



Impact of ITS on clean multi-modal mobility

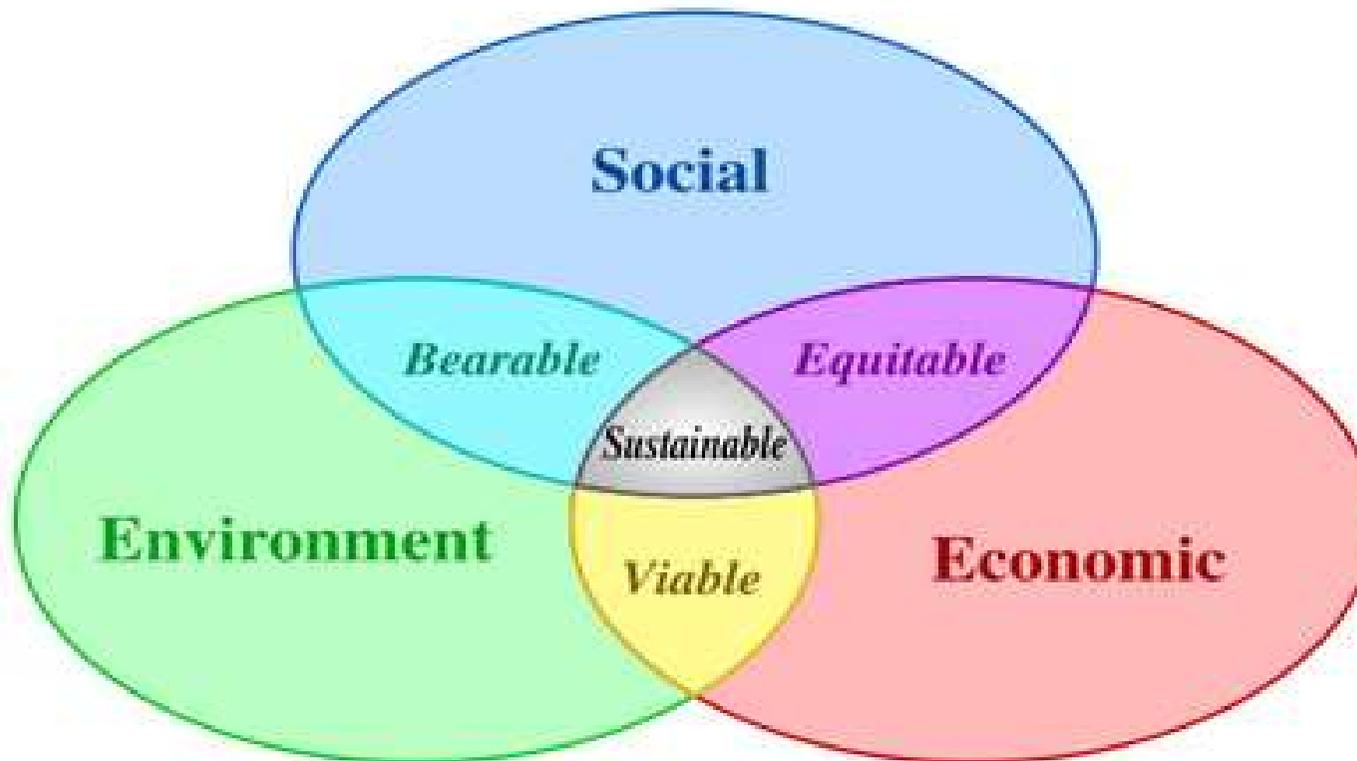
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What we will discuss



- What do we mean with “green”?
- Green driving: Driving in an environmentally friendly way
- Green mobility: Using environmentally friendly modes
- What are the potentials?
- Measures to achieve green driving & mobility
- Criteria and methods for evaluation of measures
- ITS that enhance green driving & mobility

Green is a part of Sustainability



Green driving



- Smooth driving style: Little braking, few accelerations, no top speeds etc. (definitions can be found in driving schools' papers)
- In the DECOMOBIL project description is added „aiming at improving vulnerable road users' (VRU) safety (better perception & detection of pedestrians, bicycles & PTW, automatic emergency braking, etc.) to increase safety feeling and reality of VRU, encouraging walking and cycling“
- The latter definition is going beyond „green“ towards the broader concept of sustainability



