



Effects of Swedish Traffic Safety Research 1971-2004

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About VINNOVA

Mission: to promote sustainable growth by financing RTD and developing effective innovation systems in the fields of technology, transport and working life

Annual budget: Around 195 million euros

Number of employees: Around 180 persons

Instruments: R&D prgms, Centres of Excellence, institutes, SME schemes, international cooperation and others

Number of programmes running : Around 50

International cooperation



Need for impact analyses

Policy makers need relevant information to underpin decision making

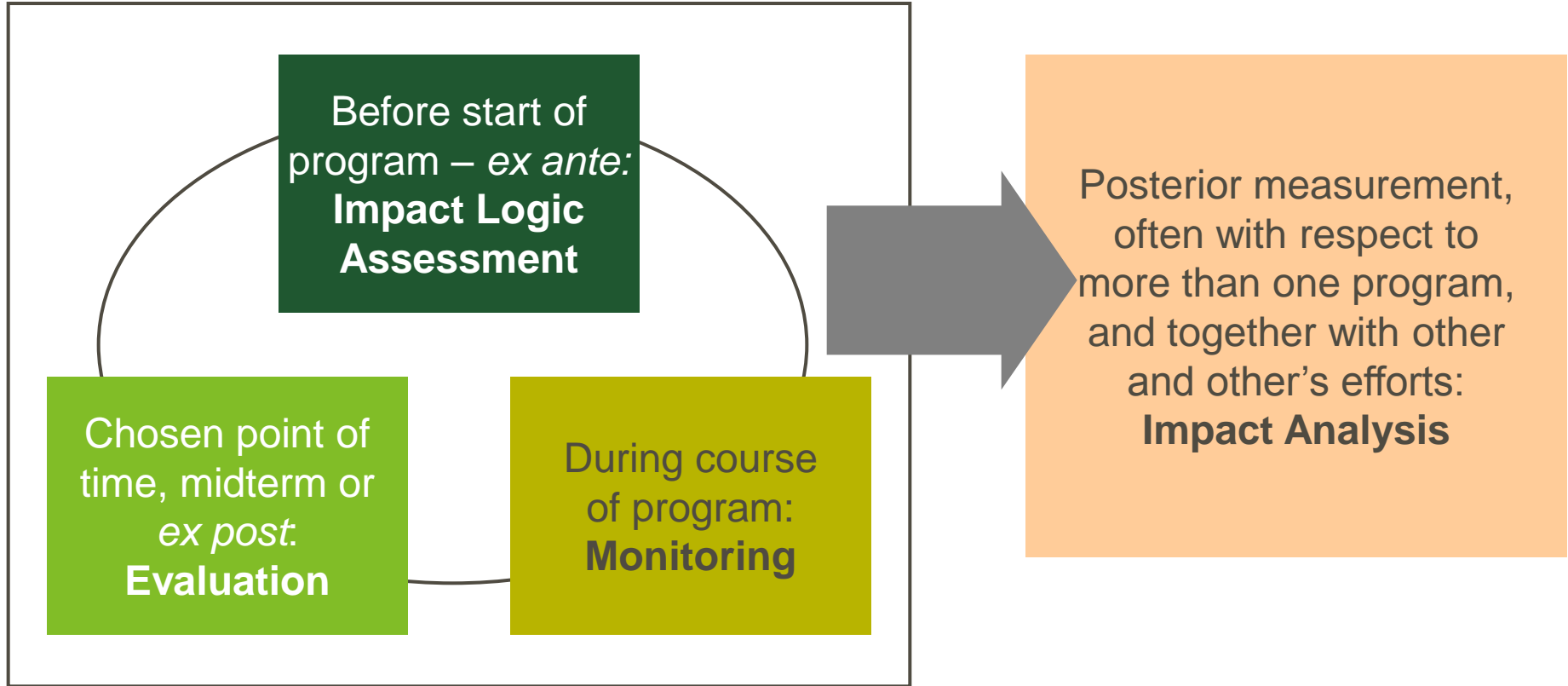
Often long delay before full effects of research are visible
Most ex post evaluations concluded shortly after end of programme

Consequence: Full effects of funded research not analysed

Ministry of Industry tells VINNOVA to perform impact analyses:
“to describe impacts that have resulted from VINNOVAs R&D-funding. Also comment on importance of used instruments for achieved impacts.”

