



**Indicators to follow up the  
Transport Policy Objectives  
– how does Accessibility influence  
Competitiveness and Growth**

**Summary  
Report 2013:2**



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# Summary

## **Correlations between accessibility, economic competitiveness, and regional growth potential**

Transport Analysis and the Swedish Agency for Growth Policy Analysis have jointly analysed the ways in which accessibility affects economic competitiveness and regional growth potential from various perspectives. The goal of the governmental commission has been to present proposed ways in which the follow-up of the national transport policy objectives could be enhanced, particularly in terms of higher geographical resolution in the current metrics and indicators.

Transport policy follow-ups in recent years have focussed at the national level on the status, development, and usability of the transport system.<sup>1</sup> The current goal follow-up process needs to be developed in relation to the objective delineated above. Most importantly, the follow-up process is far too national in its focus, which does not favour the efficient distribution of initiatives to the locations where they are most needed in order to strengthen the transport system as a whole, which would require greater knowledge of local and regional conditions. Focusing the goal structure more clearly on accessibility also creates new needs for knowledge and measurement methods regarding various aspects of accessibility and its status in different parts of the country.

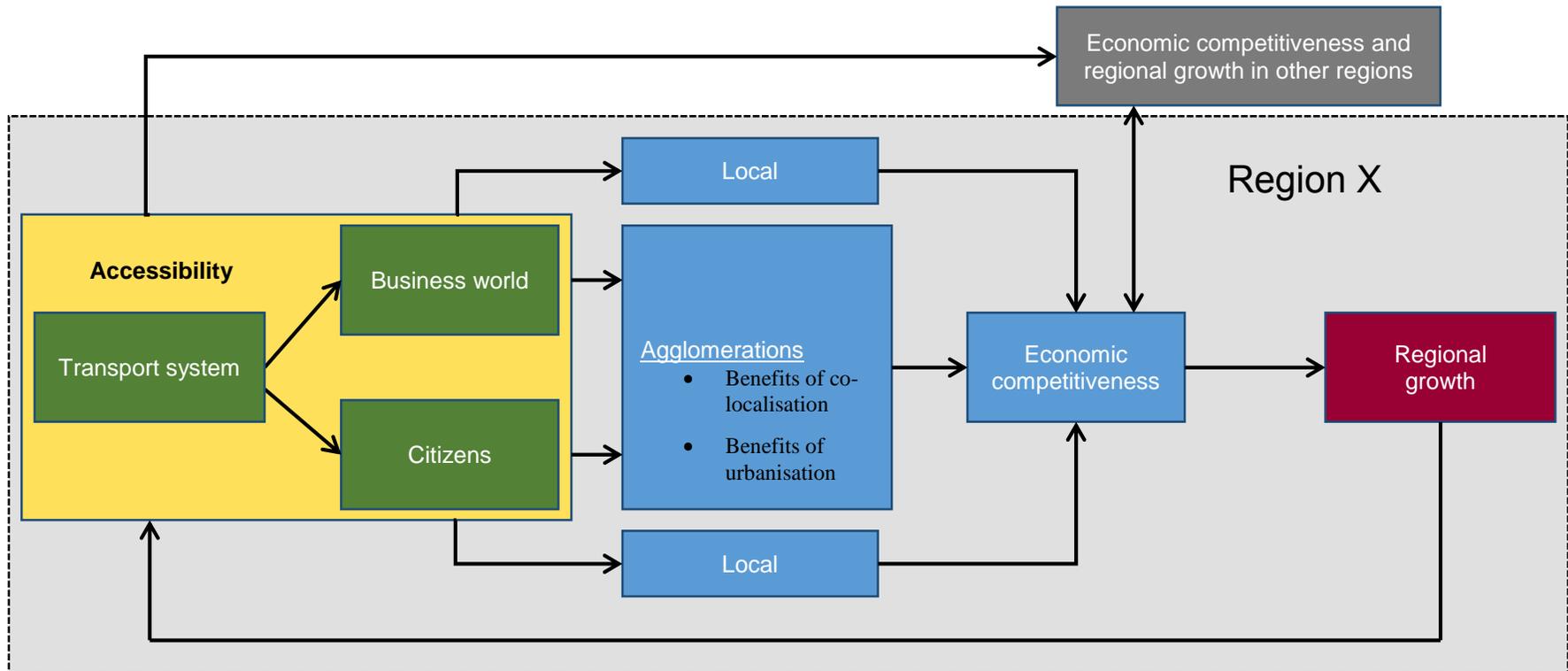
According to the set goals, the transport system must also contribute to growth. In particular, it must contribute to making our economy more competitive internationally, and to regional growth potential. Our knowledge of the correlation between improvements in accessibility, competitiveness, and growth potential is currently limited. This is, however, not specifically a problem in terms of goal follow-up, but rather a general problem that occupies researchers in the fields, for example, of transport and regional economics.<sup>2</sup> In other words, there is untapped potential and a major need for broad knowledge-building in parallel with targeted goal follow-ups using a limited number of metrics and indicators.

