TRANSPORT PLANNING: TOWARDS A COMMON AGENDA

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TRANSPORT PLANNING CONTEXT

Across many countries, economic and demographic changes, broadening public policy goals, increased emphasis on accountability, consumer demand and technological innovation are changing the approach to transport. Transport projects are, on occasion, being delayed or rejected by the public due to an absence of support. It is also increasingly recognised that a wide array of travel options is needed to sustain economic growth and that highway solutions do not guarantee economic growth or guarantee equality of access to opportunities and services within urban and rural communities. Further, national planning is increasingly recognising the impossibility of catering for ever more private vehicle use and that innovation is needed in the way transport planning meets widely shared community goals.

In some countries the provision of new highway infrastructure dominates the transport agenda, such as the more than doubling of expressway and other roads in South Korea over the next 15 years. Here the issue is how to manage the effects of such provision particularly when adverse public reaction begins to appear.

Transport planning has also been changing as a result of similar forces across some countries that include:

- Increased competition for public funding at all levels of government;
- Fragmented responsibilities amongst transport authorities, infrastructure and service providers;
- Societal trends that reduce the attractiveness and relevance of traditional public transport services;
- Difficulties to reconcile competing or contradictory transport goals and objectives, e.g. between support for economic growth versus environmental protection versus cost control;
- Vehicle miles of travel increasing faster than population or economic growth;
- Urban sprawl and diffuse travel patterns that impede service by traditional public transport;
- Limited incentives for innovation or risk taking;
- Increasing participation of women in the labour force and increasing home working;
- Growth in the elderly population, single parents, single-adult households
- Change in business structures with increasing outsourcing and just in time logistics;
- Increasing contribution made by transport to global warming;
- New vehicle and traffic management technologies;
- Increased public involvement in decision making (TRB, 1999).

Reflecting upon these trends, the policy framework within which transport planning operates is also subject to numerous competing forces operating within the following domains:

- Transport policy;
- Environmental policy;
- Energy policy;
- Taxation policy;
- Land use policy;
- Other policies such as health.

Where transport networks are well established, transport planning is tending to move towards the management of the networks rather than the provision of new infrastructure. Consequently, the rationale for increasing capacity is increasingly seen as only “buying time”, or that it is impossible

to build a way out of congestion even if it were affordable in environmental or economic terms. As a result new investments are being judged by their network-wide effects rather than as individual projects. Also, as management of a network rather than new build begins to dominate transport planning, so the environmental impacts associated with land take become subservient to both physical and social impacts associated with movement.

These trends suggest an increasingly integrated approach to transport planning in which transport serves to meet community objectives (growth, equity, employment, protecting health and the environment), rather than its own self serving objectives. After all transport is a means to an end and not an end in its own right. This means that transport projects should be assessed by their contribution towards sustainable development (jobs, communities etc) instead of growth in mobility or reductions in congestion.

As transport planning becomes focused upon the needs of the users rather than those of the infrastructure or service providers, so the accessibility and impacts upon all social groups and transport's contribution to wider societal objectives become important considerations to monitor. Under this new paradigm new measures of efficiency become not only multi-modal with a focus upon the entire transport system, but also more focused on social and environmental needs.

Across Europe and North America there has been an increased attention given to multi-modal studies that set the context within which transport measures (demand management, traffic management and new infrastructure) are conceived. This is however, not the case across all countries. For example, in Germany the Federal Transport Infrastructure Plan (FTIP) has the task of choosing between about 2,000 infrastructure measures proposed from lower tier plans. While at the state level, a transport plan has to deal with approximately 500 projects. The German bottom-up approach to planning perhaps inhibits integrated and sustainable transport. Top-down approaches however, such as in Spain, experience difficulties in cascading new policy directions into the plans and direction of projects of the highway authorities.

