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Energy & Environment

## Beyond Mobility - Understanding and comparing urban accessibility in European Cities

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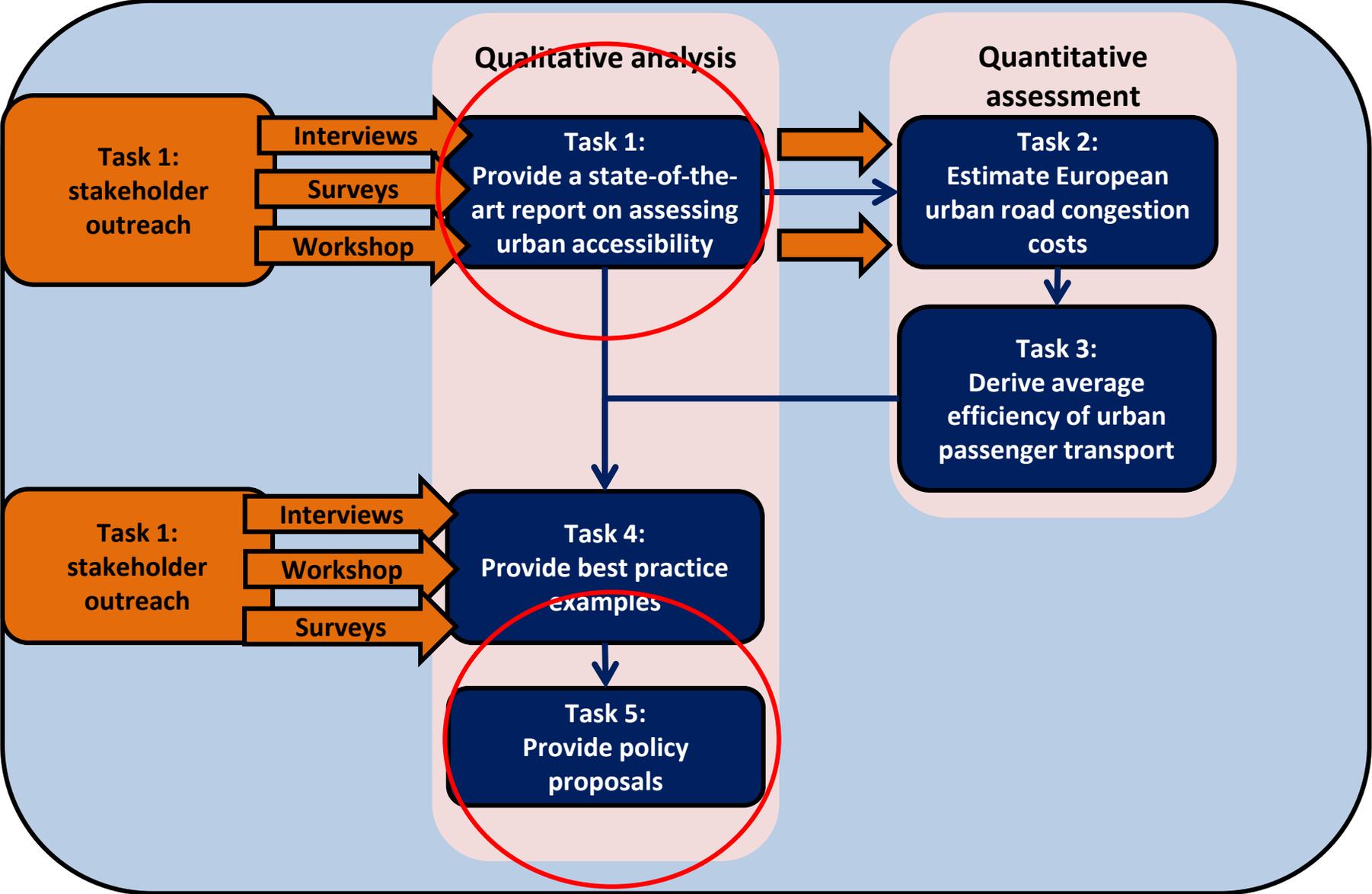


## Study on improving the understanding of urban accessibility and road congestion in Europe

- Client: DG MOVE
- 2 year study – completed and due to be published soon

*“The general objective of this EU study is to improve understanding of urban accessibility and road congestion, and support a debate on understanding and improving urban accessibility in order to improve the functioning of urban areas and make the transport system more “resource efficient”*”