- Walking & cycling instead of using the car on short trips
- Using public transport in combination with walking and cycling on longer distances
- Exercising Park and ride, kiss and ride
- Car sharing, car pooling



Difficult to say for green driving. One example:

Spritsparpotenziale pro Jahr	Sprit- verbrauch	Kosten bei 1,40 Euro/Liter	CO ₂ - Emissionen
Mittelklasse, Benzin, 7,5 l / 100 km, 15.000 km p.a.	1.125 l	1.575 €	2.655 kg
Leichtlaufreifen und optimaler Reifendruck	-6 %	-95 €	-159 kg
Leichtlauföle	-4 %	-63 €	-106 kg
effizientes Fahrverhalten	-10 %	-158 €	-266 kg
Gesamtpotenzial	-19 %	-299 €	-504 kg
Alternative: effizienteres Auto (6 l / 100 km)	-20 %	-315 €	-531 kg

299 EURO SPAREN. Mit schonender Fahrweise und richtiger Bereifung sparen Fahrer eines Mittelklassewagens mehrere Hunderter im Jahr.

Quelle: Deutsche Energie-Agentur



- Difficult to say in CO2
- What can be said: ~50% of all car trips are shorter than 5km (= ~15 minutes by bicycle) and ~15% are shorter than 1km (= 10 to 15 minutes walking)

