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Future urban sustainable mobility using "area development negotiations" for scenario assessment and for assisting the democratic policy process

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Future Urban Sustainable Mobility: Using ‘Area Development Negotiations’ for Scenario Assessment and for Assisting the Democratic Policy Process

Peter Loukopoulos and Roland W. Scholz

September 2003
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Abstract

An examination of how land-use planning, conceptualised as a long-range travel demand management (TDM) measure, can proceed while simultaneously emphasising sustainability in transport objectives is presented. Given the time scale of such a TDM measure it is vital that citizen preferences are assessed. The Area Development Negotiation method for obtaining such preferences within a case study framework is detailed. The method permits evaluations by various interest groups of future urban mobility scenarios, which have been developed among scientists and case agents, using multiattribute utility analyses. In order to illustrate the method key results from a Swedish case study are presented demonstrating that all interest groups with the exception of business representatives had an awareness of the importance of environmental factors and that these factors were given greater weight than economic factors. Discussion focuses upon issues relevant to policy analysis and the democratic process such as how the method can support the policy process and the potential for meaningfully engaging the citizen in the democratic policy process.

Keywords: mobility, sustainability, scenario assessment, policy, democracy, participation, Area Development Negotiations, Exploration Parcours

1 Introduction

The second half of the twentieth century witnessed relatively consistent growth in car traffic in the industrialised world. Coupled with this was the growth in household ownership of cars, the expansion of road infrastructure and the decentralisation of economic activity along with the separation of housing and working. Recent years, however, have seen the growing realisation and acceptance that the quality of life in towns and urban areas is under increasing pressure from the growth in volume and use of motor vehicles. As a consequence, there is greater concern for the environmental and societal costs of traffic such as congestion, noise, air pollution and energy depletion (Goodwin, 1996; Green & Wegener, 1997; Sperling, 1995).

In recognition of the urgency of these problems, many European cities are contemplating various traffic restraint measures, such as vehicle bans or road pricing, where the dual aim is to reduce traffic levels and to obtain funds for alternative transport forms to the private car. Policy measures have thus historically progressed from the 1960s when increasing infrastructure to alleviate traffic problems such as congestion was commonplace, to the 1970s where the emphasis was on improving management of existing infrastructure, to the 1980s and beyond when policies began to target altering human behaviour (Bovy & Salomon, 2002). An even more recent manifestation is the attempt to alter human values and change mobility culture as has occurred in, for example, some parts of Switzerland with administrations marketing a slower lifestyle and better image for public transport (City of Zurich, 2002).

Travel Demand Management (TDM) measures is the term applied to the variety of policies designed to influence human travel behaviour (see Gärling et al., 2002, for a detailed re-
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TDM measures range from the coercive (“push” measures), such as road closures or road pricing, to the non-coercive (“pull” measures), such as the provision of cycle paths or the improvement of public transport (Steg & Vlek, 1997; Vlek & Michon, 1992). Goodwin (1998) also notes that TDM measures vary in the time scales for response to their implementation, ranging from the immediate (e.g., traffic calming) to the long-term (e.g., land-use and urban planning). In parallel to the variety of TDM measures available to transport planners, there has been a continued growth in the use of alternative fuel sources, in the establishment of car-pooling and car-sharing arrangements, and in the growth of alternative work arrangements such as telecommunications. Taken together, Jones (2002) argues the above trends imply that:

... both in policy and behavioural terms, we are rapidly moving into uncharted waters. As a consequence, the modelling and evaluation frameworks that were suited to trend extrapolation and assessing ‘more of the same’ are inadequate to address many of these emerging transportation planning issues. (Jones, 2002, p. 4).

Therefore, Jones argues that methods are needed that assess commuters’ responses to various TDM measures.

However, it is equally important given the long-range time scale of certain TDM measures’ impacts that methods are developed that assess citizens’ preferences for various land-use and urban planning strategies. These TDM measures require a great deal of effort, time and money to implement and it is highly undesirable to embark on a certain policy route that is either ineffective or unpopular amongst citizens. The reason being that if this were the case then a proposed long-term TDM will ultimately not achieve its goals or will potentially have other unintended side-effects or both. Given that local authorities are generally responsible for land-use planning, or at least are the first step in an authority chain stretching to regional and national levels, this presents an opportunity to engage citizens in the policy process and in the democratic process in general. Yet the means by which citizens are to be engaged is critical and, as such, the principal aim of the present paper is to describe and demonstrate the use of Area Development Negotiations (ADN) as a tool for achieving sustainable development and citizen involvement in the democratic policy process.

Concomitantly, the present paper also reports some of the substantive findings of a case study conducted in Gothenburg, Sweden which sought to understand the nature of the preferences the public has for various future urban mobility scenarios¹. These preferences are compared with those of various decision makers, including politicians, and with experts from various fields. The hope was to communicate the preferences of citizens to decision makers and to see where, if any, differences in preference arose between citizens, decision makers and experts. The focus of the research in the case study, then, was to see how the development of a new neighbourhood area could proceed in a manner fulfilling sustainability criteria.

¹ Given the focus of TDM measures is mobility, the term future mobility scenario is used throughout the paper as opposed to future land-use scenarios. However, it is important to note that the present research is applicable to both land-use and mobility as the latter depends on the former.
2 The Procedure: Area Development Negotiations (ADN)

2.1 Description

ADN is a procedure developed during case studies of urban and regional planning carried out by Scholz and colleagues (see Scholz et al., 1996). A case is unique but related to something general and can be defined as an empirical unit or a theoretical construct that is subject to evaluation because scientific and practical interests are tied to them (see Scholz & Tietje, 2002, for a review of the history and use of case studies). In the example to be considered in the next section, the case of the study was Lundby, a political district with approximately 32,000 inhabitants in Gothenburg, Sweden.

The ADN procedure has its roots in mediation (as a policy process) and in negotiation and bargaining (as decision-theoretic scientific objects and techniques). Negotiation and bargaining have been defined as the processes by which parties communicate and exchange proposals in order to come to an agreement, whereas mediation typically involves the use of an independent party to assist the other parties in resolving their dispute or reaching an agreement (Bercovitch & Jackson, 2001). In the case study context, the terms negotiation and bargaining are specifically used to refer to the sub-discipline within decision science examining individual, organisation and societal decision processes, whereas mediation is considered to be an administrative or adjudicative procedure (Scholz & Tietje, 2002). That the origins of ADN lay in mediation and negotiation is consistent with the premise that groups of case agents (i.e., stakeholders, interest groups) have differing interests and powers with respect to the dynamics of the case. Land-use planning, as it relates to future urban sustainable mobility, is amenable to ADN; citizens, politicians and experts all have varying interests and powers.

The aim of ADN is to provide an assessment of case agents’ interests and preferences in an Exploration Parcours (EP), which is the cornerstone of ADN and is a sequence of stimuli, interviews, experimental settings and encounters for a case agent that serve to provide the context for measures and judgements of preference. The Case Study Team (CST) has various roles. It works as a mediator between the interest groups, is responsible for the analysis of the case (i.e., assumes the role of researcher or analyst), and also participates in the EP. In the case to be described, for example, the stimuli used were detailed descriptions and visual aids of plausible, future urban mobility scenarios. These scenarios differed in various aspects, such as pollution, fuel use, congestion, and shopping structures (shopping centres vs. local town squares). Participants in the EP were required to immerse themselves in the situation and rate each scenario against several key criteria that had been developed in consultation with case agents (i.e., key interest groups and stakeholders) prior to the EP. It is an intensive procedure that requires upwards of 2 hours commitment by case agents. It is also a data rich procedure, producing data amenable to analysis using a multiattribute utility framework.

