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Decision support for sustainable transport planning

Traffic planning has for several decades been based on assumptions of continued growth in road traffic. At the same time, society has formulated sustainability goals that recurrently collide with traditional planning and decision making. Why is that? One theory is that today's models for analysis and methods for decision support are "path dependent" and in practice counteract sustainable urban development. Most likely, sustainable development requires a radical change of path. Would this change also require significant changes in the tools upon which analysis and methods for decision support are based?

The project, which took its starting point in the above question, has been run by a group of about 10 participants from universities, governmental, regional and municipal organizations. The project group has facilitated broad discussions about the role of tools, models and processes for decision support. The purpose of the discussions was to find ideas and issues for in depth studies

and seminars. Since the project team is closely connected to the Gothenburg region, the situational planning context in and around the Greater Gothenburg has consistently been used to concretize and exemplify the use of decision support in practice.

The project initially targeted governmental investments and the Swedish Transport Administration's guidelines for cost-benefit analyses. Discussions were held, for example, about the economic valuation of travel time, emissions and climate impact. Examples of questions raised were: why is travel time savings for car users valued higher than corresponding values for public transport? Or: why do increased carbon dioxide emissions have such a low impact on the outcomes of the cost-benefit analyses.

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Researchers, officials and consultants have been periodically involved in the project team discussions. In this way, a lot of questions have been answered and explained through discussions with initiated experts. In addition to meetings with experts and advisers, open seminars and small scale workshops have been held, with the aim of providing input to the project team, reaching out with the results, and to spread the group's discussions to a larger forum.

At two seminars, each with about 100 participants, experts, officials and politicians presented current topics focusing on the basis for decision-making and its role in the development of a sustainable transport system. The seminar participants were involved in discussions and given the opportunity to discuss and raise questions to each speaker in small groups. On two other occasions, workshops with targeted call were held to collect issues and to generate concrete proposals for the project team's work with the initiation and implementation of in depth studies.

The seminars, workshops and project group discussions resulted in the initiation of four in-depth studies.

The first study was an international review of cities that have implemented radical changes for a more sustainable transport system. In the second study the travel demand model used by the Swedish Transport Administration was tested on policy objectives for the development of public transport in the Gothenburg region. The third study focused on the role for decision support in the practical daily work through interviews with officials in the region and the municipality. The fourth study tested the use of time-diaries for individual households to assess how these can contribute to the understanding of individual obstacles and opportunities to travel less by car.

A general conclusion of the project is that the current system for cost-benefit analyses does not in itself constitute an obstacle to the transition to a sustainable transport system. On the contrary, cost-benefit analyses can be used within the framework of a sustainable transport system for weighing various measures against each other. Socio-economic profitability is also not the sole basis for investment decisions, but one of several aspects that politicians may choose to give priority to. The Swedish Transport Administration has developed a standardized template for decision support, the so-called "Overall Impact Assessment", where the socio-economic calculation is supplemented with qualitative analysis, assessment of transport policy fulfilment and analyses of distributional effects. Some aspects, however, need further development, including urban development and social sustainability.

Traffic forecasts are key inputs for national planning of transport investments. In one of the studies within the project, the Swedish Transport Administration's forecasting model Sampers was tested on modified assumptions and input data. The analyses show that an increased public transport share can be achieved with both improved public transport as well as measures for road traffic control such as parking fees or congestion charging. Traffic forecasts with reduced car traffic can thus be generated with existing tools. A sharp increase in public transport share in the Gothenburg region requires strong measures in the transport system. The change can be achieved through improved public transport, but in the 20-year term, the planned measures do not come close to the travel time reductions required. A high public transport share can thus only be achieved by reduced distances to activities combined with decreased car mobility.

Publications

(<https://www.mistraurbanfutures.org/en/project/wise-well-being-sustainable-cities>)

Mistra Urban Futures Rapport 2014:6 Omställning till 40 % kollektivtrafikandel i Göteborgsområdet - en backcastingstudie med Sampers, C Sandbreck, A Almroth

Mistra Urban Futures Rapport 2014:4 Tjänstemäns erfarenheter av beslutsunderlag för hållbara urbana transport-system. K Thoresson.

Seminarieunderlag Beslutsmodeller - Om beslutsmodeller och internationella erfarenheter för förändring av urban mobilitetsplanering. J Stål.

Mistra Urban Futures Rapport 2015:7 Är bilberoende och tidsbrist ett hinder för ökat kollektivtrafikresande? Berg, J., Karresand, H.

A regional scenario with a high public transport share has been developed based on: increased concentration of housing and workplaces, substantially higher parking fees and reduced car ownership. The scenario is used in regional and local planning, but implementation of the scenario on a national level of planning probably requires follow-up analyses of municipal plans and how they are following the scenario.

