International Transport Forum

Policy Brief

April **2012**

▶ Seamless Transport

Making Reliability Part of Transport Policy

Most of us face unreliable travel services in our daily lives. Unexpected delays make us miss a train or arrive late for work. Whether for business meetings, social events or deliveries of goods, reliability is a key quality of seamless transport. A review of policies in OECD countries shows, however, that only few countries explicitly incorporate reliability into transport policy making. Research at the International Transport Forum at the OECD shows that:

- **A wide range of instruments is available to manage reliability and the policy framework proposed distils these into four principal options (Provision, Information, Management, Pricing);**
- **In order to deliver the most cost-effective reliability option, reliability should be incorporated into cost-benefit assessments;**
- **Reliability targets need to be applied with caution;**
- **Unreliability of transport constitutes a significant cost;**
- **Reliability is highly case-specific but improving reliability adds anything between 10% to doubling the project benefits.**

Technological advances and investments in infrastructure have lowered transport costs and increased average transport speeds. Supply chains are, more than ever underpinned by global and, often, just-in-time production and distribution systems. Time has become a critical factor and timely delivery of components has replaced traditional stock-holding. Broadening trade links have brought greater volumes of goods, moving further and in increasingly complex and interdependent way. This complexity is echoed in passenger movements which have also become more complex with changing patterns of employment, increased disposable income and leisure time. These changing patterns have increased the importance of schedules – and of keeping to those schedules, putting a premium on transport reliability.

▶ **Increasingly complex scheduling places more importance on reliability**

Unreliability makes journeys frustrating and causes stress. The feeling of travelling without control over one's travel time is a disempowering experience, and bad experiences are remembered by travellers. Individuals, companies and infrastructure managers affected by unreliability respond in a number of ways; individuals build extra (buffer) time into their journeys to allow for the possibility of delay; companies adapt their pattern and timing of operations or

▶ **Users build "buffer" to deal with unreliability**

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build in a buffer stock of goods; infrastructure managers often provide traffic flow information to reduce the impact of unreliability.

Costs of unreliability may rival those of congestion

Research at the International Transport Forum at the OECD suggests that costs incurred as a result of unreliable transport may rival those generated by congestion. A delay may have ripple-effects or snowballing effects, affecting other activities or stages in the personal or logistics chain, constituting a cost to those involved. A delay at one stage in a person's schedule of activities can mean delays in later related, or unrelated, tasks. Similarly, while logistics chains are built in such a way as to reduce their vulnerability to individual events, any delays in individual consignments can still reverberate through the chain. Because the transport task is part of a chain, a break in any part of it is a break in the entire chain. An assembled television set with only 99 of its 100 components is an incomplete product that can be neither shipped nor sold.

PIMP your transport policy

A wide range of instruments is available to manage reliability. The policy framework proposed in a study by the International Transport Forum at the OECD distils these into four principal options:

Provision: Infrastructure design and construction can incorporate reliability options. Increasing the physical capacity of infrastructure and improving supply-side reliability entails reducing the probability of an unexpected disruption in service. This can be achieved either through supplying extra capacity or improving the quality of existing capacity. Capacity enhancements are generally costly, time consuming and often politically difficult. Setting appropriate network standards and improving the robustness of infrastructure (for instance, durability of material) also influences reliability;

Information: Information may be used in different ways to improve reliability depending on whether a traveller has left the origin, whether a traveller can divert to another route, or if the traveller cannot divert but can reduce the ripple effect (consequences). Different tools exist for delivering information to users enabling them to mitigate the adverse effects of poor reliability. This can be a cost-effective way to reduce both unreliability and the impacts of traffic incidents on subsequent business and personal schedules.

Management: Better utilisation of existing capacity can facilitate reliability, just as poor management can increase unreliability. Infrastructure managers can improve reliability through better incident management and appropriate scheduling and publicising of maintenance work. The core management skills can be supplemented by pro-active network oversight.

Pricing: Charging directly for reliability can be used to achieve more efficient levels of reliability. Charging for the use of transport networks, or portions thereof, is becoming a more common method of managing traffic demand, and consequently traffic flow and network reliability. However, it is often difficult to provide different levels of reliability according to the value different users place on reliability, and equally difficult to extract different charges for differential performance.