This report describes the current state of our knowledge, a number of analyses of how geographical accessibility can contribute to economic competitiveness and regional growth potential from various perspectives, and how the follow-up of transport policy goals can be enhanced by proposing indicators related to the first three specifications of the functional objective.

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<sup>1</sup> Trafikanalys [Transport Analysis] (2012a)

<sup>2</sup> See, e.g., Geurs et al. (2012), Capello and Nijkamp (2009), and Mulley (2012).



**Figure 1.1. A conceptual model of the correlation between accessibility, competitiveness, and regional growth.**

The conceived correlation between accessibility, competitiveness, and growth is presented schematically in **Figure 1.1**. Four more-or-less interactive factors have been assumed to be the underlying driving forces that determine accessibility: *land use*, which reflects the offering, quality, and spatial distribution of various potential travel destinations, *the transport system* and the “cost” associated with moving from one place to another, *time–space restrictions*, and *individual preferences and options*.<sup>3</sup> In other words, it is not only through improvements in the transport system or the physical

<sup>3</sup> Van Wee, R., Chorus, C., and Geurs, K.T. (2012).

infrastructure that changes in accessibility can occur. A change in one or more of these factors will presumably lead to adaptations to the new situation by companies and people.

The business world is heterogeneous, which means that the needs and options that exist in terms of adapting an enterprise or localisation to new conditions will vary. For example, shipments of a specific group of goods are, as a rule, made using a specific transport mode, one that may be completely unaffected by lower transport costs. Consequently, the impact of a change in accessibility in that industry will be nil, or possibly relatively small if we factor in its indirect effects. Transport intensity differs from one industry to another, and this also affects the degree of impact. Some industries are also more focussed on local markets. Even if these companies also need intermediate goods, they are not equally dependent on being able to access more remote markets. This is represented in the conceptual model by the “Local” boxes.

With regard to the citizenry, there are a number of parallels to accessibility for the business world. One such parallel is that there is a need for all modes of transport, as the competitive interfaces differ from one mode to another. From a regional growth perspective, it is vital to increase people’s access to the labour market. The feasibility of getting a new job is determined by a combination of environmental and individual factors. The environmental factors include the general state of the labour market in terms of, for example, unemployment and the number of available jobs. Improved access to the labour market is an important factor contributing to regional growth in that it improves matching in the labour market, helping the labour market function better. The combined effect of a change in the transport system and adaptation by the business world and the citizenry determines the final change in accessibility, as illustrated by the yellow “Accessibility” area in Figure 1.1.

In the model, the way in which the labour market functions serves as a bridge to the “Agglomerations” box. One reason why agglomerations foster growth is that they facilitate matching in the labour market. Co-localisation and urbanisation effects have to do with the fact that both companies and employees can benefit from interacting with numerous companies and employees in other industries.<sup>4</sup> The better these components work, the better the chances for an economy that is highly competitive, which in turn improves the conditions and assumptions for regional growth.