# Study on improving the understanding of urban accessibility and road congestion in Europe



'The average opportunity which the residents of the area possess to take part in a particular activity or set of activities' (Wachs & Kumaga, 1973)

'The extent to which the land use-transport system enables (groups of) individuals or goods to reach activities or destinations by means of a (combination of) transport mode(s)' (Geurs & van Eck, 2001)

'the ease in meeting one's needs in locations distributed over space for a subject located in a given area' (Cascetta, Carteni, & Montanino, 2013)

Property of individuals' surroundings (e.g. the transport-land use system) or particular places: "[Accessibility is] the extent to which the land use-transport system enables (groups of) individuals or goods to reach activities or destinations by means of a (combination of) transport mode(s)." (Geurs & van Eck, 2001)

'The opportunity which an individual or type of person at a given location possesses to take part in a particular activity or set of activities' (Hansen, 1959)

'The consumer surplus, or net benefit, that people achieve from using the transport and land use system' (Leonardi, 1978)

## Defining 'Accessibility'

'The number and diversity of places that can be reached within a given travel time and/or cost' (Bertolini, Le Clercq, & Kapoen, 2005)

As property of an individual: "Accessibility is a measure of the ease of an individual to pursue an activity of a desired type, at a desired location, by a desired mode, and at a desired time" (Bhat, et al., 2000)

- Accessibility differs from mobility:

## Mobility

*Movement of people and goods*



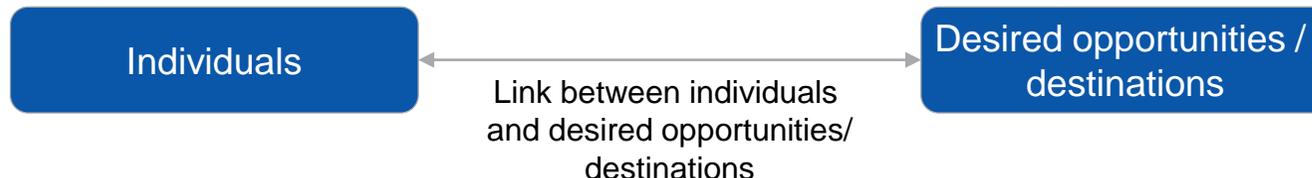
## Accessibility

*Consideration of opportunities enabled by mobility*



- A working definition of accessibility is:

*“....the **ease of reaching** goods, services, activities and destinations in urban areas. It includes factors such as mobility options, travel information, transport network connectivity, land use patterns and cost for both passengers and freight.”*