Scholz and Tietje (2002) argue that through the EP and the use of multiattribute utility analysis, ADN allows for the identification of areas of conflict and agreement between the different case agents and for the examination of any misperceptions. Such information assists the
mediation and negotiation aspects of ADN in enabling better conflict resolution and the establishment of Pareto-optimal solutions².

After having analysed and familiarised itself with the case and generated hypotheses, the Case Study Team is then able to begin the procedure, a summary of which is presented in Table 1.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obtain and ensure authorities' will for cooperation</td>
</tr>
<tr>
<td>2</td>
<td>Explain the mediation mandate; provide an account of the rules of the mediations, the role of the mediator and the expected output of the procedure</td>
</tr>
<tr>
<td>3</td>
<td>Select the relevant and appropriate case agents (interest groups and key players)</td>
</tr>
<tr>
<td>4</td>
<td>Conduct an Exploration Parcours so as to record case agents interests and their evaluations</td>
</tr>
<tr>
<td>5</td>
<td>Discuss relevant results with case agents and proceed with dedicated bargaining and negotiation</td>
</tr>
<tr>
<td>6</td>
<td>Submit the results of the ADN to the relevant authorities (see Step 1), particularly if representatives participated in the ADN</td>
</tr>
</tbody>
</table>

*Table 1: Summary of Area Development Negotiations (ADN)*

As with any procedure, the first step requires that the relevant authorities, owners, and others who have some form of legal power or right in the case are willing to participate in the ADN. This is a critical step as previous experience has often shown that the cooperation of authorities is a problem, particularly when defending a strong interest they fear may be damaged when direct democracy is introduced (Otway & Peltu, 1985). In this respect, the relative weight given to direct versus indirect democracy is a crucial factor for the success of procedures such as ADN and the need for ADN may differ from country to country. Knoepfel (1995), for instance, finishes his historical analysis with a strong statement that Switzerland needs neither mediators nor mediations. It turns out, however, that the ADN procedure is required in Switzerland and that there is even a developing practice of professional mediation (Keiner, 2001).

However, it is also argued that the outcomes of such procedures can, when taking a long-term perspective, act as an impetus for a more direct form of democracy (or at least greater active engagement mechanisms within a representative democracy) in that the results are grounded in scientific rigour, they include a broad subsection of the community and the outcomes fulfil sustainability criteria when attempting to resolve important societal problems. Furthermore, given the importance of the issues examined with ADN, future urban sustainable mobility being but one, participation and willingness to cooperate is typically not a problem. In the Lundby case study, for example, representatives and decision makers from the political dis-

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² Given a fixed set of scenarios, a Pareto-optimal solution refers to a scenario, \( X_s \), for which there exists no alternative scenario that is preferred by at least one party (i.e., case agent) while at the same time being less preferred than scenario \( X_s \), by at least one other party. If there exists an alternative scenario which is both preferred by at least one member and not less preferred than \( X_s \) by one other member, then \( X_s \) cannot be said to be Pareto-optimal.
strict and from superordinate regional authorities were willing to participate as were local residents and local business representatives.

The second step ensures that those parties who are involved in the ADN fully understand the role of the mediator as well as the concerns and expected output of the mediation. It is also important that all parties involved accept the mandate of the mediator (i.e., the CST). This ensures that the results will not be biased in favour of any particular group and that all the parties involved trust and respect the independence of the CST. Again, should authorities or other key interest groups not be willing to cooperate for the reasons outlined above, then the ADN procedure is inappropriate. Yet, given the nature of the problems examine with ADN, participation is often ensured, as is the acceptance of the CST’s mediation mandate.

The third step involves determining which of the key players should participate in the ADN and in which capacity they should do so. According to Scholz and Tietje (2002), there are two ways in which to select interest groups and key players: asking case agents whom they consider to be a key player or affected by the case (inductive approach), or by determining interest groups according to a sociological or legal model that differentiates between interests, such as those of environmentalists, residents, owners and so on (deductive approach). This latter approach also allows for hypothesis testing of differences between groups in terms of criteria weights or scenario preferences. In the Lundby case study both the inductive and deductive approaches were utilised so as to ensure the representativeness of participants and to ensure their relevance to the case study. An example of one categorisation of interest groups was residents, society representatives (e.g., political decision makers; local associations) and business interests (e.g., local business owners; regional and national business interests).

Step 4 in ADN consists of the EP procedure where the aim is to reveal and record the interests and evaluations of the various representative and relevant interest groups and key players. The categorisation into interest groups of EP participants was done on the basis of what role they played for the mobility of Lundby (Kåberger & Scholz, in press). The central nature of EP to ADN cannot be emphasised enough. The data collected can be subjected to a multiattribute utility analysis (for reviews, see Edwards & Barron, 1994; Yoon & Hwang, 1995). An exposition of the details of the EP procedure will be provided below.

Step 5 involves discussing the results of the EP with the case agents. The idea is to allow participants to gain a better understanding of the conflict structure, obtain better judgements and interactions amongst the case agents and, if possible, to enable approximations to Pareto-optimal solutions. At the conclusion of the Lundby case study, for example, a local meeting was held at municipal offices presenting the key findings. The result was a commitment on the part of the local decision makers to take into consideration the views and opinions of the residents with respect to their desires for the future of local developments and transportation in the district. The final step requires that the results be submitted to the relevant authorities and decision makers (as defined in Step 1).
2.2 The benefits of ADN

The benefits of ADN lie in the formalisation of the mediation mandate and the devotion to dedicated bargaining and negotiation as well as in its reliance on EP as a means by which to obtain stakeholder evaluations and preferences. The issue of sustainability in general, and of sustainable urban mobility in particular, is complex. Fischer (1977) has demonstrated that the decomposition of such complex issues is of benefit to both the decision making process and its outcomes. Of particular relevance to the present study, such decompositional approaches permit the consideration of a larger number of attributes than holistic approaches, thereby allowing for clear communication of value conflicts (a great benefit in the later stages of ADN).

The EP in essence requires the decomposition of future urban sustainable mobility scenarios into smaller, more manageable parts (defined according to certain evaluation criteria) and then requiring the logical aggregation of these smaller parts so as to obtain an overall utility for each scenario. Such a decomposition procedure has higher reliability than holistic, intuitive judgements because the more manageable, smaller parts of the decision should contain less random error (Ravinder & Kleinmuntz, 1991). Furthermore, higher degrees of correspondence with an external criterion have been obtained using decomposition methods (Stillwell et al., 1983). In this sense, the decomposition required in the EP renders it superior to holistic preference judgements. The major drawback of holistic judgements is the loss of the explicitness when it comes to criteria weights and ratings, which as already noted is crucial to the mediation-based stages of the ADN procedure. Giving further impetus for the use of EP, Vlek et al. (1999) have shown that the ordering of preferences for different policy scenarios can be affected by the method of elicitation (intuitive, holistic vs. multiattribute, decomposed).