In the model, the growth in a region ultimately results from the competitiveness of its economy relative to the competitiveness and growth of other regions. This is tied to theorisations concerning the *new economic geography* and their analysis of how localisation is affected by various transport costs. In other words, economic competitiveness is determined not only by low transport costs; it is also conceivable that various measures implemented in the transport system could contribute indirectly through improved access to labour, workplaces, and various societal functions. Generally, one might say that an improved transport system that provides higher accessibility facilitates the process, so that knowledge, technology, innovations, business dynamism, entrepreneurship, internationalisation, economies of scale, and an efficient regulatory framework can be enhanced and contribute to economic growth.<sup>5</sup>

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4 Tillväxtanalys [Swedish Agency for Growth Policy Analysis] (2010a).

5 Tillväxtanalys [Swedish Agency for Growth Policy Analysis] (2010b).

Empirically, the argument in favour of the correlation between greater accessibility and increased growth has been difficult to prove. One common simplification is to start by analysing whether there is any correlation between more infrastructure, for example, in terms of kilometres of road or the amounts of money invested in infrastructure expansion, and economic growth. A weak positive correlation does appear to exist. In recent years, the analytical approach has shifted, favouring studies at the regional level with a focus on accessibility aspects such as improved travel times, so that the impact of an investment can be assessed more directly. The results point to a more heterogeneous outcome that is often context dependent. The need thus exists for more analyses to determine what conditions and assumptions are important in terms of confirming that a positive correlation does exist.

We have tackled this challenge in two ways in the framework of the project. First, through several subprojects that have endeavoured to a greater or lesser extent to elucidate or argue for the correlation between accessibility, competitiveness, and growth and, second, by presenting a number of indicators and metrics, with appropriate geographical resolution, that will, if followed up on an ongoing basis, create conditions favourable to expanding our knowledge of the correlation between accessibility and regional growth.

## **Proposed metrics and indicators**

An inventory and analysis of the metrics so far used in the goal follow-up process indicates that they mainly describe the status of the transport system and how it is being used. Most metrics are reported at only a national or functional level (i.e., road and track type). A relevant goal follow-up process requires that deep and broad-based data be compiled, processed, and analysed. This necessitates structure in everything from data gathering to final reporting. This report describes the structure of the metrics and indicators that we believe are needed to follow up the evolution of the transport sector in relation to the first three of the transport policy specifications under the functional objective concerning accessibility.

The three specifications contain aspects that are intended to describe the system itself, how easy it is to use, the accessibility that the system enables for companies and people in terms of reaching their objectives, the systemic deficiencies, and what longer-term effects the development of the transport system will have on competitiveness and growth.

Our starting point in formulating the proposals was to reuse, as much as possible, pre-existing metrics that we considered relevant, while enhancing the degree of elucidation, particularly by increasing the geographical resolution so that it becomes possible not only to make status determinations but also to identify where in the country action initiatives would be warranted. Because of the lack of available data, this aspiration set the bar somewhat higher than we could reach during the term of the project. The Swedish Transport Administration has been unable to provide geographically resolved data material to the extent anticipated, which has considerably limited our options in terms of analysing how these metrics would work in practice.

Our proposal remains that the metrics that describe the transport system itself should, where possible, be based on the road- and track-type parameters used by the Swedish Transport Administration. These can then be broken down by geographic area, with the geographical division based on municipalities grouped as per the Swedish Association of Local Authorities and Regions' (SALAR) municipality group classification system.<sup>6</sup> Such a set-up does not work for all metrics, and the reporting process must be flexible enough to permit other divisions and classifications as well.

New metrics have been created within the project in other areas, particularly with respect to various accessibility metrics based on the performed analyses. For example, two generalised transport-mode accessibility metrics have been created and analysed, which will, in the long run, be able to provide detailed knowledge of accessibility and the need for improvements in different parts of the country, for example, for various groups of passengers and goods. As a complement, transport mode-specific metrics have also been created for the accessibility of service sites, workplaces, and stops. The PiPoS analytical tool of the Swedish Agency for Growth Policy Analysis now makes it possible to describe accessibility in terms of how many people or workplaces can be reached by car within a given period. One new addition is the Accession tool, which is expected to be used in a similar manner in detailed analyses of accessibility with regard to public transport, not just to and from a given stop but also through the public transport system.<sup>7</sup>

The proposed goal follow-up structure is summarised in **Table 1.1**. Three indicators are proposed with regard to travel by the citizenry: *reliability*, *convenience*, and *security*. Metrics and one or more numerical values are associated with each of these. Commercial shipments are followed up using three indicators: *reliability*, *convenience*, and *infrastructure and competitiveness*. The following indicators are proposed for the more distance-based or geographical accessibility aspects: *regional accessibility*, *inter-regional accessibility*, and *international accessibility*. We propose that the metrics initially be reported based on the SALAR groupings. More detailed reporting at, for example, the municipal level, is possible in some cases, but the data quality is considered insufficient to support such detailed follow-up in a number of cases.

