

Summary

Improvements in accessibility can contribute to the competitiveness of a region or country, because improvements in travel times and reliability have a direct effect on the productivity of companies. Under certain circumstances, a limited additional competitiveness effect can occur as a result of the operations of freight and service sector markets and the labour market, and due to agglomeration effects. In the stage where accessibility issues are explored and selected, a decision tree and checklist can help indicate the effect that improvements in accessibility have had on competitiveness.

Insights into the contribution of accessibility to competitiveness

The Ministry of Infrastructure and the Environment's Directorate General for Accessibility commissioned the KiM Netherlands Institute for Transport Policy Analysis to devise a method for determining the contribution of accessibility to the competitiveness of The Netherlands. This knowledge can be used when considering the various challenges and potential solutions during the research stage of the Multiyear Programme for Infrastructure, Spatial Planning and Transport (MIRT). The MIRT research stage focuses on the early phase of exploring and selecting accessibility issues: an initial investigation of problems and possible solutions.

The contribution that improved accessibility makes toward economic growth is described in various ways. In addition to competitiveness, we also speak of strengthening the economic structure, productivity, and the internationally competitive position of a country or region. In short, the economic structure determines the productivity of a company, region or country. Differences in productivity levels determine the competitiveness of a country and the extent of economic growth. The competitive position is a relative comparison of the performance of a company, region or country.

In this report we used a literature analysis to give an overview of what is known about the relationship between accessibility and competitiveness, and of the associated indicators. This information leads to the creation of a decision tree and checklist that, during the selection of accessibility issues for a region, helps to broadly estimate the effects that accessibility improvements have on competitiveness. The usefulness of this approach is tested and assessed.

Three approaches to the relationship between accessibility and competitiveness

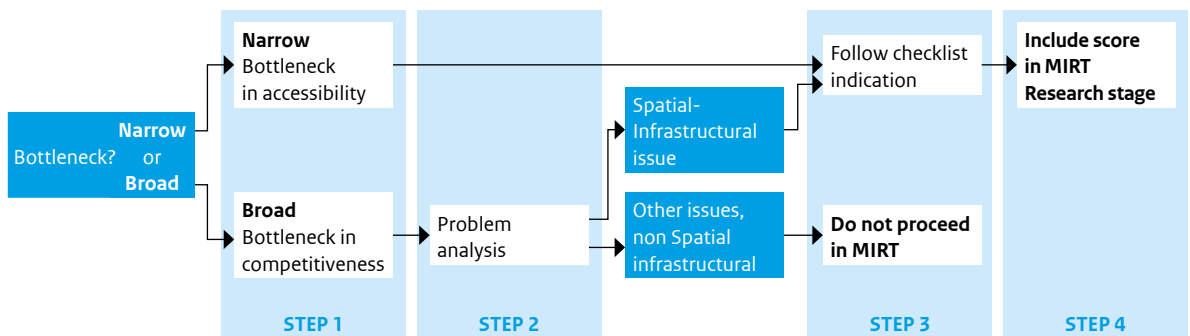
There is a great deal of literature available pertaining to the relationship between accessibility (policy) and competitiveness. Three approaches can be distinguished in the literature: the micro-economic approach, with accessibility as a transport-related bottleneck; the macro-economic approach; and the broader view of spatial planning, as based on location-theory, whereby accessibility is one part of the entire set of location factors.

- The micro-economic approach, which is supported by a social cost-benefit analysis (SCBA), examines projects or measures individually, and expresses the effects in terms of an increase or decrease in national wealth. The effects on competitiveness are equal to the direct effects on accessibility, and any indirect influence that derives from the operations of freight and services markets, and from agglomeration effects.
- In the macro-economic approach, competitiveness is expressed in economic variables, such as added value, revenues and jobs. An input-output analysis provides an overview of the various sectors' deliveries (including transport) to each other, to households, and to foreign sectors as exports.
- In the spatial planning approach, accessibility is one of the factors that play a role in the choices that individuals and companies make for settling in a particular location (or remaining at a location), as is the case in a competitiveness analysis.

