

A Comparison of Accessibilities Between the City of Berlin and Mexico City

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Knowledge for Tomorrow



Changing Urbanisation Challenges and New Mobility Needs



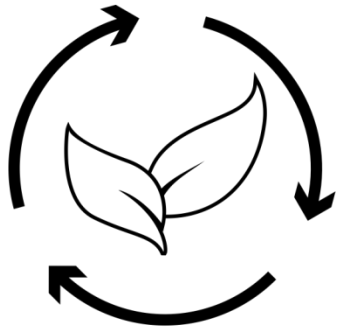
Source: Jorge Narezo Balzaretti Photographic Archive 2018



Accessibility



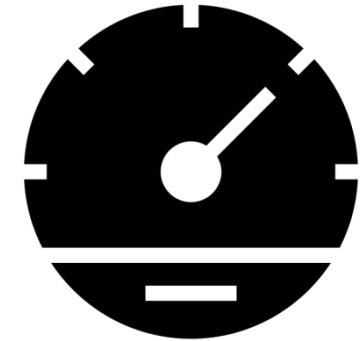
Key topic for current urban development



Directly linked with sustainability and life-quality



Indicates how many given destinations can be accessed within certain limits



Understood as a performance indicator



Distinguishes different types of measures

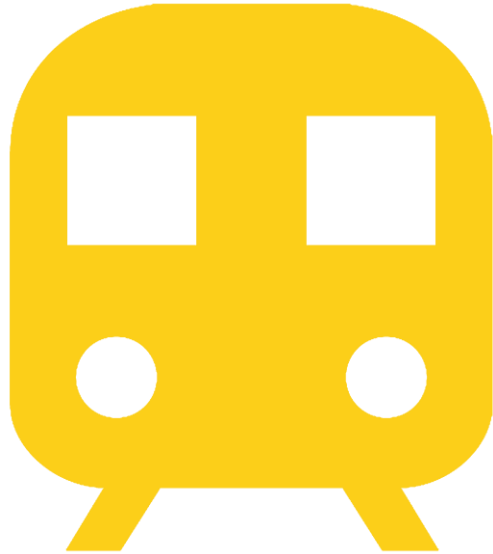


Relevant for Transport Planning and Land-use allocation

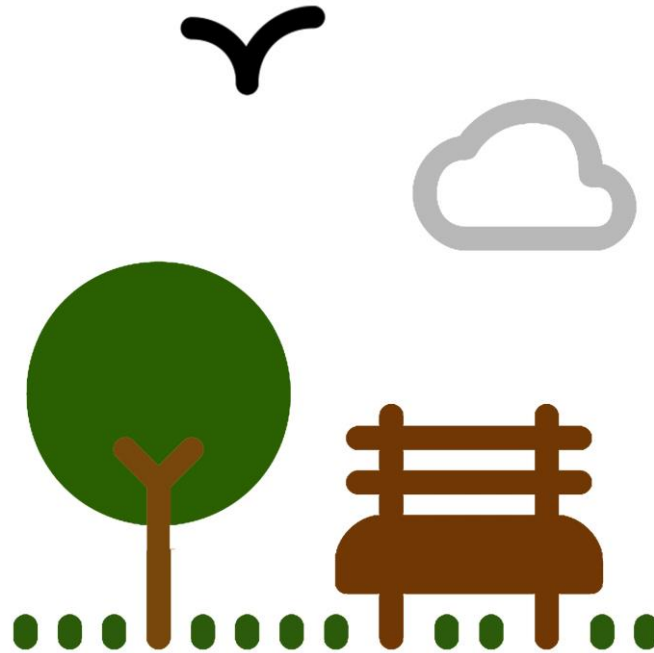


UN-Habitat Sustainable Development Goals

Access to:



Public Transport



Urban Spaces & Parks



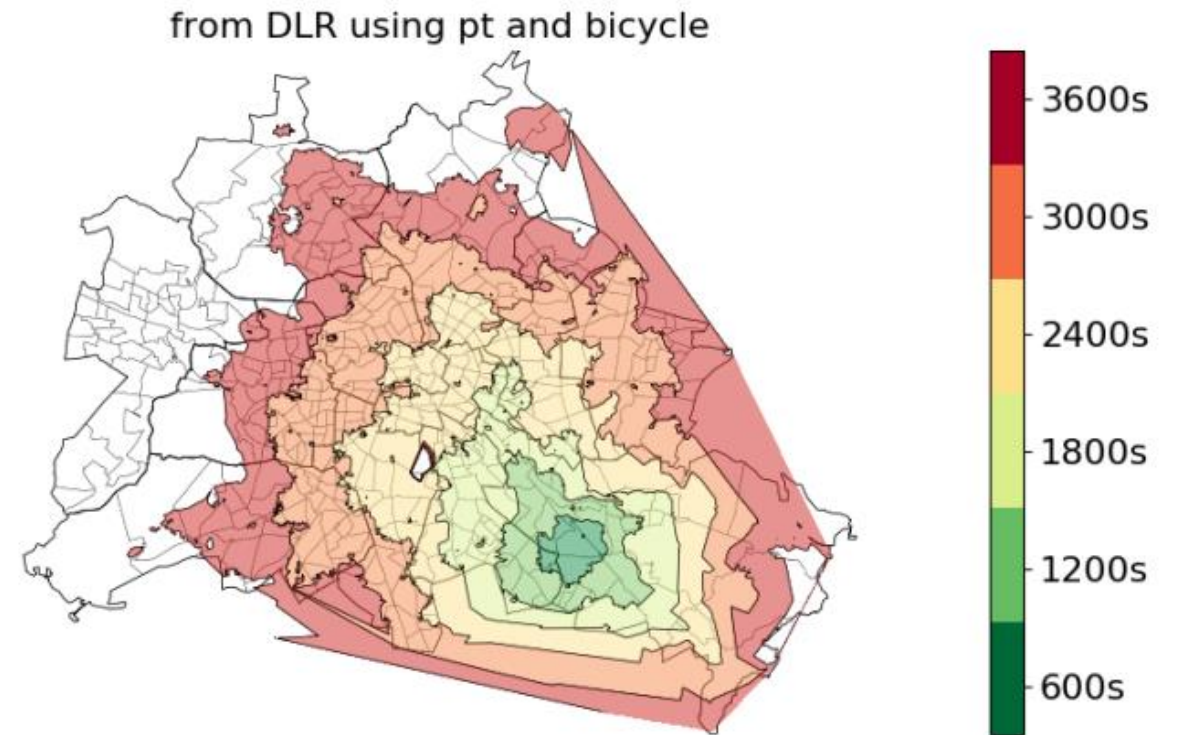
Schools



UN-Habitat Sustainable Development Goals and Accessibility Measures

1. Spatial Separation measures
2. Contour measures
3. Gravity measures
4. Competition measures
5. Time-Space measures
6. Utility measures
7. Network measures

Figure 1: Number of work places accessible from the DLR site in Berlin, Adlershof.



Source: Urban Mobility Project, DLR 2017



Cities and Data

Berlin



Source: Jorge Narezo Balzaretti Photographic Archive 2016

Population: 3.7 Million.
Spatial Extension: 891 km²

Mexico City



Source: Drone Sky Films México 2016

Population: 8.8 Million.
Spatial Extension: 1485 km²



Cities and Data – Transport Systems

Berlin



Subway 10 lines



Tram 22 lines



Inter-urban railway 15 lines



Bus 151 lines

Mexico City



Subway 12 lines



BRT 6 lines



Private operated
1500 routes



Cities and Data – Input Data



Figure 2: Regarded Areas in Berlin.

Source: Urban Mobility Project, DLR 2017



Figure 3: Regarded Areas in Mexico City.