The main objective of Strategic Environmental Assessment (SEA) is to provide a robust analysis of the contribution that transport policy and proposals make to each of the main relevant goals of government, highlighting outcomes, conflicts and trade-offs. Assessments need to illuminate the issues and propose ways forward, providing a mechanism for delivering consensus among stakeholders on the nature of the problem, the alternatives available and the preferred solution. This is no easy task, but one in which transport planning may be more capable of addressing than perhaps some of the other development sectors such as land use planning, given its tradition in dealing with alternatives.

At the Prague Council of the European Conference of Ministers of Transport in 2000, the Ministers agreed to a common approach to developing sustainable transport policies (ECMT, 2000) that highlighted the need for improved support for decision making on transport projects and policies. The importance of good cost benefit analysis and effective SEA was stressed and guidance sought on developing better procedures and tools for presenting the results to decision makers. Improved decision making was seen as being key to integrating transport and environment policies (ECMT, 2004).

TRENDS

Given this context into which SEA is being integrated the following trends can be identified on the application of SEA to transport planning:

- Context for SEA;
- Legislative frameworks;
- Process or methodological integration into transport planning.

Context for SEA

In addressing the new paradigms, transport has responded with an array of strategic multi-modal studies and policy studies such as road user pricing. As a consequence, these have required transport planners to consider issues such as justice and equity alongside economics, safety and soft and hard transport responses. Hence multi-criteria approaches that recognise these wider considerations have emerged. This has provided a suitable context within which SEA can function. As a result we have seen the voluntary adoption of SEA type approaches across Europe and in North America (ECMT, 2004). Countries expanding their transport networks have seen the value of strategic assessments, such as South Korea in reducing delay and conflict (Lee, 2005). Hence better transport planning and SEA could provide a means by which questions not addressed in EIA could be answered.

Given the different reasons for strategic transport planning and assessment, it is not surprising that SEA processes differ between those countries with fully development transport networks and countries where core networks are being established.

In countries with mature transport systems, the management of capacity calls for a multi-modal approach and clearer links with spatial planning. Hence successful SEAs are likely to emerge with recognition of the complex relationships that need to be harnessed to manage transport demand and deliver community objectives.

Where countries are establishing transport networks, SEA should help test the transport objectives of the proposed projects and define alternatives. It should also open, or be a vehicle to debate the provision of new transport infrastructure where such an opportunity has not previously existed.

In both contexts, SEA should help expose some of the traditional transport – jobs/economic objectives to greater public critique and the generation of alternatives beyond the remits of individual transport infrastructure and service providers.

Legislative frameworks

As noted earlier, legislation has not been a driver for strategic studies and countries such as Switzerland have adopted sustainability appraisal or other studies to support their transport planning practice (Hilty, 2005). However, within the European Union transport is identified as a sector formally requiring SEA.

Thus far it appears that England will be the first country to see widespread delivery against the regulations implementing the SEA directive as over 70 local transport plans and Environmental Reports will be produced before July 2006. These SEAs are undertaken for metropolitan authorities, urban authorities and rural counties comprising several lower level authorities. As a result there will be considerable variation in the transport problems and planning contexts in which the SEA is to be undertaken, albeit in accordance with the same legislation and Government guidance. An interesting issue will be to judge the extent to which the SEAs diverge in their approaches – whether they reflect local context or strictly observe the legislation/guidance to minimise fears of legal challenge.

Process or Methodological Integration into Transport Planning

A central thread in the Directive is that duplication of assessment should be avoided. Hence transport planning and environmental assessment should be fully integrated in multi-modal transport studies and transport plans. There is however a cautionary note. The disadvantages of cost benefit analysis – a favoured tool in transport planning - and multi-criteria-analysis methods is that they all to often give the appearance of producing precise results and focusing the decisions of politicians upon a small number or even a single value. As a result, they tend to ignore uncertainties and assumptions that underlie such methods.

The balancing of issues is the task of the politicians, not the authority, nor the consultants. Unfortunately, some assessment tools lead to a degree of integration that masks the real conflicts that should be explored in the decision making process. The techniques reduce the array of issues to a single or small number of values to be reported, using aggregation methods that are often at best opaque and sometimes ignored.

