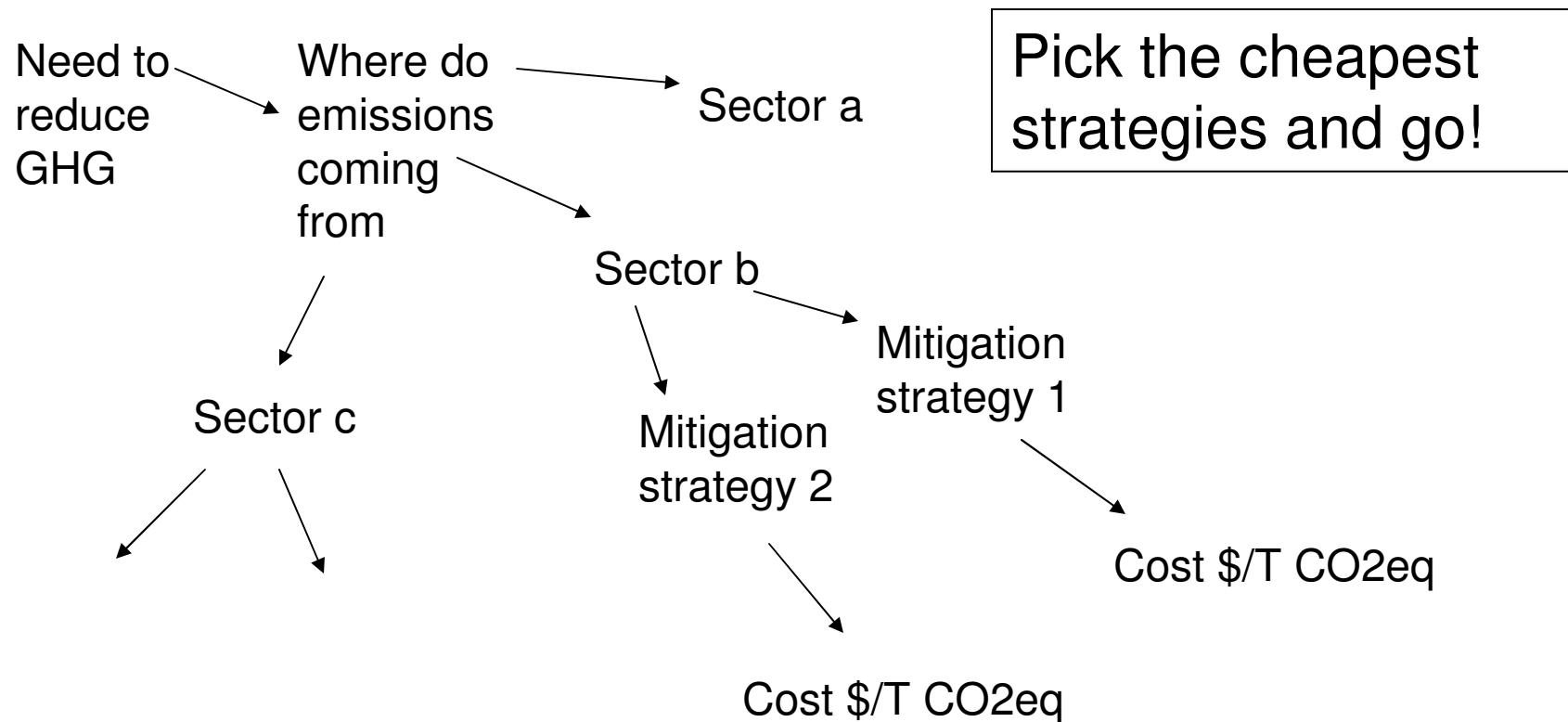


Appropriate measures for greenhouse gas reduction in the transport sector

Consideration of Synergies and
Considerations with other economic,
social and environmental issues