Additionally, because the decomposition (and re-aggregation into an overall utility score) is explicit, the communication between different stakeholders in a case study is greatly assisted in the negotiation and bargaining stage of ADN. As conducting a case study and constructing an EP is a participative and transdisciplinary process (Scholz & Marks, 2001), then the EP procedure itself is an ideal means by which to encourage deliberative, citizen engagement in the democratic policy process.

2.3 Exploration Parcours (EP)

2.3.1 Procedure

The stimuli utilised in an EP are scenarios. Jungermann (1985) defines a scenario as a representation of a system's development from an initial state to an expected and/or desired final state. Scenarios can be conceived as paths in a decision tree and their major purpose is to provide descriptions of possible futures in terms of their basic and major events, trends and activities. A useful distinction is between predictive scenarios and prospective (action) scenarios; in the former one tries to anticipate the future and in the latter one tries to steer towards a given goal. The scenarios utilised in the case study are created as a combination of both global and
regional developments (predictive scenarios) and potential local land-use planning developments (prospective scenarios). Examples of scenarios, all designed to be internally consistent and plausible, designed by the CST using the Formative Scenario Analysis Method (see Scholz & Tietje, 2002) will be provided in the following section. The details and processes involved in scenario construction, and the complete set of different scenarios utilised in the EP is available in Kåberger & Scholz (in press).

It is important to note that the use of multiple scenarios in the EP is an ideal way of dealing with the phenomenon that single scenarios, characterised by reasons or concrete details, encourage people to exaggerate the likelihood of occurrence and increase confidence in them (Kuhn & Sniezek, 1996). However, work by Schoemaker (1993) demonstrates that by forcing people to consider more than one plausible future scenario, they are unlikely to place too much confidence in any one. While participants are not asked to judge the likelihood of any scenario during an EP, it is important that preferences were not confounded with likelihood estimates. This is yet another benefit of using EP within the ADN framework. The role of the CST is to define the problem space in which socio-economic discussions and decisions are made and not to provide prescriptive recommendations about which states (i.e., scenarios) are more desirable. This is achieved through the selection of scenarios in an EP (within the ADN methodology framework) upon which case agents’ discussions and decisions will be based.

In essence, the EP requires that participating case agents be asked to evaluate future scenarios on a series of different criteria to which they then assigned weights. Table 2 provides a summary of the steps required in the EP conducted in the Lundby Case Study (see also Scholz & Tietje, 2002 for a description of the procedure).

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Presentation of the case</td>
</tr>
<tr>
<td></td>
<td>Explanation of EP procedure</td>
</tr>
<tr>
<td></td>
<td>Obtain background and personal characteristics</td>
</tr>
<tr>
<td>2</td>
<td>Presentation of scenarios in random order with the use of audio and visual aids</td>
</tr>
<tr>
<td></td>
<td>Interviewer answers any questions about each scenario and asks participants to report the positive and negative aspects of each scenario</td>
</tr>
<tr>
<td>Break</td>
<td>Refreshments provided to participants</td>
</tr>
<tr>
<td>3</td>
<td>One scenario at a time:</td>
</tr>
<tr>
<td></td>
<td>participants provide intuitive ratings of scenario attractiveness</td>
</tr>
<tr>
<td></td>
<td>participants rate each scenario on each criterion</td>
</tr>
<tr>
<td>4</td>
<td>Obtain evaluation criteria weights from participants after all scenarios have been rated</td>
</tr>
</tbody>
</table>

*Table 2: Exploration Parcours (EP) in the Lundby Case Study*
Each participant takes part in the EP on an individual basis with two members of the CST, one functioning as the interviewer and the other as secretary. The participants are given a presentation of the case study and of the purpose of the procedure they are about to undertake. Background and personal characteristics are obtained. They are then presented with each of the scenarios in random order with the use of visual and audio aids such as posters and audiotapes describing the future scenario. After each presentation they are asked by the interviewer to report on the good and bad aspects of each scenario. Upon completion of this task, participants are typically given a short break and provided with refreshments.

After the break participants are presented with each scenario again. One scenario at a time, they are asked to rate the attractiveness of each on a scale from 1 to 100, with 100 being the most attractive. The next step involves rating each individual scenario on each criterion, also on a scale from 1 to 100. After doing this for each scenario, participants are provided with a list of the criteria used in order to obtain their respective weights. The method utilised in Lundby Case Study was the swing weighting method (Scholz & Tietje, 2002; von Winterfeldt & Edwards, 1986), where swing weights range from 0 to 100 with a swing weight of 100 being assigned to the most important criterion. All other criteria receive a smaller weight in line with how the participant judges each criterion’s importance. The total time required for the EP in the Lundby Case Study ranged from 2 to 2 hours.

A final issue worth considering is why an EP should be preferred to a large-scale questionnaire study. A mail-back questionnaire is no doubt convenient and a generally easier to administer than an EP. However, the stimuli required for an EP are very complex, carefully considered, detailed scenarios. An EP provides close-to-reality encounters with potential future states of the world and these would require quite lengthy descriptions in a questionnaire booklet even with the benefit of diagrams and figures. There is furthermore no guarantee that the respondent has fully understood the intricacies and nature of each scenario. In the EP procedure, which has the benefit of using audio and visual tools, a member of the CST follows the participant and, after each scenario, discusses and answers any questions the participant may have. This not only encourages both interaction and deliberation on the part of the participant in contrast to the general passivity of a questionnaire (Leach & Wingfield, 1999), but also ensures as much as possible that the participant in the EP has a clear understanding of the stimuli for which he or she will provide ratings for on a series of sustainability criteria. One final note relates to the possibility of the CST influencing EP participants’ judgments. Great care was taken in scenario construction and EP preparation, as in any experimental research, to ensure that no biases were introduced. The very nature of the CST as an independent group of researchers with no vested interests in the case study is also a necessary precaution in ensuring the independence of results obtained via the EP (and, as mentioned previously, in obtaining the trust and cooperation of all case agents involved in the ADN procedure).
2.3.2 Data

The data obtained from an EP include criteria weights and scenario performance ratings on each of these criteria. Furthermore these weights and performance ratings can be obtained from either the CST or the EP participants allowing for a detailed analysis of future urban mobility scenarios in terms of various utility scores, a summary of which is provided in Table 3. The various utility scores defined in Table 3 (maut $\alpha$, maut $\beta$, and maut $\gamma$ scores, where ‘maut’ stands for ‘multiattribute utility theory’) are all explicit means by which to aggregate decomposed judgements. These scores vary in terms of whose weights and whose attractiveness ratings are used in calculating the utility scores.

