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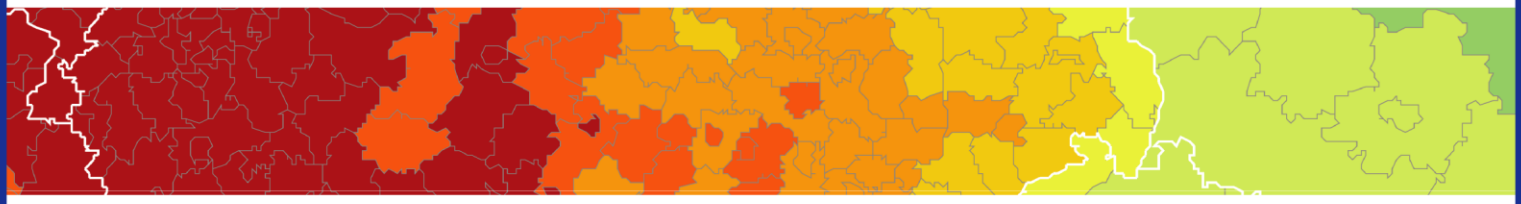

Potentials of big data for integrated territorial policy development in the European growth corridors (Big Data & EGC)

Targeted Analysis

Executive Summary

28/06/2019

This Targeted analysis activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

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This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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The final version of the report will be published as soon as approved.

Need for a broader understanding of functional growth corridors

The potentials of big data for corridor-based development are evident and widely discussed, yet there is a need to develop specific approaches to utilising big data to inform growth corridor policy. As a setting, growth corridors are influenced by multiple levels of governance involving many kinds of flows and interactions. These overlapping and interlinked flows and interactions cannot be fully captured by using traditional data sources. Big data and new data sources could be used to produce new insights and evolve a more comprehensive understanding of corridors. Such a broader understanding of flows and interactions is needed to support comprehensive corridor governance.

The aim of the Big Data & EGC Targeted Analysis was to strengthen the knowledge-base for evidence-based planning in European growth corridors that build on the TEN-T transport infrastructure network. This analysis covered the so-called Northern Growth Zone (NGZ) that stretches from Oslo -- via Örebro, Stockholm, Turku and Helsinki -- to St. Petersburg, following the northern parts of Scandinavian-Mediterranean (ScanMed) TEN-T corridor.

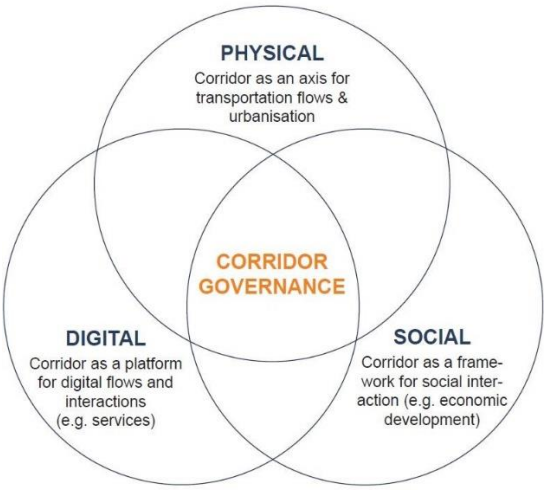
By examining potentials for big data to support corridor-related policy-making in the research area covering Finland, Sweden and Estonia, the project answered to the needs of project stakeholders of the Regional Council of Southwest Finland, Region Örebro in Sweden, and the Estonian Ministry of Economic Affairs and Communications. According to these stakeholders, the key policy contexts related to corridor development that would benefit from big data are: 1) infrastructure and connectivity planning; 2) regional economic development, and; 3) land-use planning. Using new datasets in policy-making could fill the gaps in the evidence-base and connect policy silos. Understanding the motivations and drivers of, e.g., physical mobility highlights the significance of more comprehensive examination of spatial connectivities.

This analysis sought to generate new knowledge about how big data can be used to expose functionalities of the NGZ. A goal of the analysis was to demonstrate and test new methods for producing insights from unusual datasets across three case studies and a hackathon. This analysis contributes to larger efforts to develop new ways for supporting policy-making with timely and detailed evidence.

A framework for comprehensive corridor governance

Gaining a more comprehensive view of corridor flows and interactions can be achieved by exploring an issue from multiple angles. To this end, a conceptual model was produced in the targeted analysis to help policymakers consider what kinds of data could be used to support corridor governance based on evidence (Figure 1). The framework describes three overlapping functional dimensions of corridor development:

Figure 1: Conceptual framework for broadening the perspective of corridor functionalities.