## Land use

*Where activities are*



## Transport

*How to get to activities*



### Accessibility Dimensions



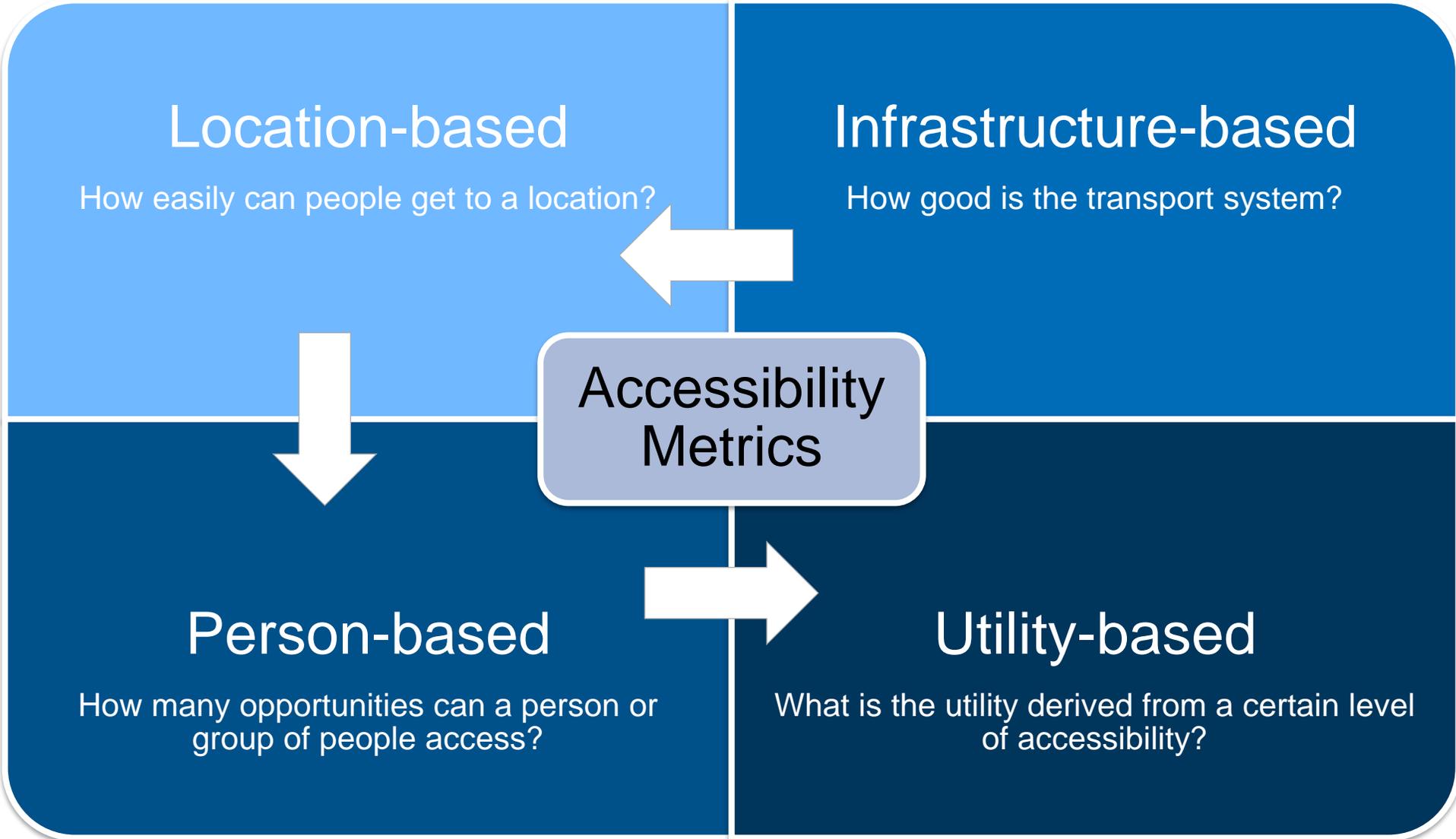
## Individual

*Needs, capabilities and perceptions*



## Temporal

*When are opportunities available and what time to people have to access them*



# Coverage of dimensions of accessibility by type of accessibility measure

		Component			
		Transport component	Land-use component	Temporal component	Individual component
<b>Measure</b>	<b>Infrastructure-based measures</b>	<i>Travelling speed; vehicle-hours lost in congestion</i>		<i>Peak-hour period; 24-h period</i>	
	<b>Location-based measures</b>	<i>Travel time and or costs between locations of activities</i>	<i>Amount and spatial distribution of the demand for and/or supply of opportunities</i>	<i>Travel time and costs may differ, e.g. between hours of the day, between days of the week, or seasons</i>	<i>Only personal location</i>
	<b>Person-based measures</b>	<i>Travel time between locations of activities</i>	<i>Amount and spatial distribution of supplied opportunities</i>	<i>Temporal constraints for activities and time available for activities</i>	<i>Accessibility is analysed at individual level</i>
	<b>Utility-based measures</b>	<i>Travel costs between locations of activities</i>	<i>Amount and spatial distribution of supplied opportunities</i>	<i>Travel time and costs may differ, e.g. between hours of the day, between days of the week, or seasons</i>	<i>Utility is derived at the individual or homogeneous population group level</i>

## Location-based

- ✓ Reasonable easy to collect data
  - ✓ Easy to understand
- ✗ Limited details of personal dimension

## Infrastructure-based

- ✓ Simple to measure
- ✓ Easy to collect data
  - ✗ Ignores land use
- ✗ Limited personal dimension