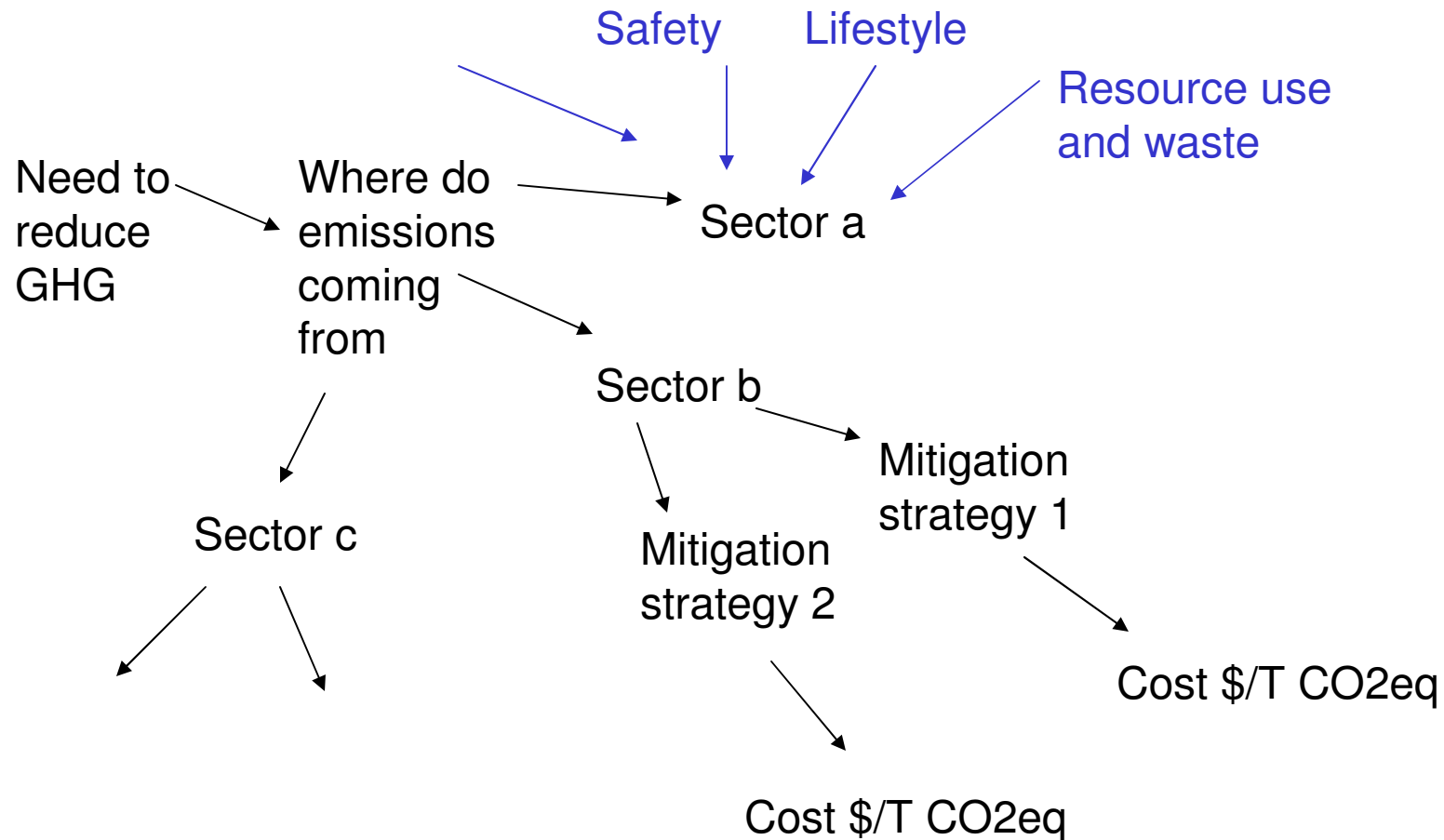
Greenhouse gas reduction



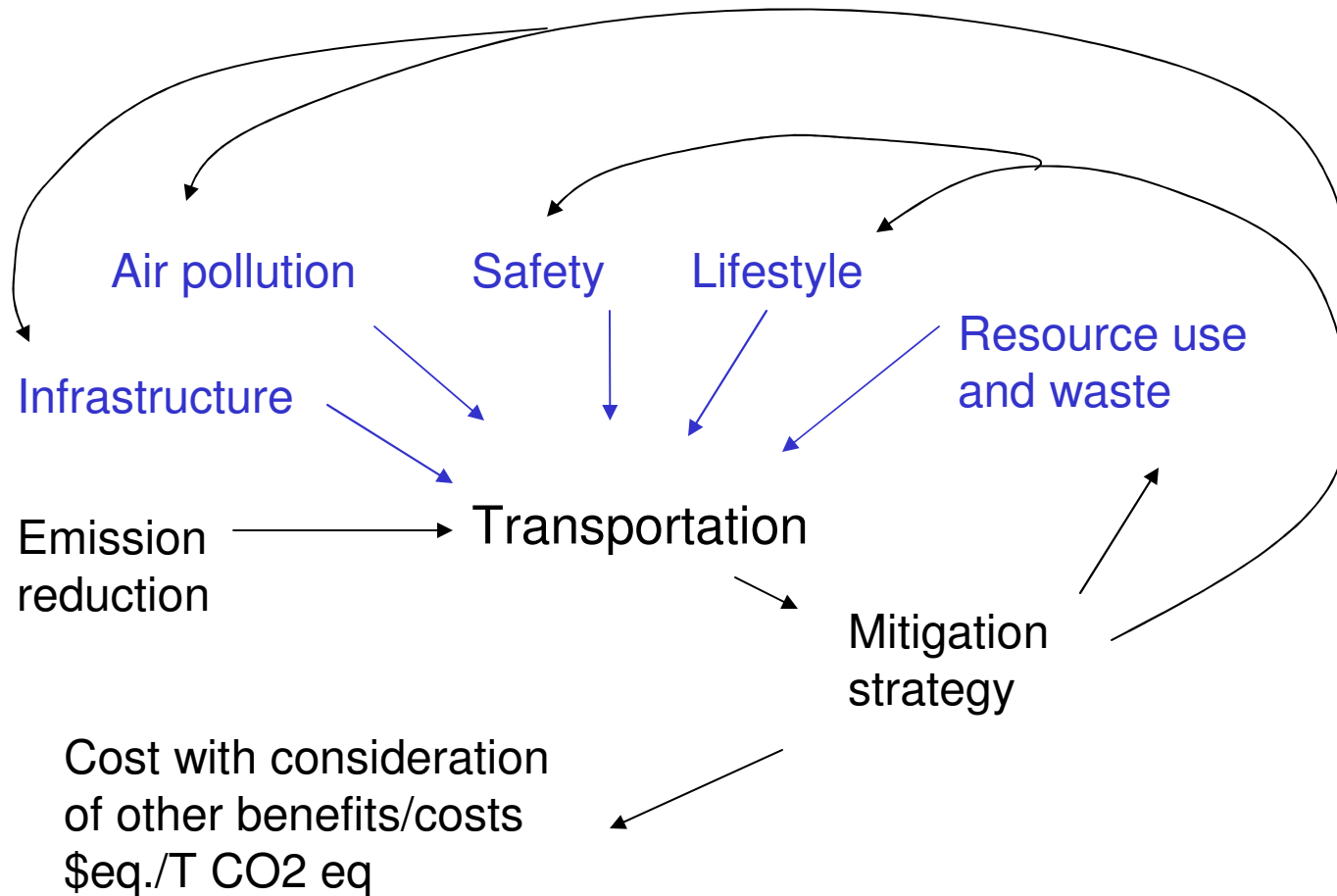
Transport loses out

- Technological improvements in conventional transport modes are expensive!!!!
 - Logistics of moving what power's you
 - Highly developed and refined automotive industry
 - Mobility as a symbol of freedom

But hang on, there are other issues



Mitigation strategy could affect these issues



What to do?

