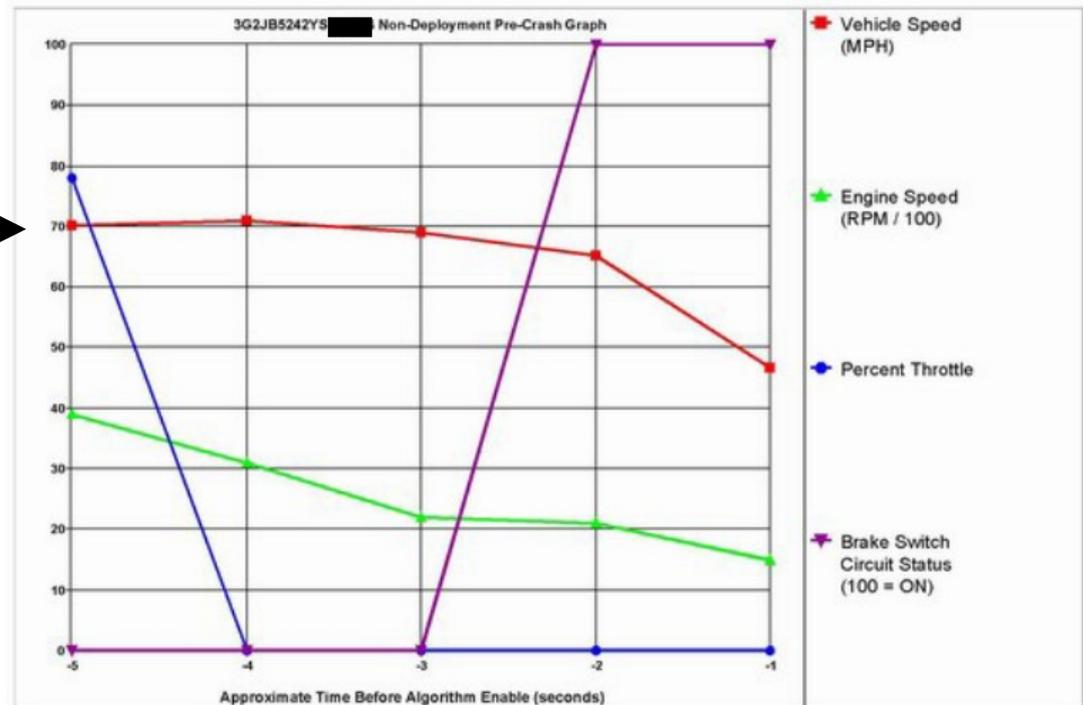
# Pedestrian fatality



# Pedestrian fatality

112 km/h (70 mph)

- 42-yr-M pedestrian
- 2000 Pontiac Sunfire
- 46-yr-M driver
- 158 mg%
- 60 km/h speed limit



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	70	3904	78	OFF
-4	71	3136	0	OFF
-3	69	2240	0	OFF
-2	65	2112	0	ON
-1	47	1472	0	ON

# Causes of Fatal Collisions Pilot Study

	CAUSES		%		
	Inattention	15	47		
	Alcohol, Drugs	11	34		
	Oversteered	7	22		
	Speed	7	22		
	Conspicuity	5	16		
	Unrestrained	4	13		
	Weather	3	9		
	Vehicle type	2	6		
	Fatigue	1	3		
	Inexperience	1	3		