While SEA must be integrated into the process of transport planning, it should strive to make these conflicts visible and to show the consequences of any decision rather than be subsumed within a highly numerical approach to the analysis.

ISSUES FOR SEA TO ADDRESS

The following issues have been identified for SEA practitioners to consider in dealing with transport planning:

- Tiering;
- Assessment tools;
- Participative processes;
- Objectives-led or evidence based approaches;
- Alternatives;
- Significance criteria;
- Strategic mitigation;
- Monitoring significant effects;
- Linking SEA to EIA;
- Independence or integration;
- Integration of SEA with economic appraisal.

Tiering

Tiering, in which topics are assessed in different plans is raised as a solution to the complexity of assessment at higher planning levels. Here topics are only considered that are appropriate to the planning tier and the levels of uncertainty that are acceptable to the decision making process.

Transport planning may comprise national plans, regional and local plans as well as EIA projects and non-EIA projects. Transport plans are also key components in other plans such as spatial or land use development plans. Consequently, SEAs prepared for transport planning should be effectively linked with those undertaken at different levels in transport planning and with those prepared for spatial planning and other sectors.

With different administrations, devolved responsibilities and different spatial scales, the task of providing effective integration is challenging. Apart from creating links across administrative boundaries and topics, the allocation of issues to an appropriate tier in the plan and project planning processes is also a challenge if duplication of effort is not to result.

The transfer of issues from one assessment to another must be undertaken in a transparent manner, as there is a risk that some plan assessments abdicate responsibility for particular issues instead passing them to other plans. There is also the question of how to deal with the impacts from a transport plan on say a river basin management plan, where the transport interventions may give rise to only a slight impact individually, but cumulatively they could cause major problems. Is it appropriate that such potential issues are handed over without the transport assessment having some recognition of the potential consequences? Clearly there is a danger in a lack of overall transparency and accountability in the tiering of plans and assessments.

Assessment Tools

Aside from the procedural and administrative aspects of incorporating SEA into transport planning, the assessment tools need to be fit for purpose. Some guidance has sought to apply project level assessment tools to strategic studies with mixed results, while others tend to be broad brush providing little meaningful assistance to the plan making processes. While expert opinion is of increased importance in SEA, statistical analysis should not be neglected. Expert opinion should be supported by evidence that can be defended at public hearings.

Transport planning is frequently a highly numerical process placing reliance upon transport models and cost benefit analysis. While quantification is generally a desirable activity, in the context of SEA, it can distort assessments as:

- Numbers often hide the fact that they are based upon value judgements that have not been subject to external review;
- Having a numerical value can give rise to a perception of accuracy that can be misplaced;
- It tends to devalue qualitative assessments;
- Monetary valuation techniques often only capture a fraction of the issues associated with the environmental impact. For examples, the monetisation of noise based on its effect on house prices assigns zero value on noise levels in those places where no one lives.

Notably motivated by this criticism, Borken (2005a) presented a flexible multiple criteria approach that explicitly accounts for uncertainties and diversity of stakeholder opinions. This outranking approach seems particularly suited to lead stakeholder involvement and to identify compromise in the light of diverging values. All issues that are considered relevant by the stakeholders can be taken up, be it in quantitative or qualitative terms.

Also evident in some countries is the reliance of GIS to drive the SEA. Essentially, GIS functions as a modern day McHarg overlay map from the late 1970s.. However, behind the GIS manipulation are issues associated with the rules for adding together different mapped constraints. Such techniques adopt weights for each layer corresponding to a different mapped constraint to enable aggregation to define the “preferred route. As a result, these techniques produce the “least-worst” option rather than the best option.

As the qualitative aspects are missing from GIS methods, so uncertainty and risk management practices are omitted as well as non-mapped information. Consequently, the solutions fail to consider the ease at which adverse effects can be resolved and the contribution that enhancements can make to select the preferred option.

An alternative method that is amenable to both qualitative and quantitative approaches is that of causal links analysis or system maps. This approach was used in the Spanish Strategic Infrastructure and Transport Plan (Jiliberto, 2005). Indeed, as noted in that presentation, qualitative system models are powerful tools that can explore the structural underpinning of the environmental profile of the transport plan, allowing an appreciation of the relative intensity of the relationship between the action and the effect.