In summary this means that tools and methods that can be used to generate data for investment decisions towards a sustainable transport system is already at place, at least on a national level. However, current applications do not seem to focus on sustainable mobility. Officials interviewed in one of the project's sub-studies also experience that the link between the objectives of sustainable mobility and planning decisions is weak. Social sustainability is cited as particularly poorly illuminated by several interviewees.

Regardless of the choice of future scenarios, a development towards a sustainable transport system requires changes already in the current system. Planning of transport often takes a perspective based on trips instead of individuals, which means that the obstacles (in the form of, for example the everyday time use of individuals)

for travel by public transport is not visible. The so-called time-diaries analyzed in this project indicate that transition from car use towards public transport often requires that other activities are changed, for example meaning less time with friends and family or less time for sleep. Combinations of travel by car/bike/public transport, however, have greater potential to function in people's everyday life.

Seminars and project discussions have also brought forward the question of how ideas are generated and developed further. It is noted that the idea generation means more for planning and investment decisions than the socio-economic calculations and other associated assessments. Could it be that too few suggested projects with sustainable approaches are concretized and evaluated as investments? And how does this relate to the gap between the vision of sustainable cities and the everyday planning that some practitioners experience? Transport planning is today largely focused on solving problems. When the focus is directed towards the well-known current problems, such as congestion, accidents and emissions, instead of new performance-enhancing improvements, there is also a risk that very profitable ideas are not even assessed.

6 CONCLUSIONS

- 1. Analytical models and tools for decision support are subordinate, but necessary complements, to strong leadership and willingness to make change.**
- 2. There is a gap between the strategic visions and the everyday planning practice.**
- 3. The travel demand forecast model of the Swedish Transport Administration can handle scenarios that generate sustainable travel patterns, but input data is crucial for the results.**
- 4. A forecast scenario with a high public transport share can be created by combining increased concentration of housing and workplaces, an increase in parking fees and reduced car ownership.**
- 5. Analyses of activities and time use within a household, can broaden the basis for decisions towards a sustainable transport system.**
- 6. Proposed infrastructure projects are often defined early in the planning process. Selection and prioritization of projects to be considered in the formal planning process can thereby be more crucial than the tools and methods used in the subsequent assessment.**

Decision support for sustainable transport planning

1. Analytical models and tools for decision support are subordinate, but necessary complements, to strong leadership and willingness to make change.

International examples suggest that radical change towards sustainability in many cases is the result of a committed and courageous leadership. Decision support and models for analysis seem in this context to be subordinate. However, politically clear goals that are also reflected in the decision-making process, is a key ingredient for change along with long-term commitment among residents, key employees and officials.

2. There is a gap between the strategic visions and the everyday planning practice.

Officials interviewed within the project experience a disconnection between objectives of sustainable mobility and planning decisions and models. One may agree on strategic goals and documents, but different approaches may be visible in the more detailed decisions. Social sustainability is cited as particularly poorly illuminated by several interviewees.

3. The travel demand forecast model of the Swedish Transport Administration can handle scenarios that generate sustainable travel patterns, but input data is crucial for the results.

By changing the input of the travel demand forecasting model of the Swedish Transport Administration, scenarios with reduced road traffic can be generated. Tools, methods and models need to be developed to some extent but it is above all the application and assumptions about future costs, travel times and physical structures that determine the forecasting results and the magnitude of estimated impacts.

4. A forecast scenario for the Gothenburg region with a high public transport share can be created by combining: increased concentration of housing and workplaces, a sharp increase in parking fees, and reduced car ownership.

Explorative modelling using the forecast model of the Swedish Transport Administration show that a sharp increase in public transport share would

require strong measures in the transport system. Such a change can be achieved through improved public transport, but the currently planned actions in the coming 20 years do not come close to the travel time reductions needed. A high public transport share can thus only be achieved by a reduced distance to activities combined with decreased accessibility (such as increased parking fees) for car traffic.

5. Analyses of everyday activities and time use within a household, can broaden the basis for decisions towards a sustainable transport system.

A households' ability and willingness to use public transport is restricted due to activities that must take place during specific times of day and at specific locations such as work, school and child care. A swap from car driving to public transport may require other activities to change, which may, for example, mean less time with friends and family and less time for sleep. Combining public transport, biking and car may, however, work for several households. Highlighting the perspectives of individuals and households by describing the time use of everyday activities has a great potential to enrich the decision support for sustainable mobility planning.

6. Proposed infrastructure projects are often defined early in the planning process. Selection and prioritization of projects to be considered in the formal planning process can thereby be more crucial than the tools and methods used in the subsequent assessment.

There are many examples of road investments that show a high socio-economic profitability despite negative impacts on urban development and climate change. However, allowing quantified profitability to outweigh other aspects is a political decision that can be reviewed. At the same time, history shows, that when an investment proposal is assessed and brought into the formal planning process the likelihood of it being implemented is also increased. Early decisions on which projects whatsoever should be investigated and assessed should therefore be given more attention.



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