<table>
<thead>
<tr>
<th>Source of information</th>
<th>MAUT utility score$^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alfa ($\alpha$)</td>
</tr>
<tr>
<td>Criteria</td>
<td>CST$^2$</td>
</tr>
<tr>
<td>Ratings/Judgments</td>
<td>CST</td>
</tr>
<tr>
<td>Criteria weightings</td>
<td>CST</td>
</tr>
</tbody>
</table>

Table 3: Different types of utility scores and their source

Notes: $^1$ There is also a maut $\delta$ utility score, which has all three sources of information provided by EP participants. This was not utilised in the present case study but has been used in some Swiss case studies (e.g. Scholz et al., 2002). $^2$ CST = Case Study Team, $^3$ EP = Exploration Parcours

All the utility scores are based on the same evaluation criteria outlined in the next section (Table 4), which were developed by the CST in consultation with the various actor groups. Maut $\alpha$ utility scores combine the weights given to the criteria by the CST with predicted values that each of the future situations would have on each of the criteria. These values are determined in consultation with the literature, experts, council, regional and national plans and other source material. Transformation of these scores into utilities is achieved with the Logical Decisions software package (Smith, 1995) using a utility function of an appropriate shape (e.g., in the case of air quality, a linear function was assumed because the lower the level of nitrogen dioxide and heavy particle emissions the higher the utility). Summing across criteria yields a score for each situation. As such, these scores represent scientific evaluations of the performance of future urban mobility scenarios on a range of sustainability indicators. Maut $\gamma$ scores are derived by multiplying the weights given to each criterion by EP participants with the ratings and judgements (0–100) of how each situation performs with respect to each criterion. Summing these scores across criteria provides a maut $\gamma$ utility value for each situation. These scores, therefore, serve as a useful point of comparison to maut $\alpha$ scores in that maut $\gamma$ scores build upon case agents’ subjective judgements of the performance of future urban mobility scenarios with respect to sustainability. Maut $\beta$ lies somewhere in between the other two and combines the predicted values determined by the CST for each scenario on each criterion with the weightings given by EP participants to the appropriate criterion. The motivation behind such an aggregation becomes apparent with reference to the sachbearbeiter concept (Scholz et al., 2002).
The idea is that ratings of performance should be conducted by experts and those who have the skills and ability to do so, whereas the judgement of the importance and relevance of this performance rating ought to be left to those people affected. In other words, citizens, unlike experts, may be unaware of scientific foundations and may not know how to judge the performance of a scenario with respect to its ability to fulfil clean air standards (as measured by emissions), but they are assumed to know how important clean air is to them. Finally, the various utility scores allow for some important comparisons. A comparison between maut $\alpha$ and $\beta$ scores indicates the difference in criteria weightings between the CST and EP participants. A comparison between maut $\beta$ and $\gamma$ scores indicates differences in the performance ratings given to the future urban mobility scenarios.
3 The Lundby Case Study: A Brief History and Description

The area of Lundby, Gothenburg, Sweden (see map in Figure 1) has witnessed dramatic changes in recent years to its old harbours and shipyards situated along the foreshore of the Göta River. On the southern foreshore lies Gothenburg’s city centre. Travel between the two areas, and between the northern and southern parts of Gothenburg in general, is accomplished either by bridge (the Älvsborg Bridge on Lundby’s western edge or the Göta Älv Bridge on its eastern edge), tunnel (Tingstad Tunnel), or by ferry across the river. For approximately 130 years this area was the centre of the Swedish shipbuilding industry and in the 1960s it was one of the world’s largest shipbuilding centres (Eriksson, 1994). Despite the discontinuation of this industry in the 1970s leaving a 5 km strip along the banks of the Göta River, the vast majority of Swedish and Nordic freight continues to be transported either along the Lundbyleden (by road) or the Hamnbanan (by rail).

This narrow strip of embankments and industrial buildings is currently undergoing redevelopment and the plan is for the area to soon accommodate some 50,000 people with an equal distribution of housing, educational institutions and workplaces. Furthermore, it is envisaged that the area will become an IT centre for Western Sweden (Vision Lundby, 2002).

Over the course of the case study the CST worked in consultation with certain key representatives (e.g., residents, local business owners, politicians) to develop suitable sustainability criteria by which to judge future urban sustainable mobility scenarios. These criteria (see Table 4) cover the ecological, economic and social aspects of sustainability.

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3 The tunnel is physically and administratively on the other side of the eastern border but with the vast majority of entrances and exits going onto the major east-west arterial (Lundbyleden) which lies within Lundby, and which cuts off the northern areas of Lundby with the foreshore areas.
### Table 4: Examples of evaluation criteria used during the Lundby Case Study

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Indicator and unit of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 Climate effects</td>
<td>Carbon dioxide emissions</td>
</tr>
<tr>
<td>C2 Air quality</td>
<td>Nitrogen dioxide and heavy particle emissions</td>
</tr>
<tr>
<td>C3 Physical accessibility</td>
<td>Barrier effects of the Hamnbanan and the Lundby-leden: 0 (worst) to 15 (best)</td>
</tr>
<tr>
<td>C4 Societal costs</td>
<td>Infrastructure costs in Swedish kronor (SEK)</td>
</tr>
<tr>
<td>C5 Transport costs</td>
<td>Swedish kronor</td>
</tr>
<tr>
<td>C6 Turnover</td>
<td>Swedish kronor (compared to the present day’s turnover)</td>
</tr>
<tr>
<td>C7 Price (of goods)</td>
<td>Swedish kronor (SEK/grocery bag)</td>
</tr>
</tbody>
</table>

**Note:** The reader may be concerned that criteria such as congestion or noise are not present. It is important to bear in mind that these are a subset of the evaluation criteria utilised during the case study. More than one EP was conducted in the Lundby case study utilising other relevant evaluation criteria, some of which overlap with the criteria presented in the above table (see Kåberger & Scholz, in press).

It is beyond the scope of the present paper to discuss the suitability of the above criteria and the definition of the term sustainability, of which the criteria in Table 4 can be seen as part. As with any complex, multi-faceted term there is no single accepted definition although most definitions tend to imply the need for a conservation of natural resources and include a reference to the welfare of both the present society and the society of the distant future (e.g., Chichilnisky, 1996; Heal, 1998). For a discussion of the main classes of definitions of sustainability developed in the literature see Perman et al. (1999). The point to note is that the process involved in eliciting and agreeing upon the criteria was ongoing. This not only allows case agents to feel that they are an indispensable part of the case but also makes multiattribute utility analysis in the EP an efficient one by narrowing the range of criteria and focussing on what case agents feel is important. This is an important fact because one does not want participants judging future scenarios on criteria, which are unimportant and which would in all likelihood receive a very low weight (Edwards & Barron, 1994). Furthermore, defining sustainability in conjunction with case agents in an explicit manner avoided the problems associated with multiple definitions and linguistic ambiguity that have arisen in previous research applications and projects (e.g., Benneworth et al., 2002). It is important to note that the criteria arrived at were not simply what case agents felt was important but that they also reflected the recent scientific-consensus notions of sustainable development; focus group discussions (see Fern, 2001, for a detailed review of focus group procedures and theoretical underpinnings) were held with case agents led by a member of the CST who (i) asked participants what was important to them with regard to sustainability and (ii) presented common measures and criteria for sustainability, and (iii) led a discussion of the merits of each criterion and of which criteria case agents saw as relevant to the case study and themselves. The experiences gained from nearly 20 EPs in Switzerland indicate that the multiattribute evaluations exhibit high reliability and validity (Tietje & Scholz, 2001). In sum, the sustainability criteria were developed and selected both with reference to the scientific literature and through ongoing consultation with stakeholders – a procedure that is not without precedent and that has met with success in practical applications (Foxon et al., 2002).
The following sections elaborate on a small part of the methods and procedures used in the Lundby Case Study. More specifically, the results of one of several EPs conducted are presented and discussed in detail in order to provide insight into the nature of the analyses and results obtained through the EP stage of the ADN procedure. The selected results will focus on key aspects and typical outcomes of the ADN and EP procedures utilised to demonstrate the benefits of these procedures to the democratic policy process.
4 Method

4.1 Participants

The average age of the EP participant (11 males and 11 females) was 43.5 years with a standard deviation of 10.6 years. There were three groups in the EP. These were business representatives, society representatives (e.g., politicians and interest groups) and residents, with each group comprised of 11, 6 and 5 participants, respectively. No significant differences were found in ages between groups or in sex distribution, nor were there any differences among the sexes in any of the analyses reported in the following section. Greater detail regarding the socio-economic background of participants (e.g., educational level and environmental group membership) is provided in Kåberger & Scholz (in press).