Impact analysis – The context

Program





VINNOVA's impact analyses

4 pilot studies in 2001

6 impact analyses concluded

- Competence centre programme 1995 – 2003 8 years of perspective
- Impacts of neck injuries research 1985 – 2003 18 years
- User oriented ICT research 1982 – 1997 15 years
- Traffic safety research 1971 – 2004 33 years
- Role of R&D for Swedish mobile phone development 1975 - 2000 25 years
- Seed financing programmes 1992 – 2002 10 years

2 ongoing studies

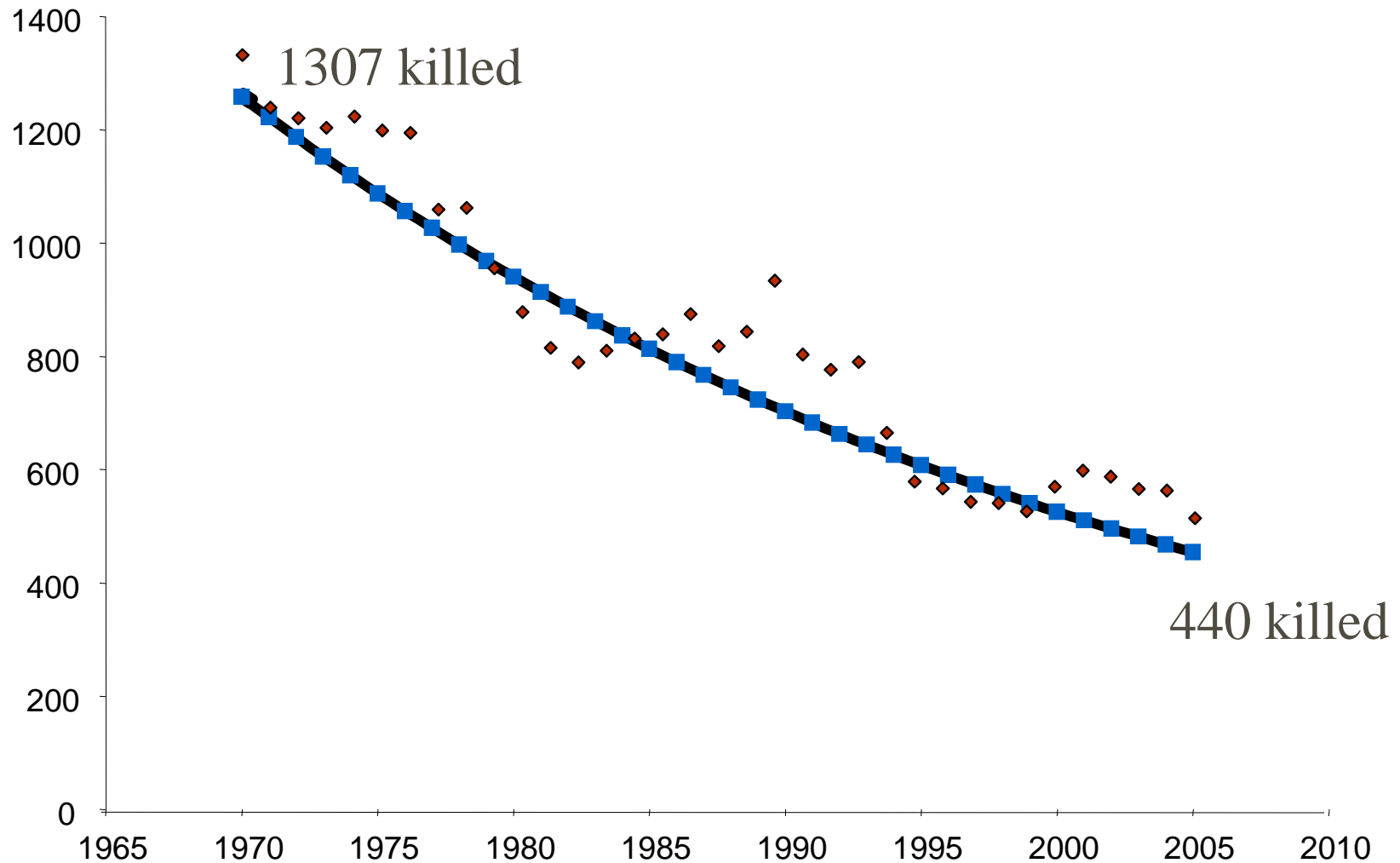
- Impact from research in life sciences
- Research and innovation in Industrial Sector Programs



Number of killed in traffic 1970 – 2004

Note. Traffic volume increased from 37 to 77 billion vehicle kilometres in same period (208 %).