Proposal for MIRT research stage: a decision tree with checklist

In an early stage of identifying bottlenecks and possible solutions, such as in the MIRT research stage study, there are no suitable quantitative methods available that can directly establish a link between accessibility and competitiveness. We have therefore developed a pragmatic, qualitative approach: completing a decision tree and a checklist. The starting point of the decision tree is that it has already been carefully considered or the government must have a role in solving the relevant bottleneck.

Figure 5.1 Competitiveness decision tree for identifying accessibility issues

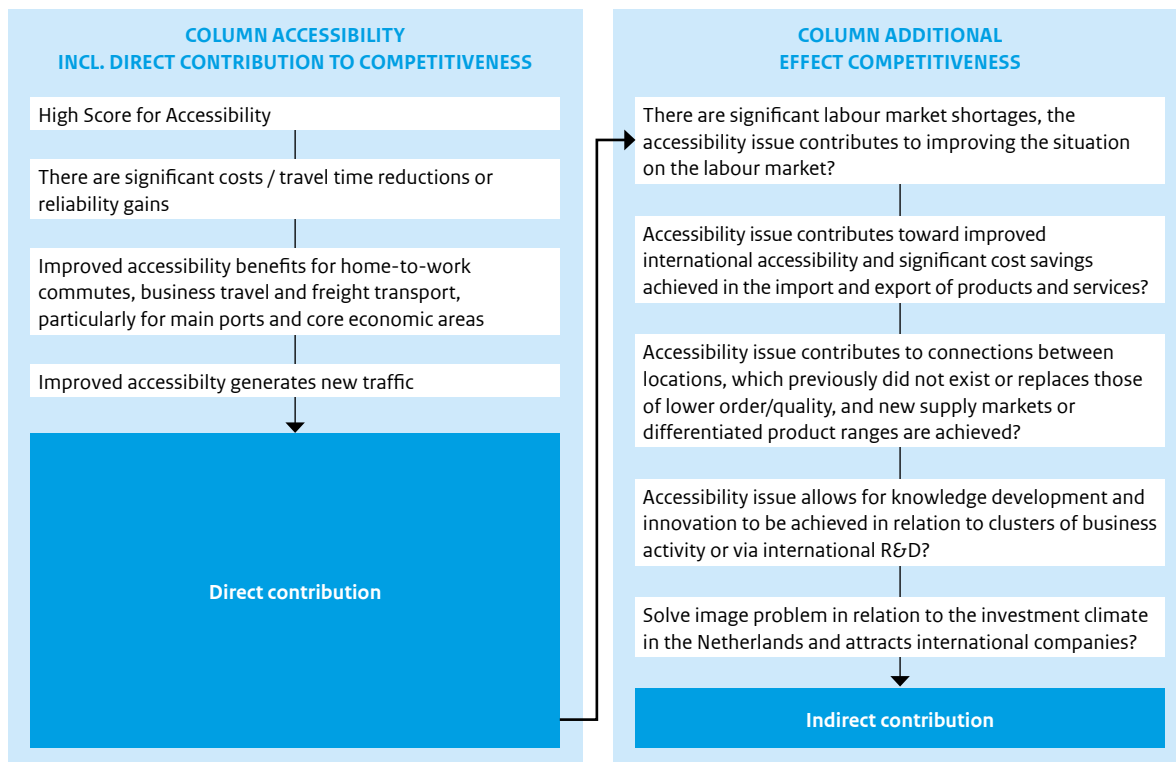


Source: KiM

The first step in the decision tree is to establish whether the matter is solely a problem of accessibility, or rather a more general obstacle to competitiveness that is possibly – but not necessarily – related to accessibility issues. In the latter case, a second step determines whether the accessibility issue is or is not of a spatial-infrastructure nature. The checklist in step three subsequently provides an indication of the scale of the problem, and of a solution's potential contribution to competitiveness.