Despite the small sample size in the Lundby Case Study, representativeness of case agents was emphasised and the results obtained were still informative and useful in the latter stages of the ADN procedure. However, larger groups should be obtained whenever possible as is typically the case in the Swiss ETH-UNS studies, which served as the template for the Lundby Case Study.

4.2 Procedure

The procedure outlined in Section 2.3 was followed. The stimuli consisted of a total of four local shopping structure variants (i.e., the status quo; shopping centre-based developments; developments focussing on local town squares; internet shopping developments), which were combined with various mobility arrangements (e.g., extension of the road network; public transport investments). The resulting number of scenarios from the combination of these two facets was whittled down to seven, in essence developed through consultation of council, regional and national development plans and with the use of the Formative Scenario Analysis Method (Scholz & Tietje, 2002). This method assists in reducing the number of scenarios by excluding those, which are internally inconsistent and implausible. The scenarios, along with the shopping and mobility arrangements comprising them, are presented in Table 5.

It is important to note that the aim was not to systematically manipulate scenarios so as to determine what affects participants’ judgements although the EP could be adapted to this scientifically focussed end. Rather, the EP and ADN are crucial components of the Lundby Case Study and, as such, the first priority is to provide useful data and input for Lundby, for the authorities, for the local residents and other case agents. That is, ADN can be seen as a useful tool for the democratic policy process. The usefulness to case study agents, along with plausibility and internal consistency, is what drove the final selection of scenarios.
Table 5: Description of scenarios used by in the Exploration Parcours

<table>
<thead>
<tr>
<th>Scenario 0:</th>
<th>Scenario description</th>
</tr>
</thead>
<tbody>
<tr>
<td>- continuation of present-day trends</td>
<td>Lundby continues to develop in line with the trends apparent in the present-day. The most pressing problem is the interplay between the large shopping centres and local town squares, with the latter having difficulty in competing with the former in terms of, for example, open times, variety and concentration of goods and services.</td>
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<table>
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<tr>
<th>Scenario 1:</th>
<th>Scenario description</th>
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<tbody>
<tr>
<td>- shopping centres</td>
<td>Large chains increasingly dominate trade and many areas are dominated by large multinational and national chains. Shopping centres increasingly resemble small cities within a city. Backaplan and Eriksberg (shopping centres) are aimed at consumer with cars.</td>
</tr>
<tr>
<td>- small-scale public transport investments</td>
<td>There are small-scale investments in public transport in the form of more regular services, more routes and improved comfort. Furthermore there is a 20% discount provided to patrons who are also members in a car-sharing scheme. Yet investments also continue to be made on road infrastructure.</td>
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<tr>
<th>Scenario 2:</th>
<th>Scenario description</th>
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<tbody>
<tr>
<td>- shopping centres</td>
<td>The shopping context in this scenario is the same as for Scenario 1.</td>
</tr>
<tr>
<td>- road infrastructure investments</td>
<td>Investments are prioritised to the road network (new roads and bridge). No economic measures are implemented to reduce car-use and now new investments are made on public transport.</td>
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<tr>
<th>Scenario 3:</th>
<th>Scenario description</th>
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<tr>
<td>- local town squares</td>
<td>There has been a concerted effort to provide centrally situated residences around smaller town squares. As a result it has become more profitable to own smaller businesses (e.g., grocery stores, cafés, postal centres) at town squares.</td>
</tr>
<tr>
<td>- business as usual</td>
<td>Society develops in line with present day trends: there is some expansion of the tram network, minimal use of road or congestion pricing, and bottlenecks are built away. Additionally, freight traffic is rerouted from the Hamnbanan to the north of Lundby before continuing on to the port of Gothenburg.</td>
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<tr>
<th>Scenario 4:</th>
<th>Scenario description</th>
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<tbody>
<tr>
<td>- local town squares</td>
<td>Town squares develop in this scenario mirroring the development described in Scenario 3.</td>
</tr>
<tr>
<td>- new transport system</td>
<td>No private cars permitted within Lundby. Large-scale investments on public transport are made in the form of alternative modes to the bus and the tram: personal rapid transit and group rapid transit systems, much like a monorail in the latter case and a car-size monorail in the former (see Andréasson, 1998), as well as a new ferry service across the river.</td>
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<tr>
<th>Scenario 5:</th>
<th>Scenario description</th>
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<tbody>
<tr>
<td>- internet shopping</td>
<td>Internet shopping comes to occupy a substantial role in the future shopping context, partly in response to increase internet usage. Previously small boutiques are transformed into showrooms, with stock centres in cheaper locales outside the city centre. Delivery of goods is organised and planned and as a result total transport is minimised, as consumers do not need to travel as much as they once did.</td>
</tr>
<tr>
<td>- small-scale public transport investments</td>
<td>Investments in public transport and road infrastructure correspond to those described above for Scenario 1.</td>
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<table>
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<tr>
<th>Scenario 6:</th>
<th>Scenario description</th>
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<tbody>
<tr>
<td>- internet shopping</td>
<td>Internet shopping is an important aspect of this scenario’s future urban shopping context, as described in Scenario 5.</td>
</tr>
<tr>
<td>- new transport system</td>
<td>No cars are permitted within Lundby and extensive investments are made in a new transport system, as described in Scenario 4).</td>
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Finally, although the recruitment of relevant case agents in the Lundby Case Study was achieved with the use of both inductive and deductive methods and although the EP was more exploratory in nature, a few intuitive hypotheses were proposed by the CST:

i) the criteria relating to the environmental/ecological aspects of sustainability would be given the greatest weight overall;

ii) the criteria relating to the economic aspects of sustainability were more likely to be given greatest weight by business representatives; and,

iii) shopping arrangements consisting of local town squares would be the most preferred scenarios due to both the close proximity to households providing high accessibility and to the positive image often associated with lively town squares.

4.3 Results

4.3.1 Shopping variants

Participants’ intuitive attractiveness ratings of the four shopping variants are presented in Figure 2. The ratings (ranging from 0 to 100) were divided by 100 yielding a scale ranging from 0 to 1. This was done in order to enable ease of comparison with later utility analyses.