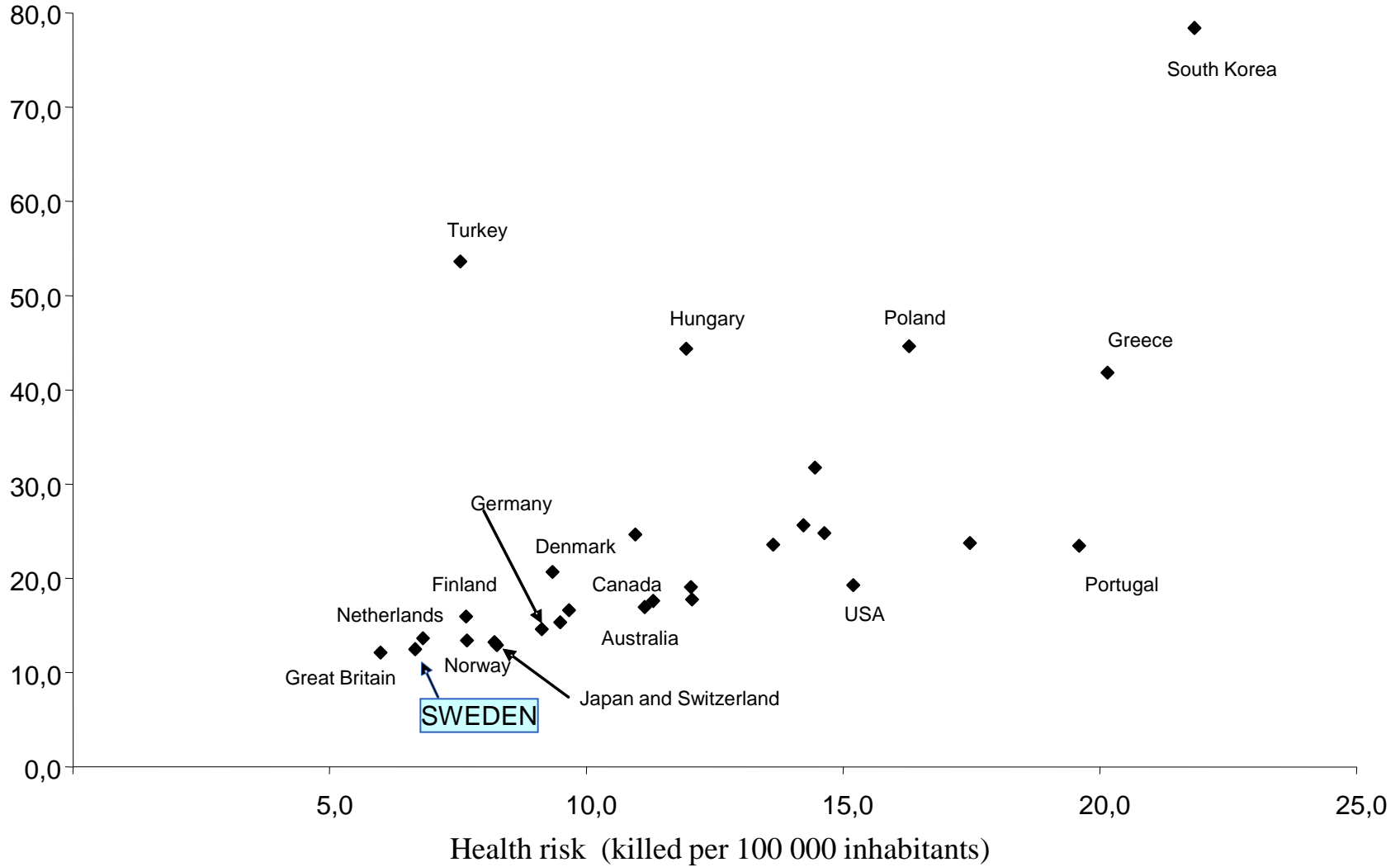
Number killed per year





Sweden successful as regards traffic safety

Traffic risk (killed per 100 000 vehicles)