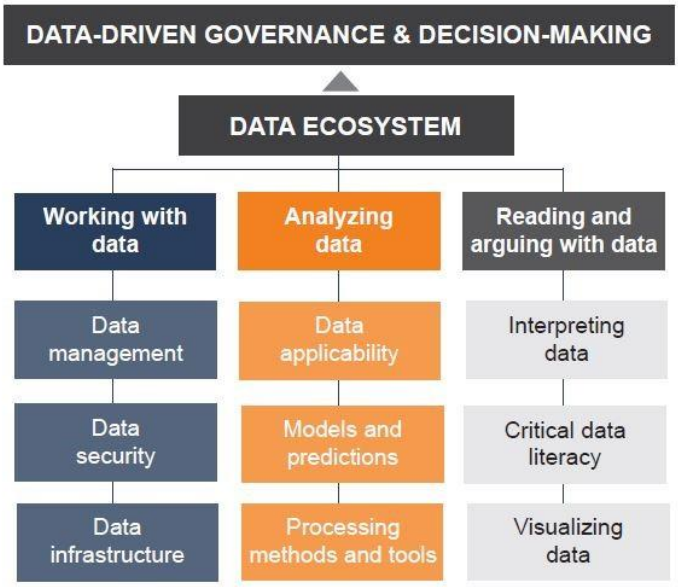


1) the **physical** dimension emphasizing transportation flows and urbanisation;
2) the **digital** dimension realizing digital flows and interactions as an active part of corridor functions;
3) and, the **social** dimension viewing the corridor as a framework for social interaction.

From data management to data-driven governance

In order to drive the use of big data in governance and decision-making across a corridor, it is important to aim capacity building practices at many levels – from the organisations to corridor wide networks. Developing a data ecosystem for data-driven corridor governance requires building different data literacy capacity areas (Figure 1).

Figure 1. Recommendations for capacity building.



Overall, a healthy data ecosystem requires a mental shift from data management to data-driven governance. When organisational cultures become highly competent in using big data and aware of how data-derived insights are produced, they will be able to broaden the evidence-

base of territorial development. Alongside this capacity building, it is highly important to incorporate ethical guidelines and best practices. An organisation's ability to use big data for evidence-based policy-making in corridors cannot rely on only a few technically skilled employees. While having data science teams with high competence is important, all employees and stakeholders of an organisation need awareness of how to use big data so any big data insights produced by any other actor can be appropriately scrutinised and understood before actions are taken based upon it. Experts who are capable of transforming data into appropriable data and action are helpful to all levels of an organisation.

The conceptual framework was applied to produce a categorisation (Table 1) of key flows and interactions which are highly relevant to corridor governance and policymaking. The categorization, includes examples of what kinds of datasets are available concerning each kind of flow and interaction. The main purpose of this categorisation is to serve as a starting point for considering what kinds of existing or new data to include when designing data-driven inquiries to support corridor-wide policymaking.

Table 1. Categorization of example data sources for corridor development (shortened version).