![Figure 2: Intuitive ratings for the four shopping variants](image-url)
The most striking feature in Figure 2 is the clear preference for the variant defined as shopping developments based on local town squares. The remaining variants are not nearly as attractive and do not differ from one another. These findings were confirmed by 3 (actor group: business representatives vs. society representatives vs. residents) by 4 (variant: status quo vs. shopping centres vs. local squares vs. internet shopping) analysis of variance (ANOVA) with repeated measures on the last factor. There was a significant main effect of variant, $F(3, 17) = 8.66, p < .001$, but neither the actor group main effect, $F(2, 19) = 1.77, ns$, nor the interaction effect, $F < 1$, reached statistical significance. Bonferroni-adjusted post-hoc comparisons revealed, as hypothesised, that the local town square shopping variant was significantly preferred to the status quo, shopping centre developments and the Internet shopping variant.

4.3.2 Scenarios

Criteria weighting Figure 3 shows the weights given to the criteria by the three actor groups and the CST. The weights given to the criteria by the CST were arrived at by group discussion and took various factors into consideration (e.g., European Union environmental targets and standards, prior meetings with Lundby stakeholders and representatives). The main point to note is that the CST’s weights are only important (as far as the aims of the case study are concerned) in calculating maut-scores. If more basic research were being undertaken, then it would be appropriate to adopt another method for obtaining the CST’s criteria weights (e.g., having individual members of the CST provide weights and obtaining means and standard deviations).

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4 All statistics reported in the present paper use a Greenhouse-Geisser correction.

5 All Bonferroni adjustments reported in the present paper are at the $\alpha = .05$ level.
A 3 (actor group: business representatives vs. society representatives vs. residents) by 7 (criteria, see Table 4) ANOVA with repeated measures on the last factor revealed no overall effect of actor group, F < 1, but a significant main effect of criteria, F (6, 114) = 3.39, p < .05, and a significant group by criteria interaction, F (12, 114) = 2.67, p < .05. Bonferroni-adjusted post-hoc comparisons revealed that, ignoring actor groups, the physical accessibility criterion (c3) was given greater weight than societal costs (c4). However, post-hoc tests gauging the significant interaction effect revealed that for the business representative group, the climate effects (c1) and air quality (c2) criteria were given significantly less weight than they were given by either of the remaining two groups. The business group also gives significantly more weight to the turnover criterion (c6) than the resident group. Finally, these two groups did not differ from each other with respect to the price criterion (c7) unlike the society representative group. If one were to make a broad conclusion from the above data, it would be that the business group gives less weight to the ecological sustainability criteria than the economic sustainability criteria, relative to the remaining groups, with the exception of the price criterion, which is also given a large weight by the resident group. In other words, while the first hypothesis was not supported, the second hypothesis positing an interaction between criteria weights and actor groups was supported.

As the swing weight method required the sum of all criteria weights to equal 1 for each individual a main effect of group for criteria weights is not possible.
Maut $\alpha$, $\beta$, and $\gamma$ utility scores Figure 4 illustrates the way in which the maut $\alpha$ and maut $\beta$ scores tend to be rather similar to each other. This confirms what can be seen in Figure 3; the weights given to the various criteria by the actor groups are similar to those weights arrived at by the CST, as this is the only difference in the calculation of the two utility scores. Taking this one step further, the implication is that if there are large differences between maut $\beta$ and maut $\gamma$ scores, then these must be attributable to the fact that the actor groups rated certain aspects of situations as either less or more attractive than the CST.

Figure 4 indicates that there tends to be a general agreement between the various utility scores for most scenarios. The notable exceptions are the maut $\gamma$ evaluations for Scenario 0 (continuation of present-day trends) and Scenarios 1 and 2 (shopping centres combined with either small-scale public transport investments or road infrastructure investments, respectively). Scenario 0 maut $\gamma$ scores are lower than the remaining two utility scores, suggesting that EP participants believe this is worse than the CST believes it to be. By the same reasoning, Scenarios 1 and 2 are seen as more attractive by actor groups than the CST. However, these differences are not so interesting from a practical perspective, as it is Scenarios 3, 4, 5 and 6, which are clearly preferred to the other scenarios. Participants appear to prefer the local town square shopping situation and the Internet shopping arrangement (irrespective of the mobility arrangement with which either is combined). This is consistent with the third hypothesis with the added qualification that Internet shopping arrangements can also be highly rated and appealing given the right mobility arrangements. Finally, a future urban scenario with large shopping centres is much less preferred to the present day trend. Clearly, all this is useful information that town planner and policy makers could utilise.

Further results concerning how the various interest groups differ with respect to utilities assigned to the various scenarios can be found in the case study report (Kåberger & Scholz, in press). The following section is confined to presenting the results from an analysis of maut $\gamma$ utility scores, which are based on the interest groups’ scenario ratings and criteria weightings.

Analysis of maut $\gamma$ utility scores A 3 (actor group) by 7 (scenario, see Table 5) ANOVA with repeated measures on the last factor revealed no main effect of actor group, $F < 1$, a significant effect of scenario, $F (6, 114) = 10.4, p < .001$, and no significant interaction, $F (12, 114) = 1.31, \text{ns}$. This suggests that despite differences in weightings among actor groups, the utilities assigned to scenarios tend to be similar across actor groups. Follow-up Bonferroni-adjusted pair wise comparisons revealed a similar pattern of findings as described in the previous section. Namely, Scenarios 3, 4, 5 and 6 receive significantly higher scores than the remaining scenario. The exception is the difference between Scenario 2 and Scenarios 4 and 6, where both comparisons fail to reach significance after Bonferroni-adjustments but are in the right direction.
4.4 Some conclusions and potential policy outcomes

4.4.1 Environmental awareness

Of the many potential future urban scenarios examined, a general conclusion that may be drawn is that there is an awareness on the part of participants of the importance of environmental factors. These are, with the exception of the business representative group and the price criterion for residents, generally given more weight than economic factors relating to sustainability.

4.4.2 Integrated land-use and mobility planning

The differences in ratings for the shopping variants on their own and for the shopping variants in the context of various mobility arrangements (i.e., scenarios) are quite noticeable. There are some important implications from these differences, namely that mobility arrangements greatly influence the performance and attractiveness of the various shopping arrangements and that holistic and decomposed judgements are not guaranteed to yield similar outcomes. It may be the case that decomposed judgements result in more reasoned judgements that are not overly influenced by one or two criteria. It is unfortunate that participants were not asked for intuitive ratings of the various scenarios. It would have been easier to distinguish between differences in ratings arising from differences in method of rating elicitation (holistic vs. decomposed) or those arising from mobility arrangements’ influence on the attractiveness of various arrangements (variant vs. scenario). It does seem plausible, however, to expect that participants’ preferences and ratings of, for example, Internet shopping, to be influenced by the mobility context. Therefore, this seems to confirm the importance of and need for integrated land-use and mobility planning.