Traffic accident costs in 2005

Degree of injury	Number in 2005	Costs per injury (M €)	Costs to society (M €)
Killed	440	1,90	840
Severe injuries	4 400	0,35	1 520
Injuries	44 000	0,02	840
Total			3 200

Note 1 – costs according to SIK A 2005

Note 2 – statistics re. number of injured is incomplete. For each killed, 10 are assumed to be severely injured and 100 to be injured.



Why impact analysis?

Concern for position of behavioural sciences research

Intuitive belief that funded research was successful, need to understand if this was true and in which ways it was successful



How analysis was implemented

Initially unclear how to arrange a successful analysis

Exploratory interviews

Advisory group – particularly informed individuals

Early conclusion – focus on people (not e.g. money or projects)

Overview of all Swedish research 1949 – 2005

Selected evaluator team

Field competence: Norwegian Institute of Transport Economics (TÖI)

Synthesis of 1600 research articles on traffic safety measures,
incl. to what degree measures were based on research

Evaluation competence: Professor Arild Hervik, University of Molde

Step by step approach – 3 successive contracts

Important inputs from advisory group



Four dominating research environments

- Department of Applied Road Safety, Chalmers Institute of Technology
 - Safety systems for vehicles such as whiplash injuries, air bags, safety belts
 - 6,5 M €, 34 projects
- Department of technology and society, Lund Institute for Technology
 - Research on traffic environment in urban areas
 - 5,0 M €, 62 projects
- Department of Psychology, University of Uppsala
 - Research on human behaviour in traffic
 - 5,2 M €, 54 projects
- Swedish National Road and Transport Research Institute (VTI)
 - Technologies for roads and vehicles, tests, traffic economy, driver training etc
 - 11,7 M €, 105 projects



Impact analysis on three levels

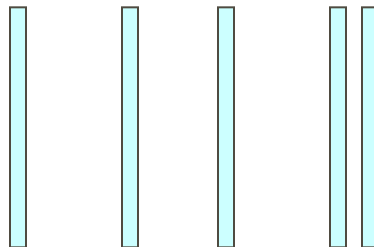
1973 – 2004
49 M €

VINNOVA 1971 – Council for Vehicle Research – ffp 1994 -	VTI institute	Sw Road Adminis- tration
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28 + 21 M €

C T H	L T H	U U	V T I	Others
6,5	5	5,2	11,7	21,2

Case studies



Year 2000 price level



Summary – impacts of traffic safety research

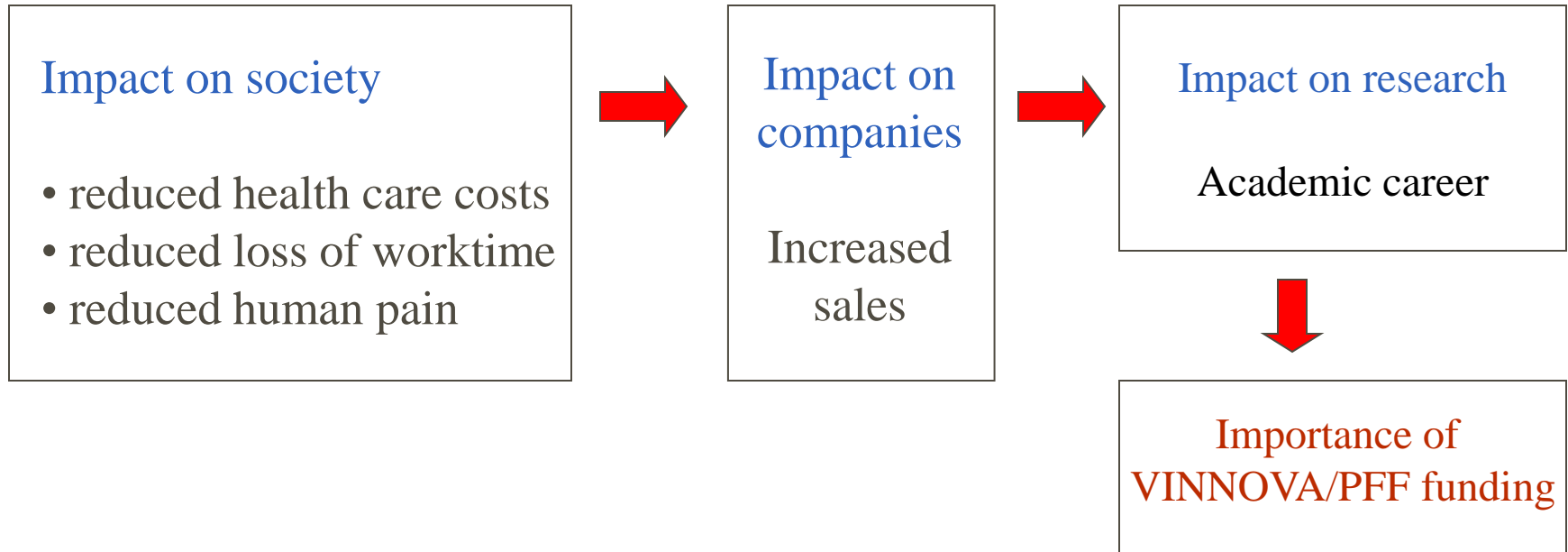
VINNOVA and Council for Vehicle Research have contributed to:

- 481 lives saved annually – at a value of 920 M € --
and many traffic related injuries prevented (at an even higher value – appr x2)
- Swedish automotive industry has developed a considerable number of safety related products, of importance to the industry's competitiveness
- Swedish research holds a high academic level in an international perspective
- Sweden has established university departments that trains qualified personnel in all domains of the traffic safety area – **a Good Research Circle**
- Effects on society's way of thinking, in Sweden and in Europe

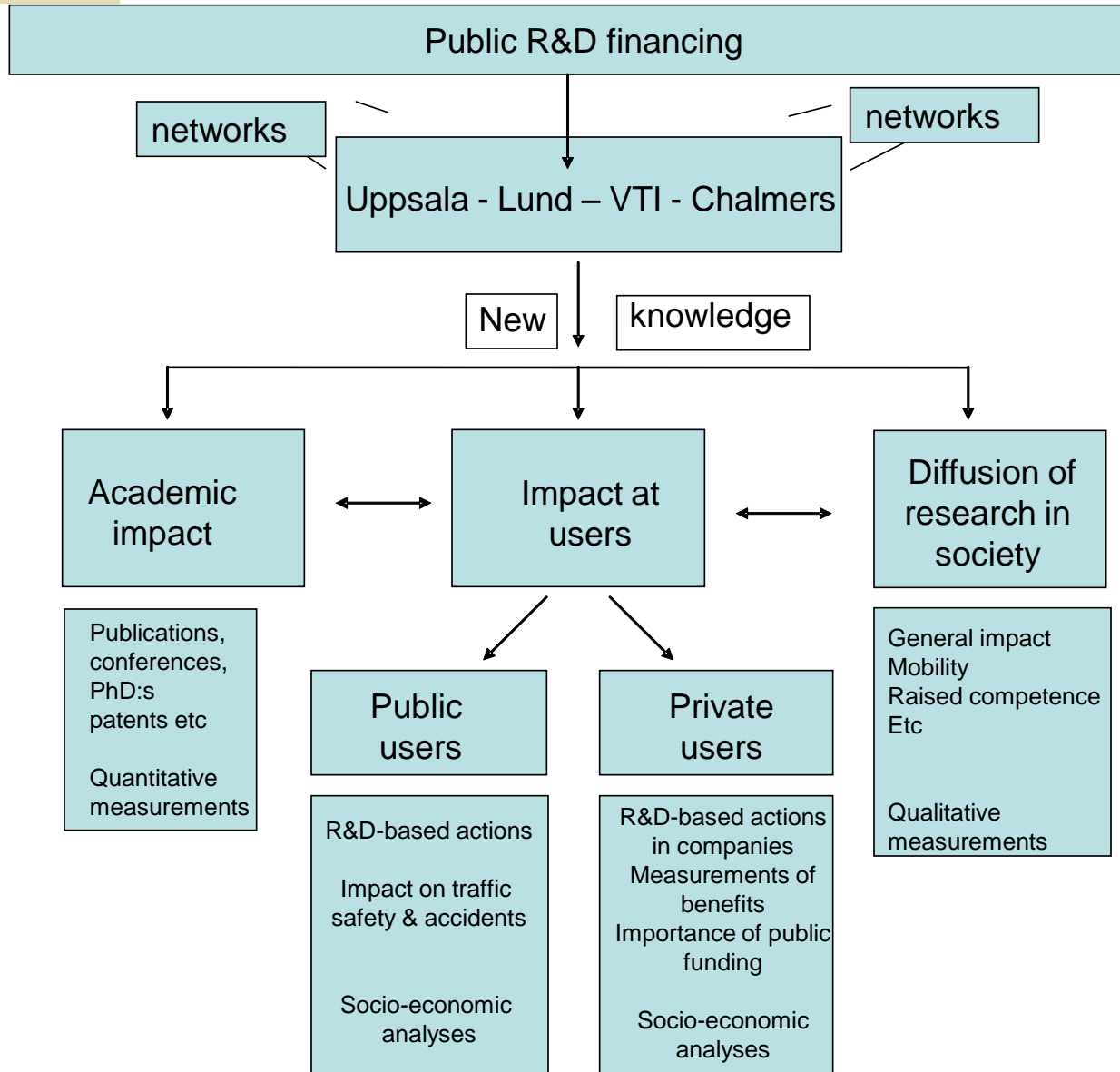
VINNOVAs and ffp:s financing crucial

Swedish Road Administration important in applying safety measures

Upstream approach



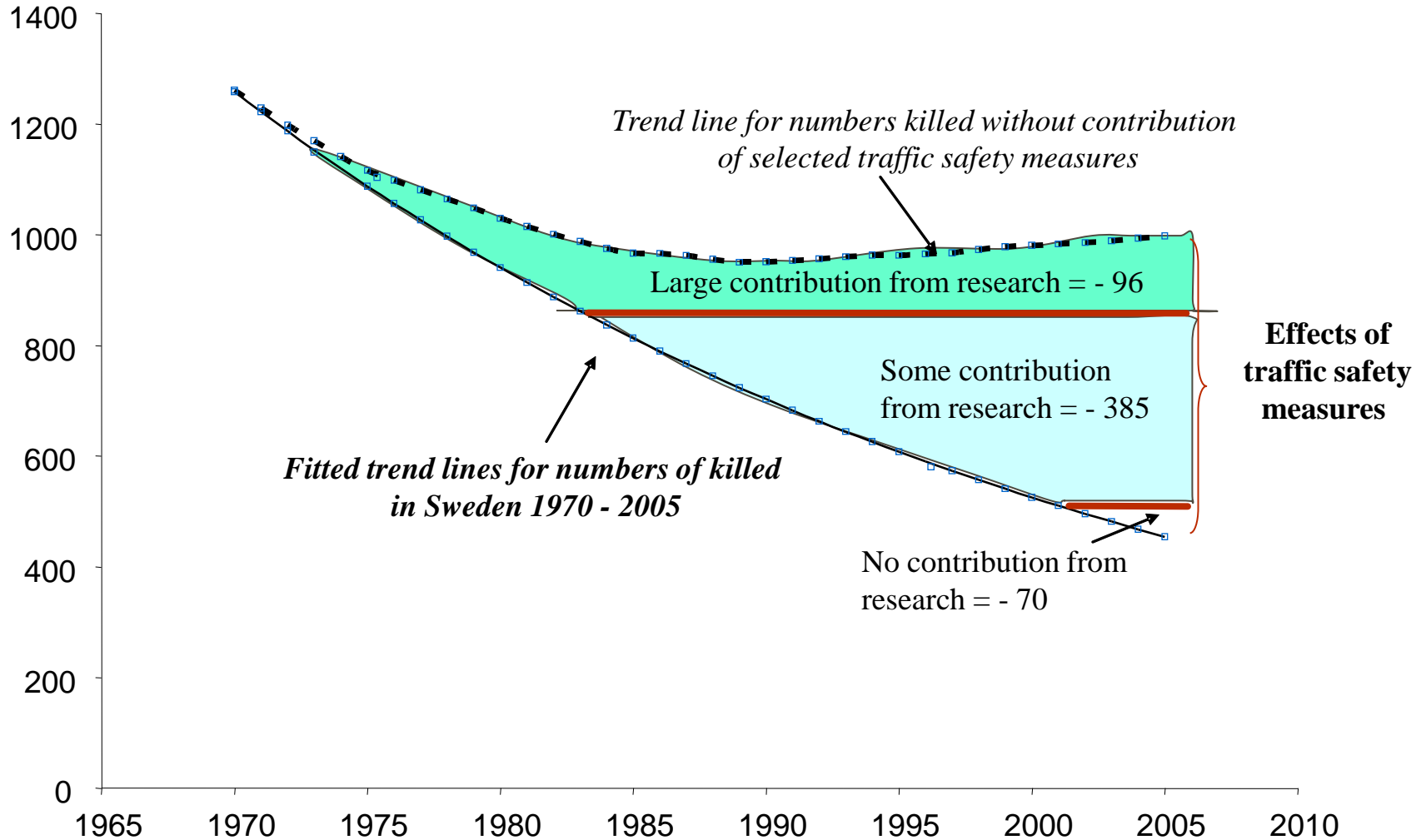
Effect chain model





Contribution from research to increased traffic safety

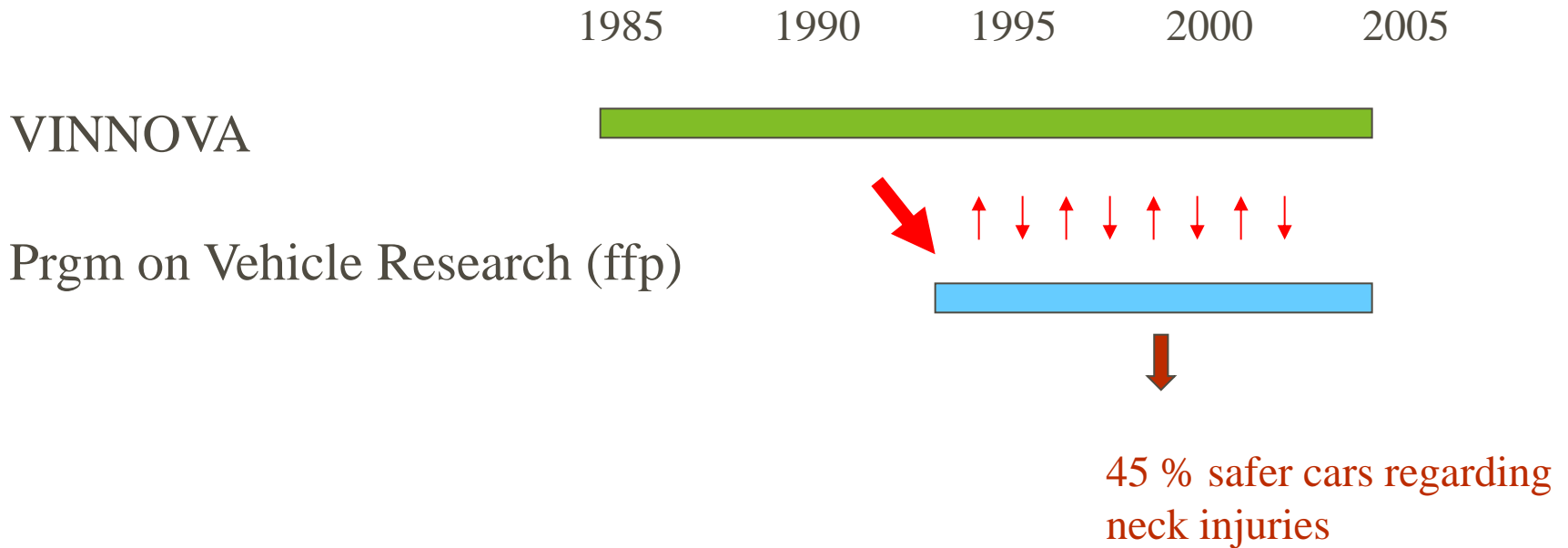
Number killed per year





Example – Neck injury research at Chalmers

Fruitful interplay research - industry





Network analysis

Insurance Institute
for Highway Safety

Swedish National
Road Administration

Swedish Defence
Research Agency

Folksam research

Sahlgrenska
hospital

VINNOVA

Autoliv

whiplash
research

Volvo

Chalmers

PFF

EU FP

SAAB

Auto & Motorsport -92
Euro NCAP



About whiplash injuries

Causes 65% of all disabling road traffic injuries

- 2000 p disabled annually
- 200 p early retreats annually, incl. younger persons