The checklist assumes that improved accessibility provides a direct contribution to competitiveness, because travel time delays and diminished reliability have direct effects on productivity (the most important catalyst of economic development). This direct contribution to competitiveness is therefore already a part of the measured effects on travel times and reliability. A minor additional effect can be generated by the operations of the freight and services markets, by the labour market, and by agglomeration effects. The impact of these additional effects is much smaller than the direct contribution that accessibility makes toward competitiveness.

Figure S.2 Competitiveness checklist questions and scores in the MIRT research



Source: KiM

The direct effect on competitiveness is primarily focused on improving employees' productivity and optimising the use of capital goods for freight transport. This effect is part of the measured effects on accessibility.

The presence of significant travel time and reliability gains is an essential precondition for an effect on competitiveness. Without this precondition, the contribution that accessibility makes to competitiveness is equal to zero. How large the contribution is depends on the answer to the question of whether the measure is primarily relevant for home-to-work commutes, business travel and/or freight transport. In addition, whether or not the measure generates substantial amounts of new traffic, and in which area the measure is enacted, is relevant information; for example, is it enacted in or in the vicinity of a mainport or core economic area.

If a combination of these conditions occurs, this signifies a direct contribution to competitiveness. Because this is the 'flip side of the coin' of effects on travel times and reliability that are already measured, the contribution cannot be presented as an independent score next to the score for accessibility. The one is indeed part of the other.

In addition to the direct competitiveness effect, which is expressed in terms of accessibility (travel time and reliability gains for home-to-work commutes, business travel and/or freight transport), there is, under certain preconditions, the possibility of a limited additional indirect effect that can be described as an additional contribution to competitiveness. The effects on accessibility can potentially lead to effects on the freight- and service-markets and labour market, and to agglomeration effects, owing to the reduction in transport costs.

KiM has devised a methodology for indicating direct and additional effects on competitiveness in terms of plusses and minuses.

Test step-by-step plan and checklist

To test the decision tree and checklist, a number of examples of accessibility issues for a Dutch region were analyzed. In step one of the decision tree a literature analysis is made of the problems present in the area of competitiveness. This proved to primarily lie outside the spatial-infrastructural domain.

By means of illustration, we have completed the checklist for three accessibility issues, in conformance with the next step in the decision tree.

Table S.1 Illustration of the scores for three examples of accessibility issues in competitiveness

	Example of accessibility issue 1	Example of accessibility issue 2	Example of accessibility issue 3
1. Accessibility score for this accessibility issue (from the accessibility column)	++	0/+	+
2. Determination of direct contribution accessibility makes to competitiveness			
a. Significant costs/trip time reductions or accessibility gains	Yes	?	Yes
b. Benefits for home-to-work, business and/ or freight transport, namely for main ports and core economic areas	Yes	?	Yes
c. New traffic generated by these groups	Yes	?	Yes
Direct contribution of accessibility to competitiveness	++	0	+
3. If yes, determined for special cases in which additional effects can occur.			
a. Labour market effects are expected?	Yes	No	Yes
b. Contribution to international accessibility	No	No	No
c. New supply markets or differentiated product range via a 'missing link' or replacing connections where there is one of lower order/quality?	No	No	No
d. Achieved knowledge development and innovation, relating to clusters of companies or via international R&D?	No	No	No
e. Solution for image problem as relating to the business climate in the Netherlands?	No	?	No
Additional competitiveness effects	+ (+15%)	0 (+0%)	+ (+15%)
Total score for competitiveness (direct via the contribution to accessibility and additional)	++ (+15%)	0	+ (+15%)

The illustrative score for the three examples of accessibility issues indicates the extent to which the improved accessibility directly contributes to competitiveness, and the extent to which there is an additional contribution. If various objectives are considered together, and the contribution to accessibility is presented next to the contribution to competitiveness, only the additional contribution can be included as a competitiveness effect. This is done to prevent double-counting.