4.4.3 Visions of urban mobility

When examining the scenarios, it is apparent that participants preferred the idea of local town squares and Internet shopping to the shopping centre. It is important to note that nowhere is it implied that people wish to eliminate shopping centres; they are a valuable tool. However, case participants have a desire to see the possibility of Internet shopping and a lively town square, as opposed to the steady disappearance of present suburban squares. One can interpret such results as being consistent with Bertolini and le Clercq’s (2003) contention with respect to urban development that people ask not for generic mobility per se, but for opportunities to participate in spatially disjointed activities. Local town squares and internet shopping assist residents’ accessibility by increasing the amount and diversity of opportunities, albeit in different ways, that can be reached within a certain amount of time.

Nor are either of these possibilities unrealistic; at present, as revealed in a questionnaire study carried out as part of the Lundby Case Study (Bengtsson, in press), approximately 50% of daily grocery purchases by Lundby residents already take place at local squares, whereas 75% of purchases of other goods take place at larger shopping centres. Should the variety and breadth
of goods and services available at local squares improve, then there is a strong chance that a larger number of customers would choose to purchase there thereby potentially influencing the modal split as documented for certain regions of Amsterdam (Bertolini & le Clercq, 2003). Furthermore, Internet shopping implies a clear link between business strategies and lifestyles. Businesses need to develop ways to coordinate transport, simplify ordering procedures and improve the variety of goods available on the Internet. Consumers need to utilise the Internet to a greater extent than they do at present in their purchase of goods.

4.4.4 Diagnosing interest group opinions

On a substantive level local authorities can use the provided information to design policies that assist in either of these developments (i.e., internet shopping or local town squares). On a more methodological level, they could do so with the knowledge that these future scenarios are the ones preferred as revealed in terms of utility scores by various actor groups representing subsections of the Lundby community. A meeting at the completion of the case study period was arranged between local authorities, case agents, residents, other interested parties and the CST at council offices. It was mentioned by the mayor that they were pleased that actor groups were so enthusiastic about local squares, because even though the idea of addressing the issue had long been contemplated, they were uncertain over whether or not to invest the resources in such a project if residents, for example, were to be opposed to this.

4.4.5 Developing orientations

Finally, it is important to note that the outcome of the study was not a series of recommendations for action (the CST is not a decision maker), but rather a series of sustainability orientations. This is in line with the focus of the research, which was to examine how the development of residential and business areas in a neighbourhood area could proceed given a set of sustainability standards and criteria. The idea was to present a series of potential future urban mobility scenarios that varied in terms of their sustainability and their attractiveness, thereby defining the problem space and allowing the relevant case agents to make their decisions and discussions regarding the most desired goal or outcome within this space. That is, the case study assisted case agents’ development of sustainability orientations (e.g., through assessing the weights they place on various sustainability criteria or even by aiding the development of cognitive or action schemes when dealing with variants and scenarios) but left the decision of how to realise these orientations up to the decision-makers.
5 Lundby after the case study

A year after the conclusion of the case study, it was apparent that the main results were incorporated into the day-to-day functioning of the relevant Lundby council authorities. It is a conscious aim of authorities to maintain and reintroduce lively local town squares that are economically, socially and environmentally sustainable and that are desired by residents. To this end, various support measures have been undertaken both by council and by other actor groups. For example, the real estate/property-owners association has started a local association for properties around one local square which has already measured safety and security, with the cooperation of the local administration, with the aim of improving residents’ perceptions of safety as well as objective measures in order to encourage visitors to return to the local square. Additionally, Lundby authorities have begun a crime prevention body with a variety of partners. This body is a sub-group of the local public health and well-being authority and the coordinating authority for local town development (A. Jögård (mayor), personal communication, 21 May 2003). From an economic perspective, arrangements have been established with the European Union’s Urban II programme (European Regional Development Fund, 2003), which is aimed at increasing employment and cooperation with companies and businesses, as well as improving infrastructure.

Inter-actor cooperation and communication has also been improved since the case study’s conclusion. Local authorities and the Department of Transport have worked closely to develop new and alternate ways of meeting the different transport patterns of the various actors within Lundby, patterns which authorities became aware of as a direct result of the case study. Work is ongoing and the idea is to utilise Vision Lundby (Vision Lundby, 2002) and the newly established Lundby Mobility Centre as a means of, for example, increasing public transport use, improving and increasing car-pooling and car-sharing arrangements and developing “a cycling suburb” (A. Jögård (mayor), personal communication, 21 May 2003).

The point to note is that the results have served as an impetus. Formal negotiation and conflict resolution has not yet been required given the many common interests amongst the actor groups as revealed in the previous section. The product is not a static ‘sustainable Lundby’, but rather a dynamic process linking relevant authorities and actor groups in a network that continues to exist beyond the case study and which has a ‘sustainable Lundby’ as a key objective. It is unlikely, given the active, newly created network, that any differences and potential conflicts go unnoticed so that they become irreconcilable. Rather, open dialogue ensures early diagnosis of potential conflicts and, more importantly, early resolutions. It may be that differences requiring negotiation arise at a later point. However, if this occurs, mechanisms and means of inter-actor communication have been established allowing for the negotiation phase to be initiated unaided.
6 Policy and Democracy Implications

The following sections touch briefly on some fundamental questions relating to policy analysis and the democratic process. While the aim of the present paper has been to present and describe the ADN and EP methods, it is nevertheless useful and informative to consider their position in the broader policy and democracy context. What follows, therefore, can be considered an initial, preliminary and initial discussion of potential future research domains in the field of policy tool development for the implementation of sustainability as well as issues that need to be more carefully examined and thoroughly explicated.

6.1 Supporting the policy process

As has been seen in the previous section and in previous Swiss case studies, ADN and more specifically EP have the ability to clearly add to policy formation and implementation processes. The method can be used to identify conflicts and misperceptions. For example, one ETH-UNS case study (Scholz et al., 1996) involved the issue of redeveloping an old industrial site, the Sulzer Escher Wyss area in the centre of Zurich. Demonstrating the benefit of utilising decomposed judgements pinpointing where differences between stakeholders arose, it was found that economists differed greatly from other groups in the study when considering criteria, references, weights and scenario ratings. Furthermore, it was discovered that owners and public administration were not interested in dealing with the residents and environmentalists. Investors were, on the other hand, as they could not ignore the interests of future tenants. In this case study, the policy process was assisted not only from the EP but also the ADN stage, where discussions could benefit from knowledge that stakeholders preferred different scenarios as a result of differing criteria weights or ratings. Negotiations could focus on these causes of disagreements rather than the observable symptoms (i.e., different scenario preferences) so as to see what compromises and agreements could be reached. Today, the development of the Sulzer Escher Wyss area has been demonstrably influenced by the outcomes of ADN and EP conducted among various stakeholders and interest groups. The current realisation of the area is a combination of the best-rated scenarios (i.e., planning variants that were presented in the EP) and are completely different from the realisation suggested by planners at the time the EP was conducted (Scholz et al., 1996)

At present the Lundby Case Study has not yet needed to proceed to the formal negotiation period despite the clear differences in criteria weightings and preferences that have been detected. This is mainly because of the fact that the magnitudes of the commonalities that have also been detected (as in the case of council and residents desire for further investment into local squares) have been of greater importance. This in itself can be of benefit insofar as an impetus is provided to the policy formation process. The EP also allows a closer examination of preferences for various situations. This is achieved by decomposing preferences into criteria, scores and weights, thereby revealing the preference structures of participants.
6.2 Bridging the policy-behaviour gap

The policy-behaviour gap refers to the difference between assumptions underlying policy measures and the resulting observed behaviour (Maat & Louw, 1999). This gap may arise due to poor implementation of the policy but it is important to keep in mind the fact that successful implementation does not guarantee the intended policy effects. There may be other unintended side effects or there may be tensions between various policy aims. Maat (2002) provides an example of this with an account of the Dutch government’s housing programme. Briefly, the policy offered subsidies encouraging the building of new private sector housing (aiming to release cheaper housing for lower income households dependent on government rent contributions) that had a density of at least 30 dwellings per hectare. This was done so as to ensure sufficient patronage for public transport services, which were to operate at no less than 50 per cent of cost.