Injuring mechanisms still not fully understood

Occurs at low speed – e.g. peak hour accidents

Solution → find better vehicles – not a road environment issue

Worrying increase in number of injuries



Chalmers test equipment and applications - simple products based on advanced understanding

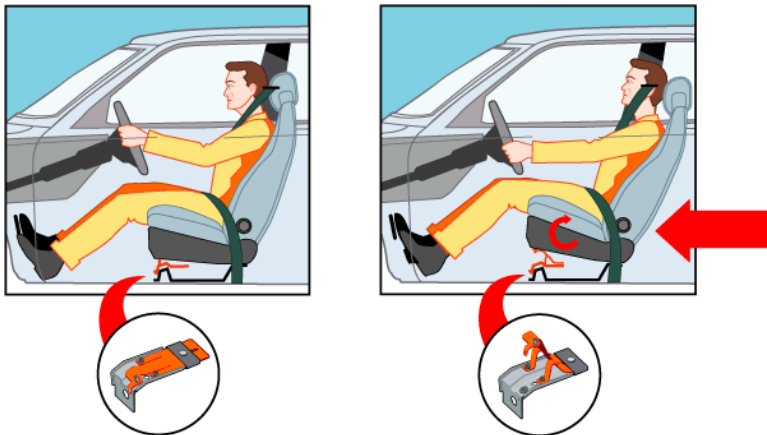


Chalmers BioRID test model



Autoliv/Volvo - WHIPS active whiplash protection

Autoliv's YSAB – system for cars already in use



SAAB SAHR-system





Impact - neck injury research

Socio-economic impact

Volvo & SAAB cars 1998 -
165 M € Sweden
(1800 M € USA)

Autoliv YSAB System
165 M €

Autoliv crash curtains
175 M €

Volvo SAAB 50% safer
Crash curtain 45%

Impact on safety standards

Impact on business

Increased sales due to
improved safety

SAAB, VOLVO
Autoliv

Crash curtain >1100 M
€ (90 % exports)

Centres of excellence
Ford and GM

Impact on research

World class research

Centre of excellence
GM



Conclusions

- Basic research initiated by an important societal need
- Multi-discipline research
- Mutual dialogue university research – industrial development
- Cluster within automotive industry marked by openness
- Condition for establishing research at Autoliv
- VINNOVA's grants crucial



Impact of analysis as such (as we understand it)

Policy level

Ministry of Industry - improved understanding of what VINNOVA produces - also in other areas than traffic safety

Strategic value - national consensus on traffic safety research.
Consensus that behavioural sciences research is important for entire system of traffic safety research.

Industry

They refer to the analysis. Important for location of GM and Fords safety research in Sweden.

Research

Instrumental for establishing SAFER research centre in Gothenburg
Feedback to researchers – their work has been important



Reflection on VINNOVA's impact analyses

They have been possible to do and they have been extremely useful

Most important – they give a broader and more nuanced picture of impacts that follow from VINNOVA's RTDI funding

Results have been positively received and easy to communicate at policy level

Analyses have been motivated by specific forward looking needs

Demands for competence (field, evaluation) higher than normal
-> limits which analyses may be possible to perform successfully

We have not seen academic research that focuses on full effects of R&D

We welcome information on similar analyses elsewhere



Reflection (cont.)

Have we chosen too simple success stories?

E.g. analysis on User oriented ICT research 1984 – 2005 have met difficulties measuring socio-economic impact (work life research difficult to measure)

Complements *ex post* evaluations – often concluded before impact is visible

Key factor to communicate results in a way that policy makers can understand



Reflection (cont.)

Should impact analyses regard particularly important issues?

E.g. ICT 1980 - 2005, biotechnology 1980 - 2005?

Or should we focus on mechanisms, instruments, how instruments complement each other?

How large studies are possible to manage?

Our impact analyses have been time consuming and fairly costly

They depend on availability of expertise – that policy makers will respect

Are they done elsewhere?