Participative Processes

To be effective, SEA should be embedded in the transport planning process. To deliver this outcome several steps are important. These include:

- Officers responsible for plan-making are actively involved in the SEA in a timely and constructive manner;
- Members should be involved in agreeing the environmental objectives;
- The public should be given adequate opportunity to contribute to key stages of the assessment in a seamless manner with that of the opportunities that plan formulation provides;

- Assessment professionals should not constrain reporting to that of the Scoping Report and the Environmental Report, but instead should identify the elements in the transport plan-making processes in which contributions can be made.

When dealing with the public several questions arise as noted by Borken (2005b):

- How to pass from passive to active involvement?
- How to maintain the participation?
- Who are “the public”?
- Are all members of the public/stakeholders concerned in all phases of the impact assessment?
- Do the public need to be organised by representatives?
- How to manage diverging opinions in participation?
- How to deal with interests groups?
- How to deal with planning blight?
- How to find “truth”?

These are not so much SEA issues, but wider issues of public engagement in democratic planning systems. Nevertheless, assessment professionals need to be familiar with the questions and possible strategies to be promoted. Further, assessment professionals need to adopt good practice and deliver (cf. Alton & Underwood 2005):

- Transparency of the process;
- Accountability: You need to know, which intervention was taken up where? Demonstrate take-up and link with decision;
- Equal role and voice of participants;
- To realise this in practice, participation should go along with empowerment of the participants;
- Develop criteria on how to derive conclusions, what to accept as a conclusion/decision and when to summarise or to continue the process.

Objectives

Establishing the regional economic development, environmental and community objectives that transport projects are intended to provide at an early plan-making stage is critical if risks of delays and revisions to the projects are to be minimised. To achieve this, political decision makers should play an integral part in the process of defining problems and community objectives that the plan is to address. Transparent mechanisms that integrate wider economic, social and environmental issues into the plan and project formulation processes are therefore needed.

Objectives-Led or Evidence Based Approaches

SEA has been seen to be either data led – demanding large databases, or objectives-led – where reliance is based upon pre-defined indicators offering consistency of approach. An alternative may be termed evidence-based in which knowledge is to be used to identify significant impacts. These different approaches are rather academic models than practical realities. Nevertheless they do set the context for procedural, technical and cultural issues associated with SEA.

At the centre of this aspect is whether the objectives are defined in advance of an exploration of the potential environmental impacts associated with a plan. Where the plan is dominated by policies rather than projects, then using objectives set in higher level or associated plans is generally an appropriate approach. However, where there is a higher project content, an objectives-led approach is not guaranteed to identify all significant effects, particularly when the objectives and associated indicators are required to be in conformity with other plans.

An evidence-based approach relies upon an exploration of the potential impacts of both policies and projects before defining the objectives and potential indicators. However, it is critical that this

exploration does not descend to EIA levels of assessment. Where plans contain some project content, such projects are often founded in some level of prior assessment which the SEA can exploit. Through this approach the SEA aggregates knowledge on the likely environmental consequences of the projects with the assessment of the policies and is thus more likely to report the significant environmental effects in a more robust manner than objective-led approaches.

Alternatives

SEAs face the challenge of delivering an appropriate amount of information on the environmental performance of alternative transport strategies being considered in the plan. Unfortunately, plans do not commence as a blank piece of paper. There is often a series of constraining factors imposed by:

- Higher level plans;
- Government regulations/guidance on the plan being assessed;
- Previous plans for the locality;
- Earlier studies such as multi-modal studies, prepared to inform the plan being assessed;
- Decisions and interests of the elected members;
- Other sectoral plans;
- Major transport and other projects in the planning process.

It thus seems spurious for the SEA to generate new alternatives for decisions that have previously been taken. Nevertheless, alternatives may exist in relation to the range of policies if not the broad transport strategies. Also, alternatives may exist on the scheduling of the transport projects, such as delivering public transport measures ahead of new road projects as well as on the location of infrastructure proposals.