Source: Urban Mobility Project, DLR 2017



Accessibility Computation - UrMo Accessibility Computer

- A tool designed to compute contour measures
- Reads input data from a database
- Supports the modes walking, public transport, cycling and private motorised transport.
- Offers high levels of flexibility to the user to do calculations
- Allows diverse departure times and dates

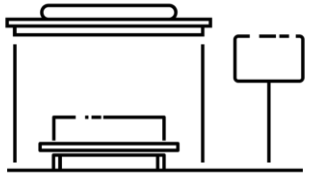
Figure 4: Attaching sources/sinks to the road network



Source: Urban Mobility Project, DLR 2016



Destinations and Transport Modes



Public Transport Stations



Parks



Schools

By



Walking



Cycling



Public Transport

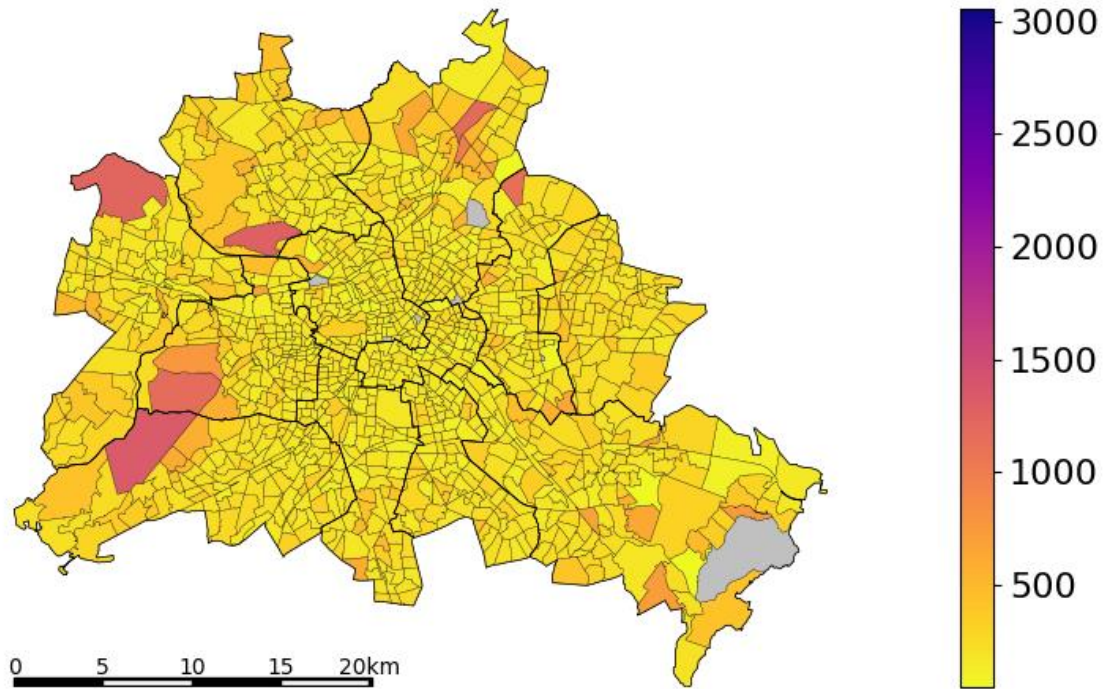


Private Motorised



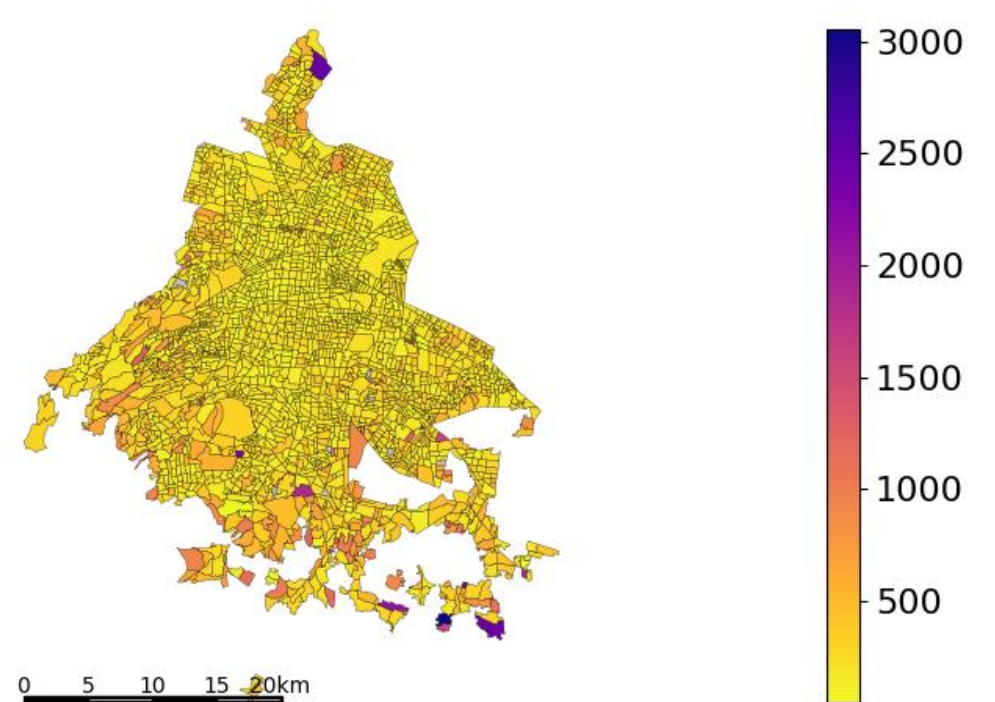
Results – Accessibility to Public Transport