- Look at greenhouse gas reduction strategies – what we want to happen
- Examine policy instruments – how we are going to get it to happen
- Develop a tool to analyse the other impacts of transport under these strategies
- Incorporate these factors into GHG reduction strategy using a multi-criteria analysis method

Greenhouse gas reduction strategies

- Reduction in demand of mobility
- Modal shift
- Vehicle improvements
- Change in structure and organization of the urban transport regime

Different policy instruments

- Information and education
 - Ensure concerned public have appropriate awareness
 - Accessibility of information during decision-making (Kenyon and Lyons 2003),
 - Relevance of information
 - De-marketing cars (Wright and Egan 2000)
 - Reminding the public that they can change their habits – live locally and contain your zone of activities, use alternative modes etc.
- Financial aspect
 - Making public transport/cycling more financially attractive eg. tax-benefits
 - Decreasing tax-benefits for cars eg FBT
 - Increasing different costs of cars- vehicle, fuel, tolls, other running, other fees

Different instruments (cont.)

- **Flexibility**
 - Adapting aspects of our activity driven daily life for other means of transport
 - flexible working options, encourage working/schooling close to home, encourage approach to transport as not lost time but possible quality time – productive, fun, family, exercise, relaxation/meditation
- **Facilitation**
 - Making other options easier to use
 - Improving the infrastructure, payment, comfort, time use, databases
- **Regulation**
 - Forcing consideration of the sustainability of transport within companies, developments, institutions etc (Travel plans etc.)
 - Forcing more sustainable practices through standards, banning or indeed necessitating different transport regimes

Developing a tool

- Brainstorm what aspects influence different impacts in transport
- Research theoretical and empirical (city comparisons) influence of these aspects
- Possible need for data collection where appropriate information cannot be found
- Developing system of relationships and weights

Safety – possibility of crash

- Speed
- Manoeuvrability and Stability
- Road/track condition and hazards
- Perceived safety/risk
- Awareness
- Information Systems

Safety – crash damage

- Value of materials/property damaged
- Systems to fix/replace damaged material
- Protection devices (seat belts etc.)
- Absolute/Relative weights and sizes of vehicles
- Aggressivity and density of impact areas of vehicles
- Speed and acceleration at impact
- Nature of impact
- Emergency responses
- Ability for road network to re-establish operation after crash

Infrastructure

- Embodied energy of infrastructure
- Space requirements
- Effects on landscape
- Labour requirements

Lifestyle

- Enjoyment of travel
- Time/cost of travel
- Exposure to exchange/community
- Feeling of ability to access