# **Bottom Line**

The essential  
problem is one of  
driver behaviour

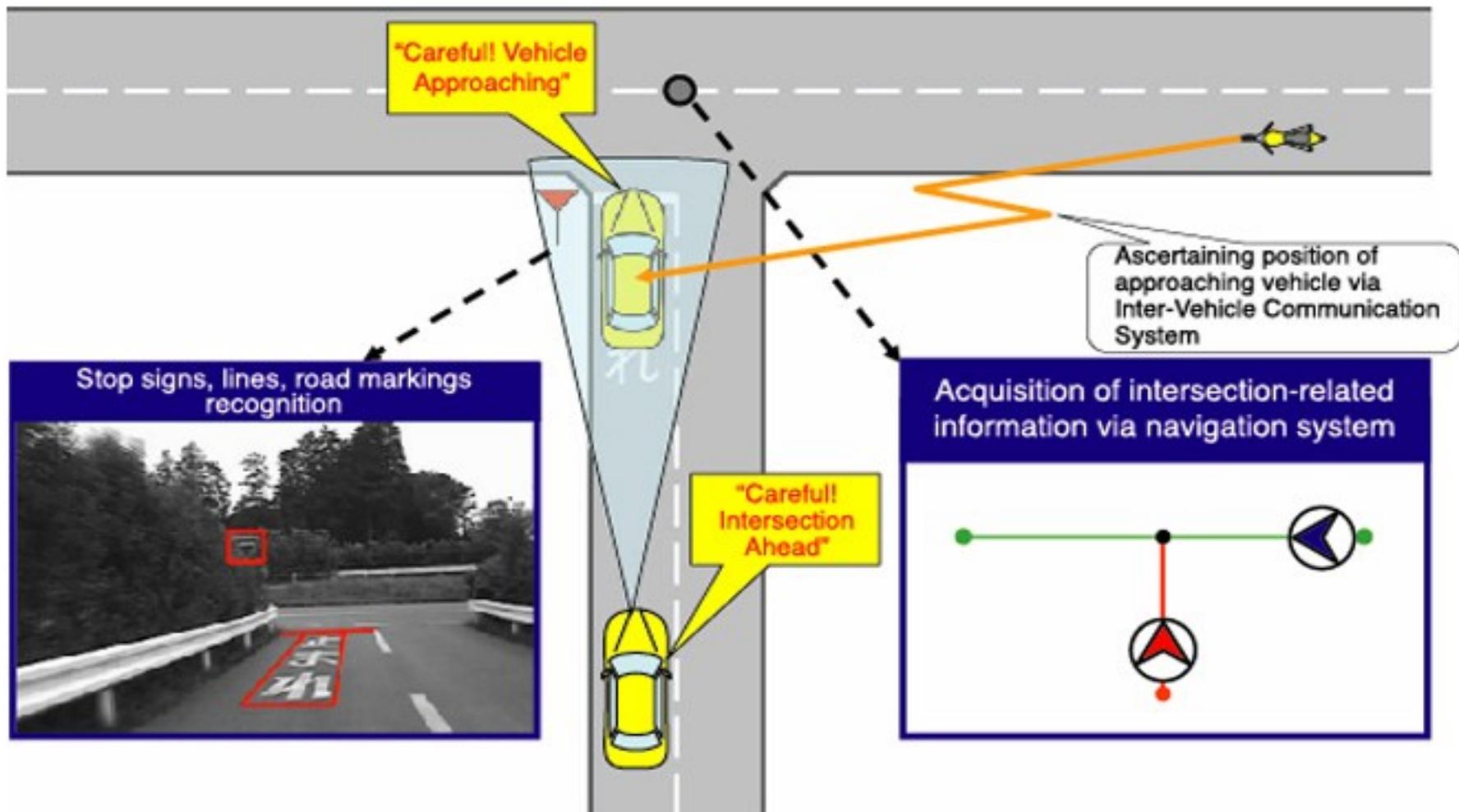
# Nothing new under the sun!

- John Treat et al., Indiana University, 1979
- Tri-level Study of the Causes of Traffic Accidents
  - 13,568 police reports (Level A)
  - 2,258 on-site investigations (Level B)
  - 420 in-depth investigations (Level C)
- Causation
  - 93% - human factors
  - 12% - vehicle factors
  - 34% - environmental factors

# **Vehicle-based Countermeasures**

- **Electronic stability control**
- **Brake assist**
- **Speed-control systems**
- **Adaptive cruise control**
- **On-board alcohol detection**
- **Event data recorders**
- **Lane-departure/fatigue warning systems**
- **Imaging/GPS-data systems**

# Even Higher Hi-tech !



Intersection Stop & Go Assistance System(Automobile)

# **Do we have the right tools?**

- **Level of investment in safety?**
  - **Cost of collisions vs. cost of safety programmes**
  - **Return on investment**
- **Effective safety programmes?**
  - **Evaluation/studies**
- **Canadian vs international safety programmes**
  - **How do they do it?**
  - **Would the same work for us?**

# **Do we have the right tools?**

- **Public awareness?**
  - **The media isn't the (right) message!**
  - **Car advertisements focus on performance**
  - **Why don't we use Youtube?**

**Road Safety is Everyone's Responsibility**

**Are you part of the problem, or part of the solution ?**

# **A New Tool : e-Road Safety ?**

## *Canadian Road Safety Research Institute*

- **Virtual “institution”**
- **Network of university centres of excellence**
- **National think tank**
- **Distributed effort**
- **Review international programmes**
- **Evaluate Canadian safety programmes**
- **Synthesize best (and worst!) practices**
- **Compile and disseminate knowledge**

# **E-Road Safety ?**

- Interest ?
- Funding ?
- Commitment ?
- Action !

**Road Safety is Everyone's Responsibility**

**Are you doing your part ?**