This transition period before SEA becomes fully embedded may result in superficial assessments that are “add-ons” to the transport planning process that do not adequately deal with alternatives. Apart from failing to add value, such assessments also bring the process into disrepute and create opportunities for legal challenge.

Significance Criteria

The process of identifying significant environmental impacts, particularly cumulative impacts, is key to both the scoping of the assessment and the importance attached to the impacts that are identified. It appears that in order to avoid legal challenge assessments are not being subject to meaningful scoping exercises. Indeed the topics, and the way they are being addressed, are not being defined in a way that provides a focus to the assessment.

Further, the desire to “cover all the bases” results in the assessments that report any impact whether or not it is significant. This “bottom-fishing”, then generates excessively long reports that risk failing to communicate to the decision makers the key assessment findings.

How significance criteria are developed for individual impacts and the mechanisms by which the individual impacts are aggregated to provide scores across the alternative strategies, also merit attention (see Tomlinson, 2004). This also raises issues of quantification and monetisation techniques. For example, where multiple areas of ecological interest are affected, what is the basis on which a slight or moderate adverse significance is assigned to the overall effects? Are all affected ecological sites of equivalent worth? Can adverse impacts in one area be “traded” with beneficial impacts in others? These issues need to be explicitly considered in the Environmental Reports if SEA is to be seen to be rigorous and robust.

Strategic Mitigation

SEA provides new opportunities for mitigation in that measures need no longer be conceived as bolt-on to the project design. Instead, longer term mitigation can be undertaken, perhaps with mitigation remote to the project being both more financially and environmentally beneficial than the delivery of measures local to the project. For example mitigation banking may be regarded as a more financially and environmentally efficient approach. Also, SEA creates opportunities for organisational or institutional change or advanced data assembly offering new means of avoiding or minimising significant impacts.

Monitoring Significant Effects

The SEA Directive makes it a requirement to monitor significant environmental effects resulting from the plan. This raises issues of what to monitor, how to detect trends and attribute effects to specific causes given natural and induced environmental variability. Then there are the organisational aspects of data assembly and management not just for single plans, but coordinated across all plans operating in an area that need to be considered.

Often plans have annual monitoring programmes to meet the reporting requirements of government. Such annual progress reports may be using standardised indicators and reporting metrics dictated by government in order to deliver comparability across the plans. The challenge will be to extend these indicators with those that track significant environmental effects both predicted and unforeseen.

Linking SEA to Projects

How SEA interacts with EIA is a key aspect if the burden of assessment is to be lightened and if the environmental benefits of SEA are to be realised (Tomlinson and Fry, 2002). For transport planning this could mean that certain types of project no longer require an EIA, as the SEA establishes that no significant effects are likely. To lighten the burden of project EIA would require national regulations to recognise the existence of SEA and to allow the SEA, as well as EIA thresholds or lists, as a means to screen EIAs.

Also in the spirit of lightening the burden, SEA could better define the scope of the EIA so that they may be undertaken more efficiently. Hence, the Environmental Report could contribute to the EIA scoping activity by identifying key issues to be addressed as well as those that should be confirmed as needing only a less detailed level of assessment.

One of the reasons for undertaking SEA is to consider the cumulative effects of all transport interventions, and as a result SEA should consider EIA and non-EIA projects. It is therefore appropriate for the SEA process to assist in the specification of non-EIA projects.

Perhaps the greatest benefit would be the delivery of a clear set of environmental design objectives within which specific transport projects must conform. Having such a set of specific objectives defined in advanced could help to replace the mitigation culture with one of impact avoidance and delivery of enhancements.

Independence or Integration

Linked with communication is the task of safeguarding the independence of the assessment where the plan making authority is also responsible for the SEA. This is a situation that does not normally arise with EIA. In France, credible independent institutions are able to act as arbiters (ECMT, 2004), while in the Netherlands, separation of stakeholder consultation from expert appraisal is viewed as important. A key issue is how to ensure the objectivity of the assessment and avoid

similar failures to those of the early EIAs? The need for independent advisors in Switzerland was highlighted in a presentation by Hilty (2005).