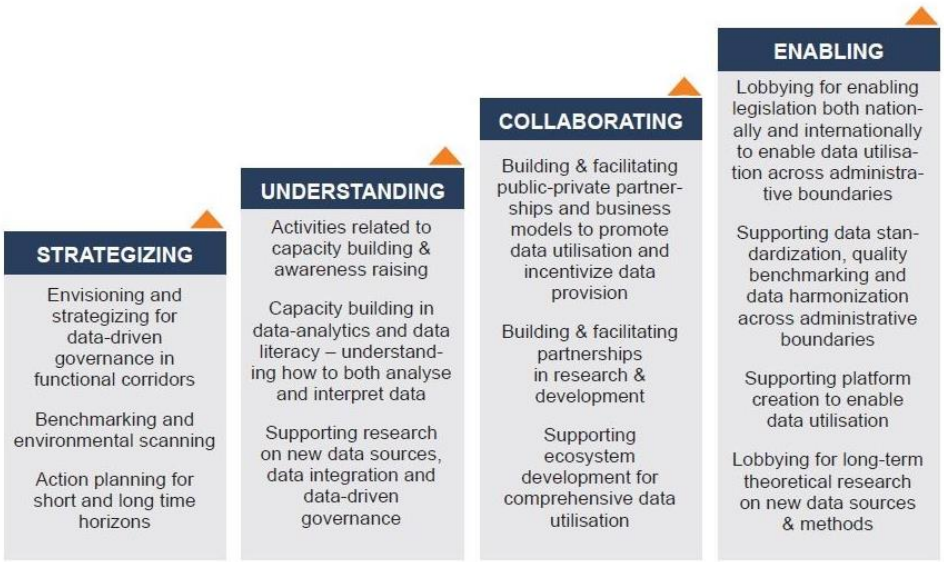
Dimension	**Interactions/Flows**	**Example data sources**
Physical	Cargo Flows	Traffic management systems, maritime shipping manifests, air cargo manifests, waste and recycling metrics
	Customer Flows	Retailer bonus programs, price scanner data, space-based imaging of retail parking lots
	Daily Commuting	Vehicle-produced data, mobile positioning data, private GPS services, electricity consumption by building and unit
	Student Mobility	Student train/bus ticket sales, university student registers, exchange programs
	Tourism & Leisure Flows	device languages on wireless networks, social media photos, geotagged tweets, mobile positioning data
	Business Travel Flows	EU border crossing statistics, tradeshow 'booth lists', customer data from booking agencies
Social	Research Cooperation	funded research projects, research consortiums, bibliograp. datasets, e.g. co-authors, open science portals, patent data
	Trade Interaction	Trade statistics, B2B transactions, industry conference lists, tradeshow listings of registered booths, speakers, attendees
	Inter-Firm Cooperation	Supply chains, business consortiums, shared patents
	Family/Social Interactions	Mobile positioning data, social graphs (e.g. Facebook Social Graph, LinkedIn network connections, Twitter followers)
	Student Interactions	Course lists, Student union member lists, exchange student lists; joint degree programs, student groups on social media
	Planning Cooperation	Minutes of official planning meetings, verbatim transcripts of public meetings, vendor bids
	Purchase flows	B2B invoices, price scanner data, import/export metrics, personal finance/fintech apps
Digital	Network traffic flows	IP Pairing Site Network Traffic (IPX), Wireless Data Traffic; Internet Service Provider networks traffic; Satellite signals
	Monetary flows	IPO trading, corporate bonds, public bonds, business loans, consumer loans
	Communication flows	Phone utility metadata, mobile positioning data (e.g. caller-called pairs), user interactions with social media posts

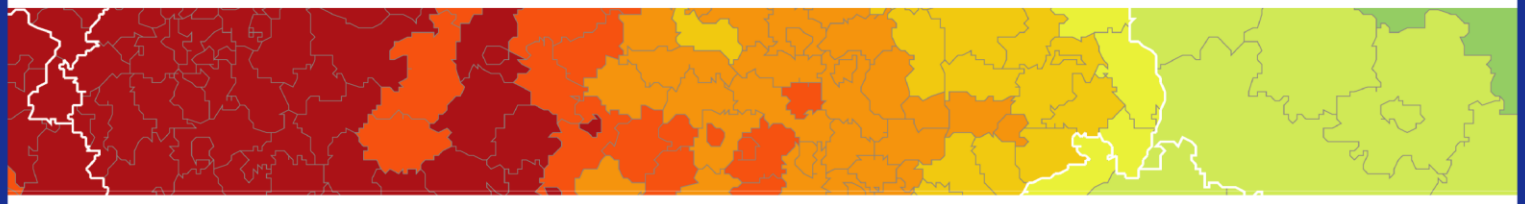
Summary of policy recommendations

Based on the review of the broader big data landscape and the execution of case studies exploring the potentials related to three different datasets, the final report of this targeted analysis presents a summary of policy implications as well as recommendations for big data-driven corridor development. Figure 2 presents a summary of recommended measures that can be promoted through corridor collaboration and territorial development. The first measure is to strategize for data-driven territorial governance, as well as to create action plans for how to develop comprehensive data utilisation. The second step is to build capacity to improve administrators' capacity to recognize potentials in new data sources and generate actionable insights from them. In addition, public organisations should develop their skills in data analytics. The third measure is to establish and foster collaboration and partnerships. Partnerships can include public-private partnerships to incentivise data provision, as well as partnerships in research and development — e.g., between research organisations and companies. The fourth step is to enable big data utilisation by harmonising and standardising data management systems, diminishing legislative restrictions on wider data utilisation, as well as lobbying for long-term theoretical research on new data sources and methods.

The measures are further elaborated upon in the practical guide of this targeted analysis and address collective and individual actions needed to promote big data utilisation. Producing new evidence to support policy-making using big data is a collective effort that needs to be supported by the EU and national level authorities. At the end, however, the utilisation potential is also relative to the intended use: public-private partnerships with companies offering flow analytics services may provide rapid support for policy-making, whereas harmonisation of statistical systems at the EU level supports integrated territorial development over the long run. Short and long-term objectives are not necessarily mutually exclusive, but there is often a trade-off between resourcing short-term and long-term gains that needs to be considered.

Figure 2: Steps towards data-driven corridor governance.





ESPON 2020 – More information

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