**Accessibility measures: review and applications. Evaluation of accessibility impacts of land-use transportation scenarios, and related social and economic impact**

**Funding:** National (Netherlands)

**Duration:** Jan 1999 - Jun 2001

**Status:** Complete with results

**Background & policy context:**

This project was part of a project of a PhD project.

**Objectives:**

The study aimed to analyse the capacity of accessibility measures to evaluate the accessibility impacts of national land-use and transport scenarios, and related social and economic impacts.

**Methodology:**

A two-part approach was chosen to meet the aim of the study. Firstly, an extensive literature study in which accessibility measures are reviewed according to their:

1. theoretical and methodological soundness;
2. interpretability;
3. data need;
4. capacity to be used in evaluations of land-use and transport changes, and related economic and social impacts.

Secondly, activity- and utility-based accessibility measures are computed in case studies aimed at analysing their capacity for evaluating accessibility impacts of land-use and transport changes.

**Parent Programmes:**

**RPB - The Netherlands Institute for Spatial Research (various projects)**

**Institute type:** Research agency

**Funding type:** Public (national/regional/local)

**Partners:**

PBL - Netherlands Environmental Assessment Agency

**Organisation:** PBL - Netherlands Environmental Assessment Agency

**Address:** Postbus 303

**Zipcode:** 3720 HA

**City:** Bilthoven

**Contact country:** Netherlands

**Telephone:** (+31) 30 274 3918

**Fax Number:** (+31) 30 2744479

**Key Results:**

The report identifies three basic perspectives on measuring accessibility:

1. Infrastructure-based accessibility measures founded on the observed or simulated performance of
2. Activity-based accessibility measures founded on the distribution of activities in space and time. Two approaches are seen in urban planning and geographical studies: (i) 'geographical' measures, representing accessibility at a location (or zone) to all other destinations, the most common being contour measures and potential accessibility measures, and (ii) 'space-time' accessibility measures, representing the potential of activities in which individuals can participate given (predefined) time constraints;
3. Utility-based accessibility measures founded on the benefits people derive from access to the spatially distributed activities.

Four (interdependent) components determining accessibility are also identified:
1. A transport component, reflecting the travel time, costs and effort to travel between an origin and destination location
2. A land-use component, reflecting the spatial distribution of (supplied) activities at destinations (e.g. jobs, schools, shops) and the demand for those activities (e.g. workers, pupils, inhabitants)
3. A temporal component, reflecting the time restrictions of individuals and availability of activities at different times of the day
4. An individual component, reflecting the needs, abilities and opportunities of individuals.

Infrastructure-based accessibility measures focus on one element of the transport component, e.g. average travel time or travel speed. Activity- and utility-based measures usually incorporate travel distance, travel time or costs as transport elements. The contour measure does not incorporate an impedance function to weigh opportunities according to their travel time or cost away. This has the methodological disadvantage that one incorrectly assumes that all opportunities are equally desirable, regardless of the time spent in travel or the type of opportunity accessed.

Infrastructure-based accessibility measures do not incorporate a land-use component, in contrast

**Technical Implications**

N/A

**Policy implications**

The current Dutch practice of evaluating the (infrastructure-based) accessibility impacts of (land-use) transport projects, plans or scenarios can be improved by estimating activity-based accessibility measures, using existing land-use and transport data, and/or models.

Activity-based accessibility measures are very well able to analyse accessibility impacts, satisfactorily incorporate the different components of accessibility (i.e. the transport, land-use, temporal and individual components) and serve as a useful tool for analysing social impacts.

Utility-based accessibility measures may provide a useful basis for economic evaluations of land-use transport scenarios, but further research is necessary to analyse the added value to existing evaluation methods.

**STRIA Roadmaps:** Other specified

**Transport policies:** Societal/Economic issues