Choose the low-hanging fruit

A key policy challenge is to create incentive structures that encourage selection of the most cost-effective reliability option – the option that delivers a given level of reliability improvement for the lowest cost. The objective is to ensure that option is chosen ahead of the less effective options, regardless of whether the responsibility for adopting the option lies with the network provider or the network user. Indeed, reliability improvements can be delivered by both users and network providers. It should not be presumed that the infrastructure (or service) provider/government always has to be the source of reliability enhancements. The low-hanging fruit of cost-effective reliability improvements may come from network users.

A cost-benefit assessment (CBA) framework provides consistency in assessing the societal pros and cons of policy interventions in terms of their positive, or negative, effects on reliability. Incorporating reliability into CBA encourages proper consideration of options for delivering appropriate levels of reliability. Projects designed to deliver congestion reductions are sometimes credited with generating reliability benefits. However, standard appraisals fail to unbundle improved reliability (reductions in travel time variability) from the benefits due to the reductions in average travel time. This omission removes the factual basis for arguing that a project really does improve reliability.

Examples from current practices show that it is possible to take into account reliability in the CBA. These approaches provide a foundation for explicitly incorporating reliability benefits into investment appraisals and, consequently, policy frameworks. Incorporating reliability into CBA requires, in principle, three sets of data:

- Existing travel time reliability, defined in minutes;
- Anticipated reliability level, in minutes, after a change in policy or an investment;
- Monetary values of reliability, disaggregated at the appropriate level.

Avoid simple mark-ups and double-counting

A range of reliability values is required to reflect the different major user groups. It is difficult to generalise about the value of reliability as it will be project, location, user, and time-specific. For one project studied, the value of improvements in reliability were found to be negligible, whereas for another project they were found to add 25% to the welfare benefits of time savings achieved. It is important to recognise the importance of disaggregating user values of reliability — the "granularity" of reliability. Different values are placed on reliability by different network users at different times and for different trip purposes. Therefore, a single monetary value for reliability will be of little, if any, use in project appraisal. Practitioners cannot assume that values used in one study are readily transferable to a project in another situation. It is also important to avoid potential double-counting when factoring reliability into project assessment. This can arise if the standard values of time used to assess average time savings already have an implicit, crude value for reliability incorporated in them.

Apply reliability targets with caution

Most of the existing reliability targets can be found in the rail and aviation sectors, transport modes that seek to run to strict timetables. Governments usually oversee supply by monitoring and setting performance standards. Punctuality statistics provide bellwethers for regulatory monitoring and establish a degree of accountability in relation to service quality. Reliability targets and performance indicators for services and infrastructure performance can facilitate discussions between users, operators and decision makers regarding the right levels of reliability. But employing fixed targets may be distorting as they can dominate other service characteristics that may be of equal, or greater, importance. Reliability targets need therefore to be carefully coordinated with other key performance indicators. Such targets also invariably present an average level of reliability not reflecting diversity in the demand for reliability.

There are also trade-offs to be made. For instance, a rail infrastructure manager may enhance reliability by reducing the number of trains that it operates. The improvements in reliability may then come at the cost of a more limited train schedule and higher overcrowding on the trains. Indeed, the incentives that the targets create in relation to other policy goals and the overall efficiency of transport systems need regular review.

▶ **Significant benefits**

Robust and consistent reliability assessments can be developed. Their deployment is important for informing decisions on achieving more optimal levels of reliability on surface transport networks, and for the selection of cost-effective policies and projects. Reliability is unanimously regarded as a desirable transport network attribute and travel time reliability has been found to be an important factor when it has been incorporated into cost-benefit assessment. The importance of reliability is highly case-specific but some recent studies found that incorporating reliability added anything from 10% to doubling the estimated benefits achieved.

- **Read the full OECD report here**
- **Read the Executive Summary here**
- **Presentation: Incorporating Reliability into Cost-Benefit Assessment: State of Practice and Recent Developments**
- **International Meeting on Travel Time Reliability - World View and SHRP2**
- **International Workshop on Value of Travel Time Reliability and Cost-Benefit Analysis**
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