Local Air Pollution

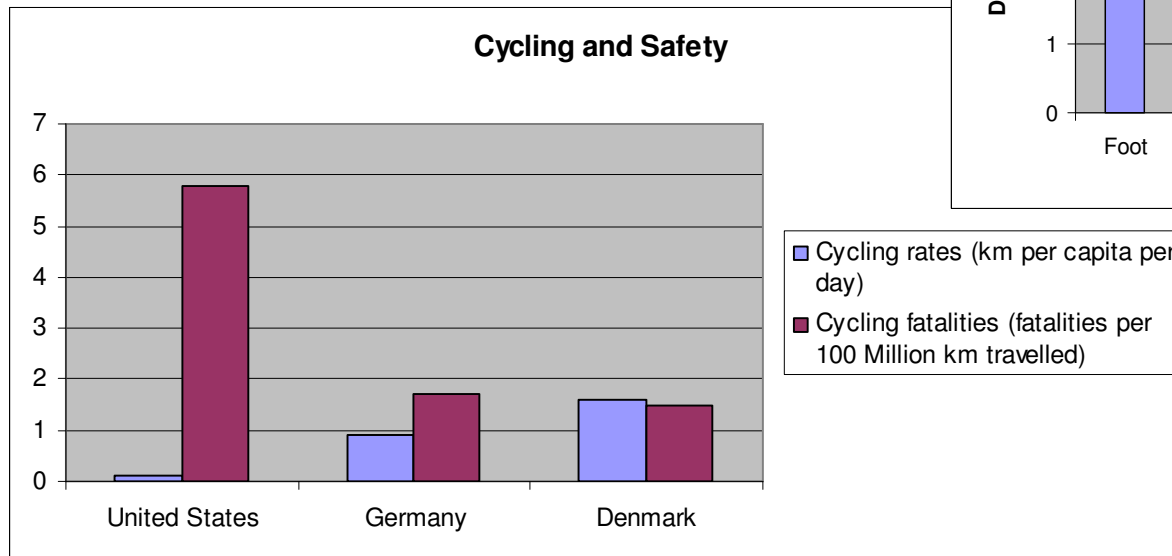
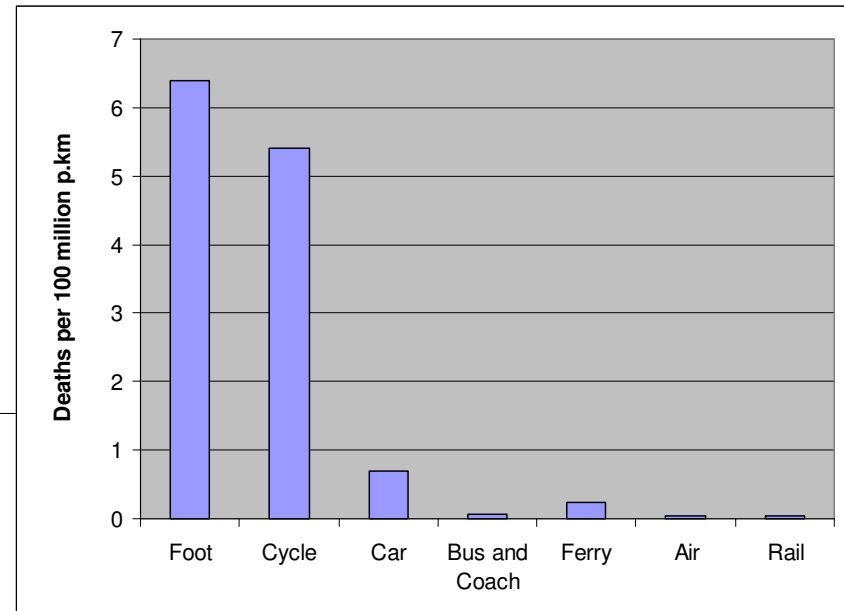
- Vehicle emissions
- Exposure of population
- Damage to infrastructure, structure and the natural environment

Resource use and waste

- Vehicle lifecycle
- Fuel lifecycle
- Other pollution from transport not yet considered