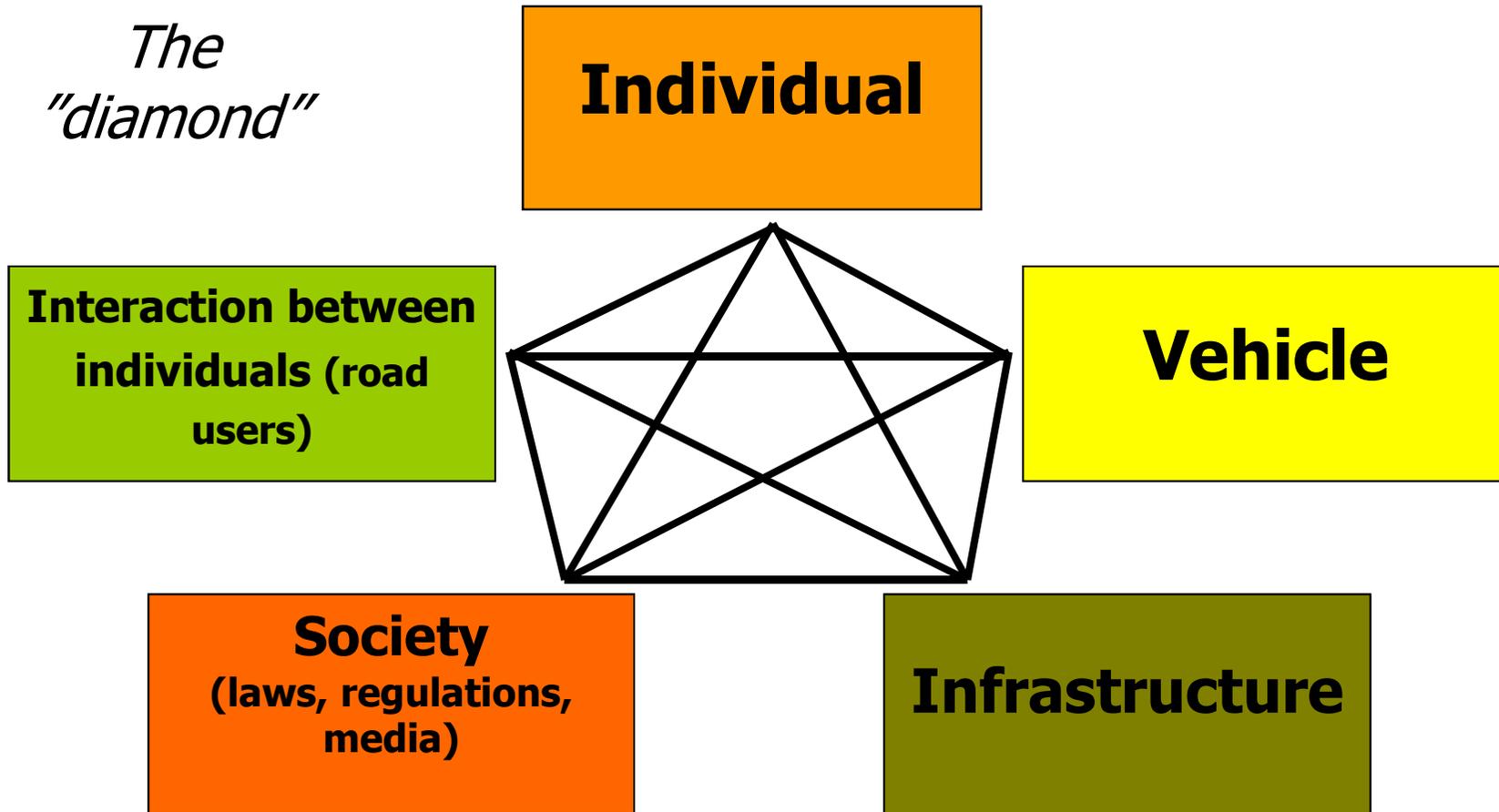


We can help to understand

- In which respect current behaviour deviates from certain societal goals
- Why this is so (how is current behaviour anchored)
- What wished-for behaviour does look like
- What the barriers there are for the wished-for behaviour
- What has to be done/what can be done in order to enhance the development of wished-for behaviour of individuals and of the public



*The
"diamond"*





- One thinks mainly of two fields:
 - Vehicle
 - Infrastructure
- However, a third field is most important: the individual
 - Driving style and mode choice are determined by individual characteristics

Individual „interference“



- Expectations, wishes, needs that a different kind of behaviour frustrates → attempts to avoid such behaviour
- Often certain behaviour has never been carried out → barriers exist due to one's imagination
- Prejudices make that the advantages of a certain behaviour are not seen or distorted

Involve the individual!



- If we want to achieve a certain behaviour the individual – or in any case the sceptical or reluctant individual - has to be convinced
- A way to convince is to make use of communication theory, in a more narrow sense: of the

Marketing model

Necessary steps



- Make people interested in sustainable transportation modes
- Provide appropriate preconditions
- Work on the side of the environment as well as with respect to usability, including intelligent technologies

Simplified marketing model



- **Information** about the target group: one has to know needs in order to satisfy them
- **"Products"**: provide applicable, attractive products → "concrete" things from thorough descriptions of wished for behaviour to assets for cycling
- **"Communication"**: arguments which meet the interest and acceptance of the target group(s)
- **"Incentives"**: possibilities to test a new product or try out a new behaviour and get a positive feedback thereby (extrinsic motivation should change to intrinsic motivation)
- **Distribution**: the placement of **P, C, I** in a way which provides a high possibility to come in contact with members of the target population

For good use by the individual



- To be used according to plans it should fulfill the 3 interrelated useability criteria:
 - Effectiveness: user should feel that what he/she does fulfills clear goals
 - Efficiency: is it easy/economic to behave in a certain way, can goals be achieved without exaggerated investment
 - Satisfaction: is the wished for behaviour comfortable, does it look good, does it feel well



- The social environment reacts to green driving
 - others press
 - others around do not adopt green driving style
 - green mobility is commented by friends
 - communication as a weaker road user with stronger ones
 - etc.
- → behaviour adaptation in non-wished for sense will be enhanced



- How topics are discussed publicly, what the media write, what is discussed in the pubs, what is said at home will have an influence on how one's behaviour develops
- Do those who are finally responsible for societal measures (laws, national research financing, etc) support research and measures that enhance green driving and green mobility?



- Perceptions & perceptual changes
- Attitudes and attitude changes
- Time-budget & changes
- Decisions & changes
- Behaviour & changes (operational, tactical, strategic)
- Life-style changes



- What & how strong
 - Sociological, systemical, individual changes
- ➔ How behaviour changes
 - On strategic - tactic - operational level
- Long term – to be discussed below



- OECD: “.. behaviours which may occur following .. introduction of changes to the road-vehicle-user [...] may create continuum of effects .. from .. increase ... to decrease in safety”
 - Not all-or-nothing but evolution
 - Depends on level of automation, interface design
 - System reliability & drivers’ trust
 - Task characteristic + social & cultural background
 - Individual driver characteristics
- Social-system adaptation?