Integration of SEA with Economic Appraisal

It is becoming recognised that a single measure of economic efficiency as a means of making decisions is flawed and many countries are incorporating multi-criteria analysis. This is particularly important, as a focus on economic efficiency does not assist in fully understanding the distribution of the costs and benefits. Options that are equally economically efficient may result in a very different distribution of costs and benefits. As a result of SEA, it should be less likely that scarce financial resources are wasted, allowing more cost effective delivery of objectives. Questions as to how to integrate environmental and economic appraisal activities throughout the transport planning process will undoubtedly arise.

Conclusions

The introduction of SEA to transport planning is envisaged to be somewhat easier than other sectors given its tradition in the evaluation of alternatives. Nevertheless, efforts are needed to fully embed SEA into transport planning. Indeed, efforts are needed to ensure that SEA is not regarded as a waste of time and an administrative hurdle that must be jumped. It is important to recognise that the additional resources being spent on SEA represent an additional overhead to the transport authority. As a result, it should deliver what is intended, namely an increased likelihood of sustainable development. Failure to deliver a real benefit would result in an overloading of the system and a waste of public resources that perhaps would be better spent on downstream environmental enhancements/mitigation or on health promotion.

It is vital that the assessment community recognise their role in delivering tangible benefits for the resources being allocated to SEA. To deliver achieve this it can be beneficial to link the procedure up with health, social and possibly also economic assessments.

While tiering is a nice theoretical concept, the paper by Arts, Voogh and Tomlinson (2005) indicates that practice is somewhat divergent from theory, often because of discontinuities in assessment procedure and subject, personal and administrative responsibility, timing and spatial frame of the process, non-aligned planning, etc

In seeking integration with the transport plan-making processes, the assessment professional must recognise the existing culture and pressures upon the plan-making professions. In the context of transport planning, it is the belief in numbers; difficulties in re-opening old ground in which alternatives have been foreclosed and establishing meaningful integration present the challenges. In particular, the following methodological, procedural, technical and cultural issues merit particular attention:

- **Devising and assessing alternative strategies in transport plans:** How are strategies devised, what level of detail, who is involved, how the boundaries with other plans and jurisdictions are handled?
- **Integrating SEA into other assessment activities:** How to bring economic, social, health and environmental assessments together at the same plan level and provide integration between SEA and project EIA?
- **Stakeholder involvement in defining the problem and objectives:** How to engage the public when they tend only to become involved in transport planning when projects directly affect their interests? How to manage bias, conflicts and interventions from pressure groups?
- **Assessment tools for SEA:** Are we properly equipped with tools and techniques for SEA? How to ensure GIS is used in its correct role? Are more appropriate tools needed for an integrated assessment or shouldn't the process merit closer attention? At what stage of the

process are qualitative procedures best, at what stage quantitative? How to aggregate impacts for strategies with multiple transport measures? Can environmental capacity be defined?

- **Communicating the assessment:** How to keep the assessments meaningful for the different audiences yet technically robust? What is the best way to communicate the inherent uncertainties?
- **Quality control in SEA:** Is it an issue when the plan maker is also judging the SEA and its mitigation/monitoring requirements? What rules are needed for significance criteria?
- **Changes to transport planning:** How will SEA change the culture of transport planning, will the American model be followed? Can SEA only be successfully implemented, when current planners and decision makers have fundamentally opened up their routines and thereby changed the planning culture?

While transport is perhaps better placed to accommodate SEA, the key task remains to deliver the change in the culture of transport planning so that problems are better understood and sustainable transport is delivered. Key to this will be more effective and open mechanisms for involving the public, a willingness amongst transport planners to accept the legitimacy of the view of others and the need to address objectives beyond those of road safety and reducing congestion and eventually also accepting absolute limits e.g. of the environmental carrying capacity.

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