Figure 4: Average travel time to the nearest public transport stop in seconds, by foot, in Berlin.



Source: Urban Mobility Project, DLR 2017

Figure 5: Average travel time to the nearest public transport stop in seconds, by foot, in Mexico City.

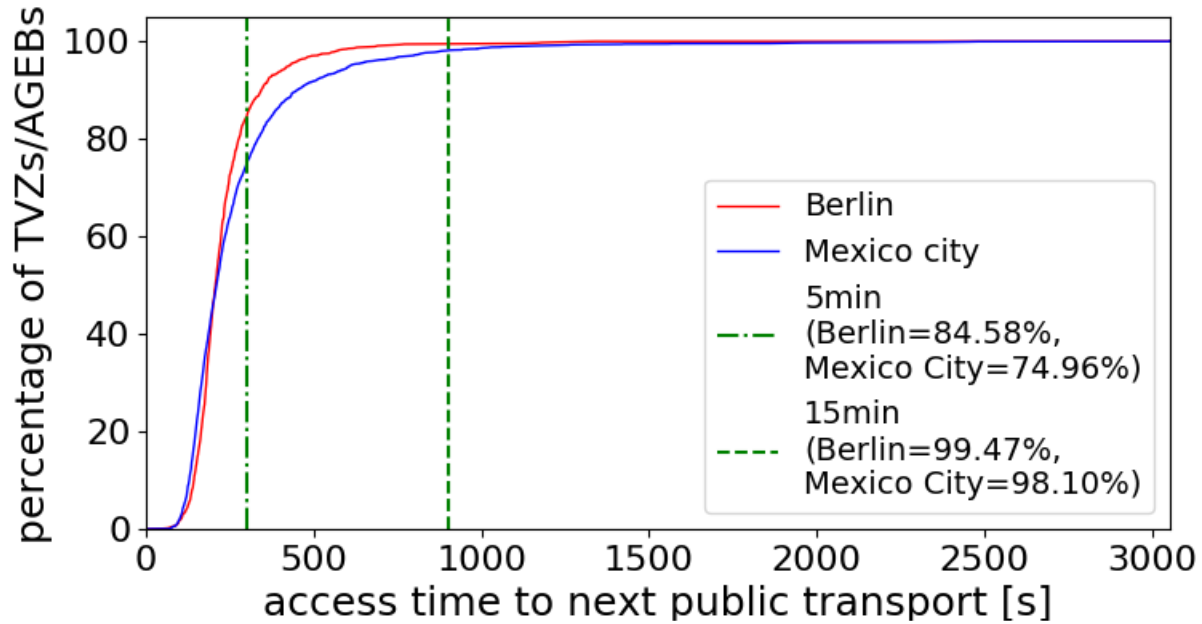


Source: Urban Mobility Project, DLR 2017



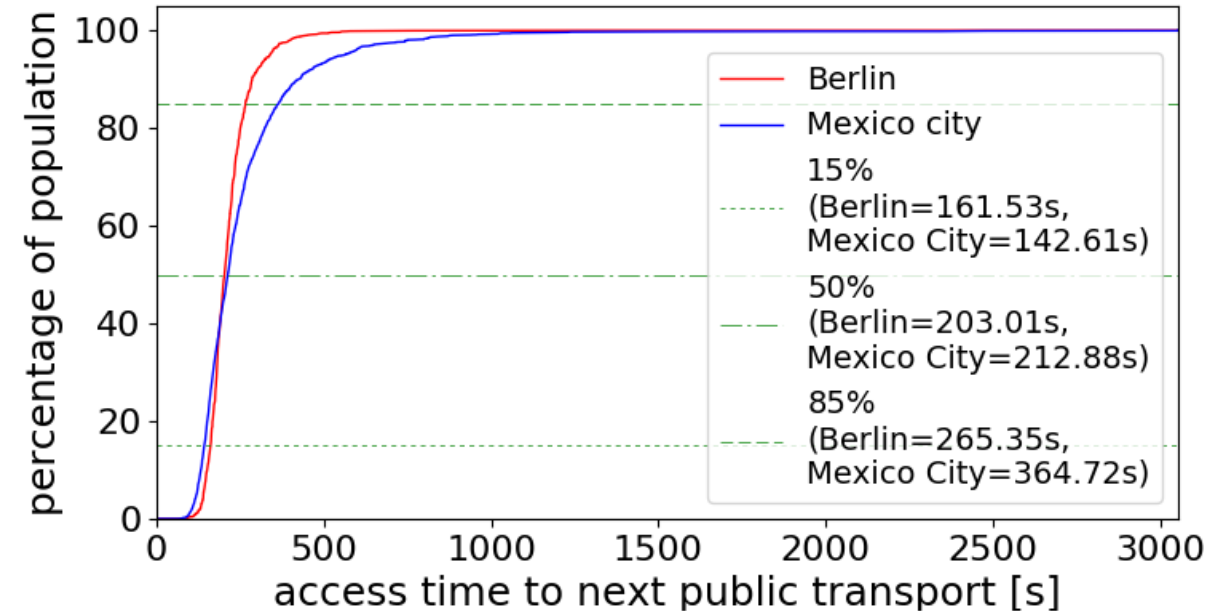
Results – Accessibility to Public Transport

Figure 6: Distribution of the average travel time to the nearest public transport station in seconds, by foot.



Source: Urban Mobility Project, DLR 2017

Figure 7: Distribution of the average travel time to the nearest public transport station in seconds, by foot.