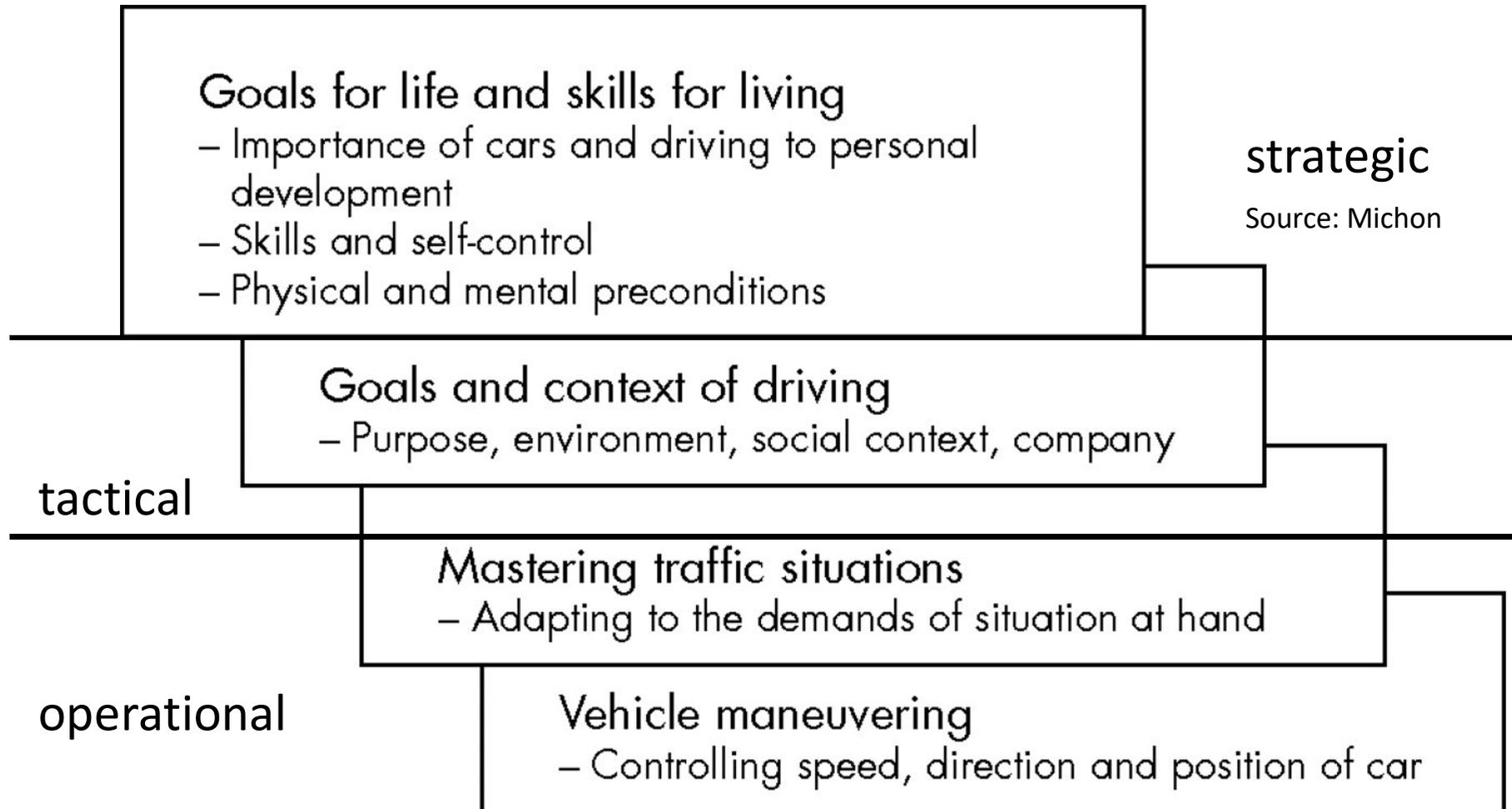
- Energetic/Regulatory processes
- Neurophysiology
- Higher cognitive processes
- Motivational processes
- Communication processes

Possible outcomes



- Wished-for behaviour vs. side effects
- Changed or new needs → wishes to fulfill them, obsolete needs → no more interest
- Person - society - groups - public space
- Special groups (elderly, early birds vs. late achievers)

Dimensions of behaviour



Source: Keskinen & Hatakka



Humanist

THANK YOU!