Workplace accessibility is important not only for people's employment opportunities but also for companies' ability to find workers with the right competences. The evolution of the transport system, the ability to reach one's workplace within 45 minutes, and the impact of these factors on personal earnings have been studied in a panel data analysis. The results indicate that a correlation does exist, which means that there is reason to monitor a metric, such as the number of accessible workplaces, very closely over time.

To study the ability of the transport system to contribute to international competitiveness more generally, the proposal includes three internationally comparable metrics from the UN, World Bank, and OECD. These metrics provide generalised but more transparent information about the general situation, such as how companies perceive a country's transport system, generally broken down by transport mode – albeit only at the national level.

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<sup>6</sup> In 2005 and 2011, the Swedish Association of Local Authorities and Regions [Sveriges kommuner och landsting] issued a classification of municipalities based on several characteristics; the classification is intended for use in analyses, comparisons, and reporting (see [http://www.skl.se/kommuner\\_och\\_landsting/om\\_kommuner/kommungruppsindelning](http://www.skl.se/kommuner_och_landsting/om_kommuner/kommungruppsindelning)).

<sup>7</sup> Accessibility calculations using the Accession tool are expected to be available as of the 2014 goal follow-up process.

Corresponding information with resolution at the regional level can be obtained to some extent, for example, from the Confederation of Swedish Enterprise's index at the municipal level.

A generalised transport-mode approach is represented by the *inter-regional accessibility* indicator. Here we propose a metric that consists of generalised transport costs for transporting people and shipping goods. To achieve robustness in the follow-up process and also make it transparent, the comparisons of generalised transport costs should focus on a larger aggregate of groups of goods (or passengers with regard to the transport of people), for example, low/medium/high-value goods from one year to the next. The trade pattern can also be updated based on the rate at which new base years are formulated by the Swedish Transport Administration, i.e., roughly every four years, and more extensive analyses can then be performed.

Many of these proposed indicators will be applied in the 2013 follow-up of transport policy goals. However, ongoing development work is still needed in some areas, such as calculations of generalised transport costs, calculations of accessibility *through* the public transport system, and indicators of regional status and growth.

**Table 1.1. Structure of metrics and indicators for the goal follow-up process.**

Specification	Indicator	Metric
Travel by citizens	Reliability	Delays and cancelled departures in public transport
		Congestion in the road and railroad system
		Complementarity
	Convenience	Quality of the road system
		Quality of the railroad system
		Passengers' perceptions of quality
	Security	Objective security
		Subjective security
	Commercial shipments	Reliability
Congestion in the road and railroad system		
Shippers' perceptions of reliability and security from an international perspective		
Convenience		Shipping customers' perceptions of convenience from an international perspective
		Enterprises' perceptions of convenience
Infrastructure and competitiveness		Transport infrastructure, competitiveness, and growth
Geographic accessibility	Regional accessibility	Accessibility of services
		Accessibility of public transport
		Accessibility of the labour market
		Generalised local transport-mode accessibility
	Inter-regional accessibility	Accessibility of destinations
		Inter-regional accessibility
		Generalised accessibility
		Accessibility of ports/logistics centres
	International accessibility	Accessibility of work and services from a Nordic perspective
		Availability and accessibility internationally (by air)







Transport Analysis is a Swedish agency for transport policy analysis. We analyse and evaluate proposed and implemented measures within the sphere of transport policy. We are also responsible for official statistics in the transport and communication sectors. Transport Analysis was established in April 2010 with its head office in Stockholm and a branch office in Östersund.