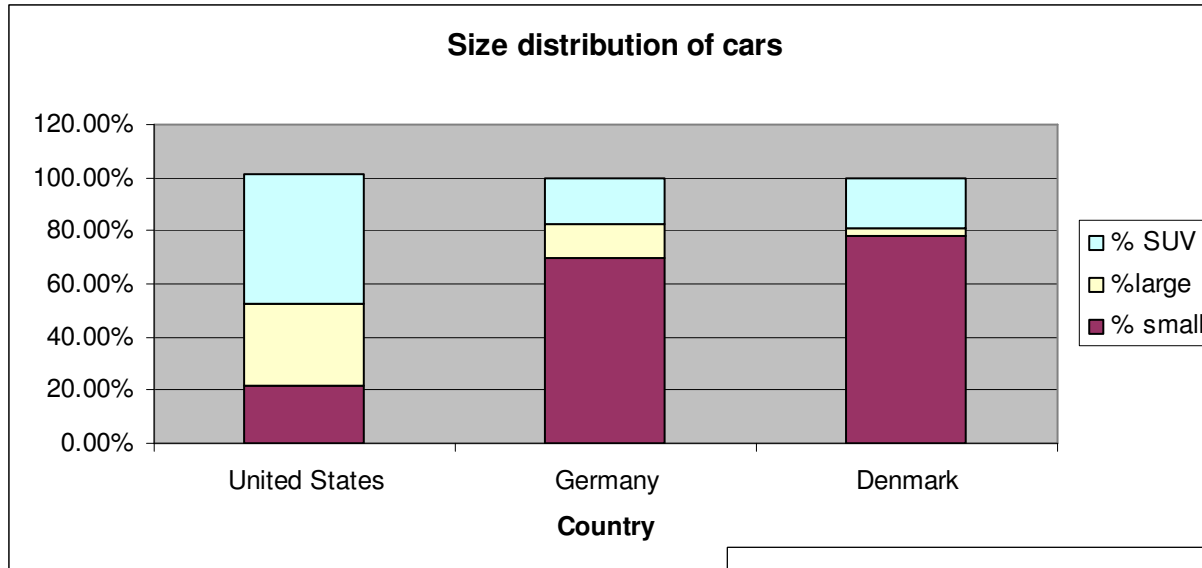
Research

- An example – Modal shift and safety
 - Shifting to a more vulnerable road-user (cycling)
 - Assess empirical data



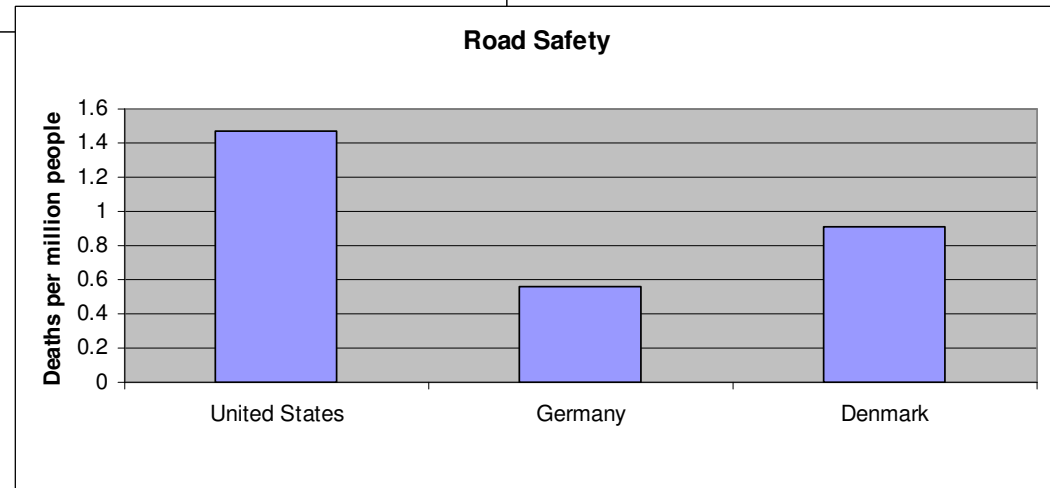
Cyclists are more vulnerable, but when there are more of them, they are safer

Other factors influence safety performance and cycling rates



Smaller cars
↘
More cyclists

Safer, calmer roads
↘
More cyclists



Research continued

- So it's not going to be simple.....
 - Develop block diagrams to show causes and effects of different aspects (brush up on my systems theory, matlab)
 - Develop matrices to demonstrate the weight of different aspects (veh. size, modal split etc.) on the categories of impacts (safety, air pollution etc)

Multicriteria Analysis

- “a methodology for evaluating options taking into account decision-makers’ multiple, and often conflicting, objectives...identifying its weaknesses and opportunities for improvement.”
- a tool to attack value laden decision problems
“decision problems that appear complex do so partly because of the presence of conflicting objectives” and “value laden decision problems should be structured by separating values from beliefs about facts”