## Accessibility Metrics

## Person-based

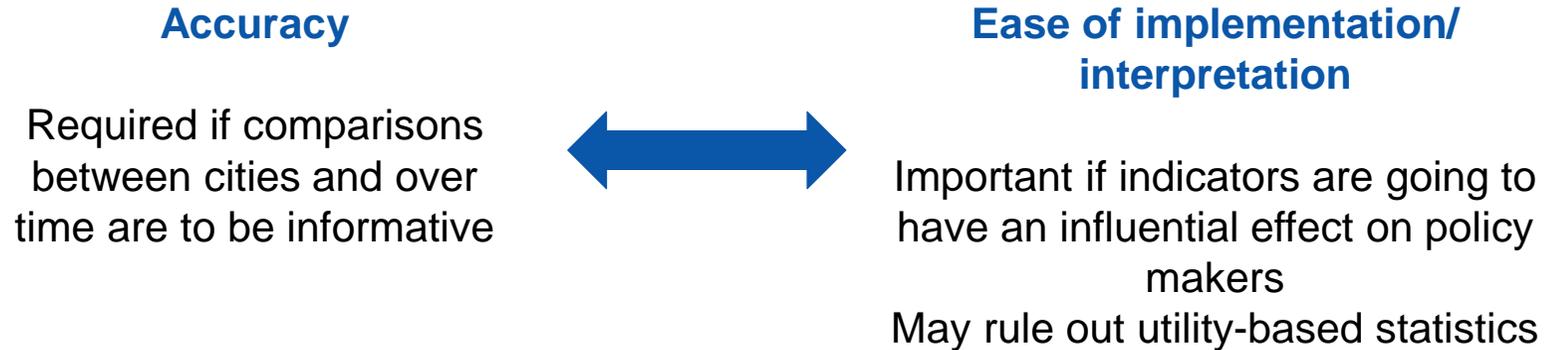
- ✓ Accounts for personal dimension
- ✗ Requires lots of local data collection

## Utility-based

- ✓ Accounts for all aspects
- ✗ Complex to calculate difficult to understand

# Accessibility indicators for comparing European Cities

- Trade-off between accuracy and ease of implementation/interpretation



## European-level accessibility indicators

- Location-based most likely candidate
- Simple travel distances/times to opportunities
- Supported by use of types of indicators in comparative accessibility studies
- EPSON TRACC, UK Department for Transport Accessibility Statistics.

# Barriers to improving accessibility

Lack of:

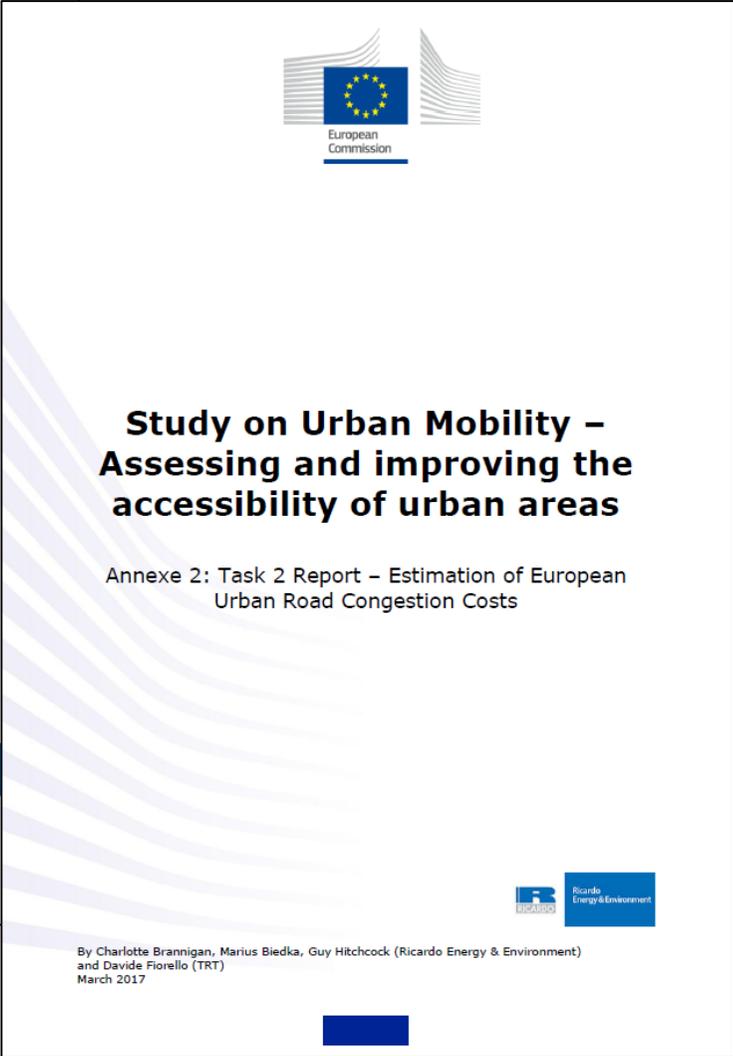
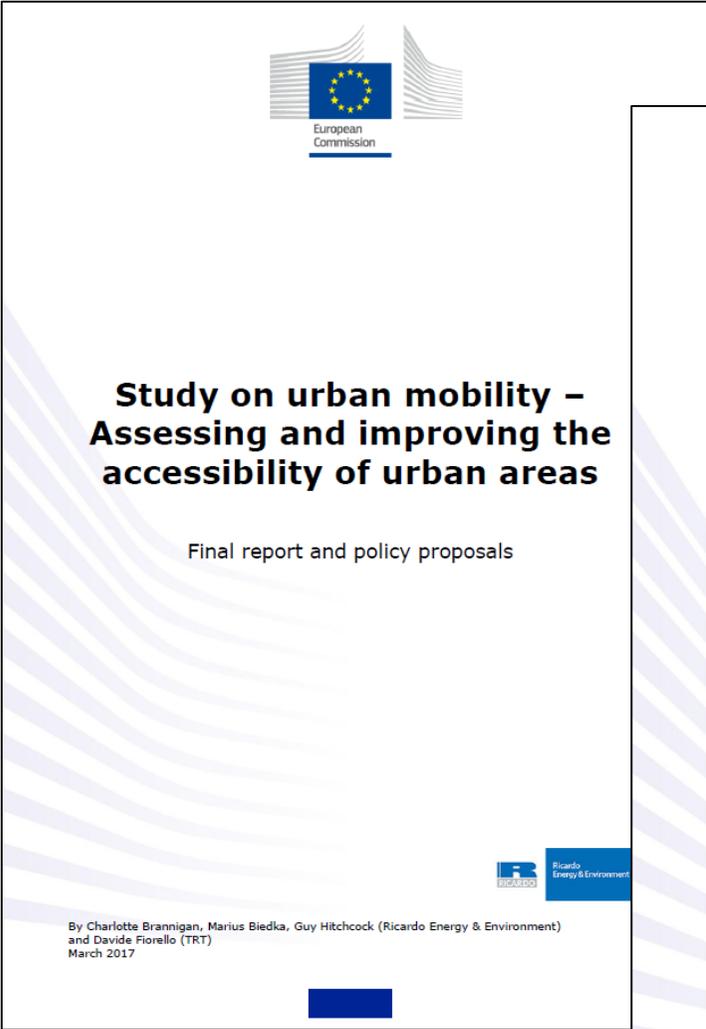
1. Common definition of accessibility
2. Comparable and consistent monitoring data
3. Understanding of measures to improve accessibility
4. Interpreting accessibility as a main goal
5. Understanding of congestion costs
6. Financial resources
7. Consideration of accessibility in other policy areas

Recommendations / policy actions	Common definition of accessibility	Comparable / consistent data	Understanding of accessibility measures	Interpreting accessibility as main goal of policies	Understanding – congestion costs and links to accessibility	Consideration accessibility in wider policy	Financial resources	
Provide a common understanding and definition of accessibility and its relationships with congestion	✓		✓		✓			€
Develop a set of comparable indicators		✓						€€
Promote consistent and comparable data collection to compute indicators		✓						€€
Include accessibility improvements as an explicit goal in policy assessment within urban transport policy but also outside transport policy highlighting how accessibility can be promoted by non-transport policy				✓		✓		€
Support knowledge sharing and best practice between EU cities building on existing urban mobility programmes			✓					€€
Contribute to provide cities with the financial resources to implement policies to improve accessibility							✓	€€€

- Accessibility is very complex
  - There are a wide range of definitions
  - It is more than just mobility as it considers the opportunities enabled by mobility
  - It has four key dimensions: Spatial, Temporal, Personal, Temporal
  - There are a wide range of metrics
- Improving accessibility in cities as we are looking to generate greater benefits for citizens
- To support improving accessibility
  - A greater focus on accessibility rather than just mobility
  - Providing a common definition of accessibility that can be used by all cities
  - Defining a common measurement metric and support related data collection
  - Sharing best practice between cities
- Build support for accessibility into the existing SUMP processes and support systems



Final report available at:  
[http://ec.europa.eu/transport/themes/urban/studies\\_en](http://ec.europa.eu/transport/themes/urban/studies_en)





**Thank you for your attention**

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