Yet, the programme’s success was dependent on the desire of residents to move into the new areas. This failed to occur, presumably because people preferred green, suburban developments with easy car access to urban residential settings. These neighbourhoods are not compact and therefore public transport investment has not eventuated. Maat (2002) concludes that the spatial and mobility objectives of the Dutch government’s policy were incompatible with the goal of promoting private-sector housing.

The point being made is that with the case study method used in the present study entailing ADN and EP, it is possible to identify when a policy is in conflict and when it may not have the desired consequences. More importantly, it may potentially suggest when an alternative policy may be required as a necessary first step, such as when new neighbourhood areas are being developed as in the Lundby Case Study. For example, the need to change public attitudes with respect to living preferences (as revealed in an EP) would be an appropriate prerequisite to the implementation of the Dutch government’s compact city policy. Gärling et al. (in press) provide both a general discussion of the role of public attitudes and attitude change and provide examples related to the travel behaviour context.

6.3 Benefits to the citizen and the democratic process

There has been much debate recently on the benefits of direct democracy, which can be characterised by the fact that, in principle, everyone may participate in the decision making process (Bohnet & Frey, 1994; for a review of the literature on democratic processes and the claimed benefits of direct democracy compared to representative democracy, the reader is directed to Zimmerman & Just, 2000). Frey et al. (2001) claim that direct democracy results in outcomes that are more favourable to citizens compared to situations where there is no option for direct participation. They further demonstrate that direct participation provides utility in and of itself and is associated with greater life satisfaction in the population. This research parallels psychological research that has examined goal and process utility (e.g., Gärling et al., 1996; Kahneman & Snell, 1990) or distributive and procedural justice (e.g., Leventhal et al., 1980; Tyler & Lind, 1992; Van den Bos et al., 2001). In the former domain, research has demon-
strated that the way in which a goal is achieved is an important source of utility independent of achievement of the goal. In the latter, judgements of fairness and justice-involved issues concerning how decisions were made and which procedures were utilised as well as what the decisions or outcomes were.

While it is not appropriate in this paper to argue either for or against direct democracy, it can be said that EP embodies an appropriate instantiation of direct participation. It is not only a means to an end; it is also an end in itself due to the benefits accruing from procedural utility. EP participants were asked on 7-point Likert scales to indicate their opinion of the procedure (anchors: 1-very negative to 7-very positive). The average rating was 5.98 with a standard deviation of 1.17. Although further research is required that specifically examines these issues, it is worth noting that the EP procedure was received positively and there is evidence consistent with notions that direct participation results in positive utility being experienced by those who participate and that it is received positively (and by implication is seen as a fair procedure). Given the importance of process utility and procedural justice, direct participation as embodied through EP may provide a way of increasing acceptance for future urban mobility scenarios (and other TDM measures, in general) both amongst those who like the decisions made and, more importantly, amongst those citizens whose preferred alternative was not selected and implemented.

The EP is a carefully constructed procedure that is labour and data intensive but has the potential to yield a wealth of information with beneficial impacts on the policy and democratic processes. Furthermore, the procedure overcomes many of the criticisms of tokenism often targeted at other attempts to increase participation. In a study by Leach and Wingfield (1999) it was found that the overwhelming type of participation required of citizens by local authorities was passive (e.g. survey- or questionnaire-based). There was little evidence showing the application of methods encouraging citizen deliberation, which they argued implied in-depth debate and knowledge sharing. However, it is claimed that an EP encourages deliberation by placing people in a moderately challenging environment and asking them to make a series of judgements and criteria evaluation. Participants of the EP were also asked to rate the difficulty of the EP procedure on a 7-point Likert scale (anchors: 1-very easy to 7-very challenging). The mean was 4.47 with a standard deviation of 1.77 suggesting that the task was by no means simple and required serious deliberation.

Yet, it is incorrect to assume that greater public participation is a good thing; one needs to consider the representativeness, inclusiveness and relevance of those who participate as was done in the Lundby case study (see also Bickerstaff & Walker, 2001). Additionally, appropriate data collection tools need to be used so that the relevant information is elicited from participants, which then needs to be analysed appropriately (Glicken, 2000). This is why the case study approach outlined in this paper with its detailed methods and trained staff (i.e., the CST) is an indispensable part of ensuring not only that participation in the democratic policy process is achieved but that this participation is of an appropriate standard with results arising out of serious thoughtful consideration and deliberation on the part of the participants.
7 Conclusions

The unabated increase in car traffic witnessed in recent years in the industrialised world has led to a focus on demand-based traffic restriction measures, in contrast to the usual supply-based measures (Bovy & Salomon, 2002). Such travel demand management (TDM) measures can vary in time-scale with the long-range TDM measures often requiring some form of land-use planning. As such it is important that not only commuter responses to TDM measures are assessed, as is often the case, but also that citizen and business preferences for various land-use strategies be assessed.

The present paper presented an application of the ADN/EP methodology as a means to achieve sustainable development (i.e., through long-term TDM measures), set within the context of a case study in Gothenburg, Sweden. The procedure requires deliberation on the part of participants and is therefore an ideal tool for promoting citizen involvement in the democratic policy process. Additionally, the involvement is constructive with many benefits. The results of the case study proved to be very useful and insightful, allowing for an understanding of why certain future urban scenarios are preferred to others both in terms of differences in actor groups and also in terms of criteria weightings. While the later more mediational based stages of the ADN procedure, as applied to the Lundby case study have yet to be completed or required, the evidence suggests that — comparable to the ETH-UNS case studies in Switzerland — practices and solutions with which all parties and stakeholders will be satisfied are possible to implement.

The society facing us today is full of complex long-term decision problems, of which future urban sustainability is but one. As detailed in the present paper, these problems are well-suited to the case study methodology and to the use of ADN, including EP, as the methodology requires the use of scenario thinking and future-sketching, which produce future scenarios that are the result of careful analysis of present trends and plausible future developments. Yet it would be incorrect to conclude that these problems can be successfully solved using methods that only have the benefit of improving the engagement of citizens in societal affairs. That would be missing the point. As Vlek et al. (1999) note:

... without valid scientific support, long-term policymaking can hardly be anything more than collective trial-and error, democratic or otherwise. (Vlek et al., 1999, p. 121).

Rather, the methods described in this paper attempt to describe a means by which to better project potential and expected futures, and a means by which to understand and communicate preferences for these futures in a scientifically rigorous manner so that long-term policies can build upon this information and guide society towards desired and effective — in terms of the sustainability objective — future urban mobility scenarios.
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