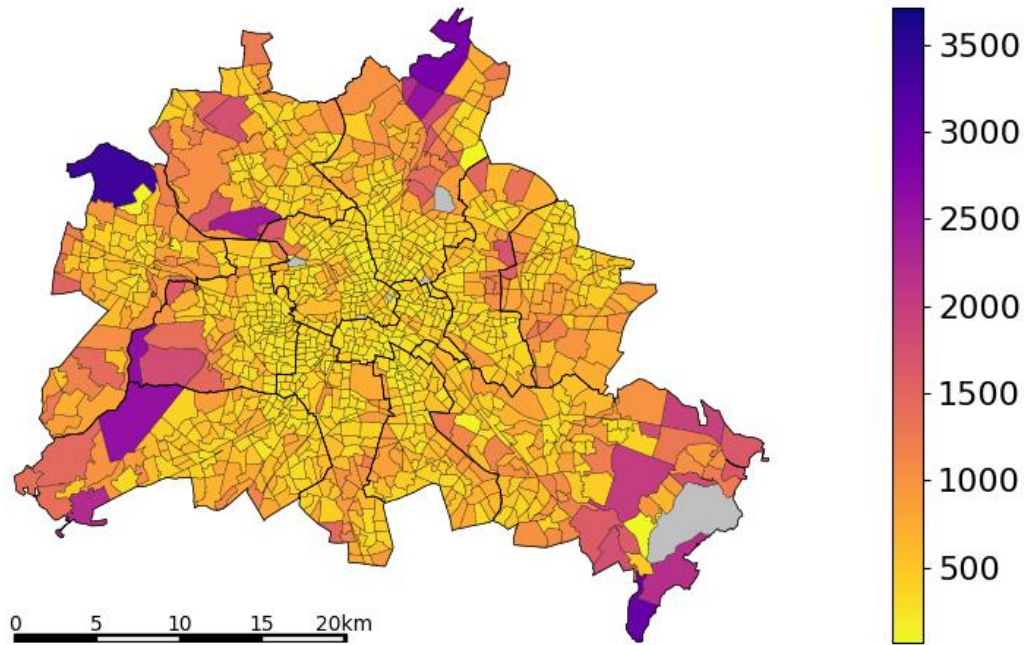


Source: Urban Mobility Project, DLR 2017



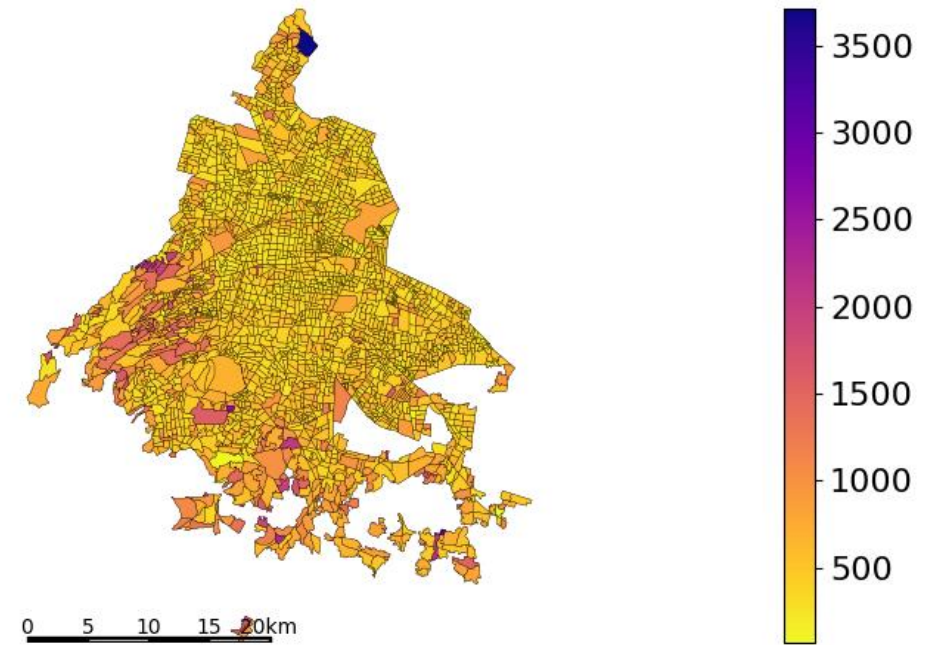
Results – Accessibility to Schools

Figure 8: Average travel time to the nearest three schools in seconds, by foot, in Berlin.



Source: Urban Mobility Project, DLR 2017

Figure 9: Average travel time to the nearest three schools in seconds, by foot, in Mexico City.



Source: Urban Mobility Project, DLR 2017



Results – Accessibility to Schools

Table 1. Accessibility Values to the Three Nearest Schools Grouped by Percentage of Affected Population

