BENCHMARKING ACCESSIBILITY TO SERVICES ACROSS CITIES

Workshop on “Improving planning and appraisal through the use of accessibility indices”
30-31st October, Paris
Different but complementary approaches

**Bottom-up**: case by case – high detail but harder to expand to large number of cities

**Top-down**: directly on a larger number of cities – more limited on detail but better suited for global frameworks

ITF has been developing a top-down approach tool for global benchmarking of accessibility in cities since 2016

Development of global frameworks are particularly relevant with “affordable and equitable access for all” as SDG and NUA goals
Measuring access to opportunities

- % of population within 1 000 metres from a public transport stop
- % of population within a 30-minute public transport trip
New ITF framework for benchmarking accessibility to services across cities

Database: all urban areas in Europe by Dec 2018

Visualisation tool

Analysis for subset of cities in the context of sustainability and inclusiveness goals

From discussions

Test different ideas for ranking cities

Test graphs and features of visualisation

Get impressions on possible application
Design accessibility metrics that:

- Focuses on access to opportunities
- Are comparable at a global level
- Are simple but scalable
- Are multimodal
**Methodological choices**

**Contour-based metrics**
- City limit
- 30 minutes isochrone

**Large coverage**
- EU Cities > half a million inhab.
- 4 modes of transport
- 9 services
- 3 time thresholds

**Global databases and formats**
- Ex: OpenStreetMaps

**Comparable approaches**
- Same methodology
- Comparable perimeters (FUA)
- No behavioural parameters
# Methodological choices

<table>
<thead>
<tr>
<th>Type</th>
<th>Services included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Services</td>
<td>Bank, Post Office, Pharmacy</td>
</tr>
<tr>
<td>Consumption</td>
<td>Department Store, Market, Shopping Centre, Shop</td>
</tr>
<tr>
<td>Education</td>
<td>All types of schools</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>Fire Station</td>
</tr>
<tr>
<td>Health</td>
<td>Doctor, Dentist, Health Care Service</td>
</tr>
<tr>
<td>Hospital</td>
<td>Hospital/Polyclinic</td>
</tr>
<tr>
<td>Recreational</td>
<td>Museum, Theater, cinema, zoo, stadium, important tourist attraction</td>
</tr>
<tr>
<td>Restaurants</td>
<td>Restaurants, bar, nightclub</td>
</tr>
<tr>
<td>University</td>
<td>Post high-school education facilities</td>
</tr>
</tbody>
</table>

*Source: TomTom provided by EC/JRC (except universities, SCOPUS)*
How do we compute it?

The contour-based indicator is computed:
- For each city on a 1km by 1km grid
- For each service
- For each mode

It is then aggregated at the city level using an average:
- One value per service, mode and threshold for each city
Assumptions and data to compute travel times by car:

1. From actual speed observations (INRIX)
2. At peak-hour
3. Assume 10 minutes extra for access and parking time

Assumptions and data to compute travel times by public transport:

1. Door to door
2. Based on schedules (not real time) produced by local authorities or pt operators
3. Take in account access, waiting and transfer times
Obviously it is rather BIG DATA analysis...

- 115 Functionnal Urban Areas > 500 000 inhab.
- Over 1 million grids, 100 million OD pairs to compute, 28 million road links

... which comes with challenges:

- Data quality (common sense is not enough !)
- Result analysis is not straightforward
What can it be used for?

Comparing cities [in the following only 9 cities to illustrate / temporary results]

Two different perspectives:

1) **how many services can you access (in absolute value or in % of the total services offered by the city) in a given amount of time?**

2) **how many people can access a minimum basket of services?**

More detailed analysis on a limited number of cities

In a city is income and accessibility correlated? Does this vary between cities?

Other examples: compare mode performances in providing access, Variation of access within the city...
How many services can an inhabitant access in 30 minutes by car?

<table>
<thead>
<tr>
<th>City</th>
<th>Services type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paris</td>
<td>emergency, health, recreation, education, consumption, basic services</td>
</tr>
<tr>
<td>Madrid</td>
<td></td>
</tr>
<tr>
<td>Rome</td>
<td></td>
</tr>
<tr>
<td>Lyon</td>
<td></td>
</tr>
<tr>
<td>Vienna</td>
<td></td>
</tr>
<tr>
<td>Lisbon</td>
<td></td>
</tr>
<tr>
<td>Berlin</td>
<td></td>
</tr>
<tr>
<td>Bilbao</td>
<td></td>
</tr>
<tr>
<td>Manchester</td>
<td></td>
</tr>
</tbody>
</table>
How many services can an inhabitant access in 30 minutes by public transport?

Services type:
- emergency
- health
- restaurants
- recreation
- hospital
- university
- education
- consumption
- basic services

Max. services in sample:
- Paris
- Rome
- Bilbao
- Lisbon
- Lyon
- Vienna
- Madrid
- Berlin
- Manchester

Values:
- 2
- 8
- 20
- 59
- 370
- 14
- 1885
- 92
- 1409
- 202
What % of the services offered by his city can an inhabitant access in 30 minutes by car?

<table>
<thead>
<tr>
<th>City</th>
<th>Bilbao</th>
<th>Lyon</th>
<th>Manchester</th>
<th>Vienna</th>
<th>Lisbon</th>
<th>Madrid</th>
</tr>
</thead>
</table>

Services type:
- emergency
- restaurants
- education
- health
- recreation
- hospital
- university
- consumption
- basic services
What % of the inhabitants can access X services within walking distance?

Services type
Minimum in parenthesis

- emergency (1)
- restaurants (10)
- education (3)
- health (5)
- recreation (3)
- consumption (10)
- hospital (1)
- university (1)
- basic services (3)
**Income and accessibility**

**French cities**

**Income class:**
1- lower third
2- middle third
3- upper third
New ITF framework for benchmarking accessibility to services across cities

Database: all urban areas in Europe by Dec 2018

Visualisation tool

Analysis for subset of cities in the context of sustainability and inclusiveness goals

From discussions

Test different ideas for ranking cities

Test graphs and features of visualisation

Get impressions on possible applications
Thank you

Aimée Aguilar Jaber
Nicolas Wagner
Dimitrios Papaioannou