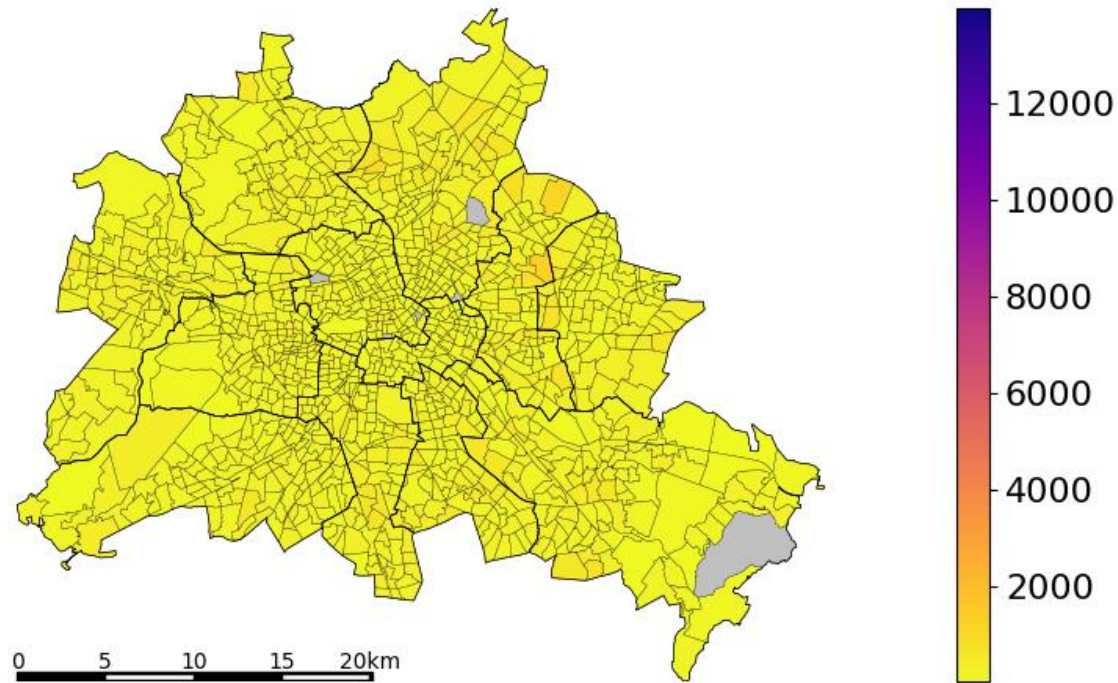
Transport mode	Mexico City			Berlin		
	<i>15%</i>	<i>50%</i>	<i>85%</i>	<i>15%</i>	<i>50%</i>	<i>85%</i>
Walking	318.56s	447.50s	668.44s	271.29s	378.93s	619.91s
Cycling	141.99s	197.32s	287.15s	127.92s	180.36s	284.77s
MIT	90.25s	118.52s	165.20s	112.14s	156.58s	238.08s
PT	339.27s	491.25s	1005.44s	272.87s	377.47s	593.15s

Source: Urban Mobility Project, DLR 2017



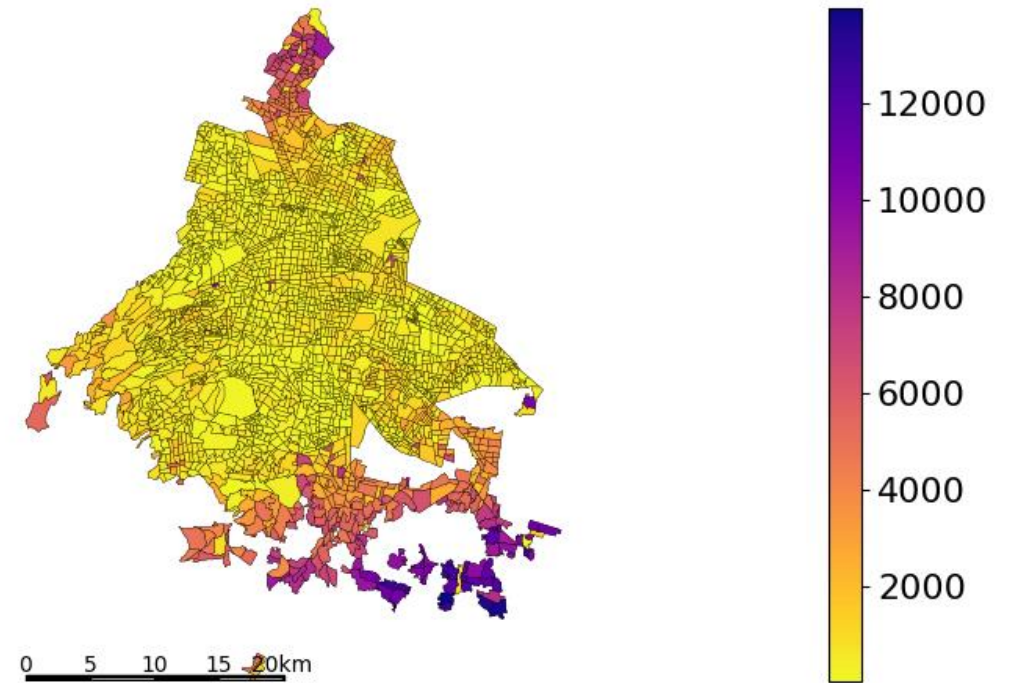
Results – Accessibility to Parks

Figure 10: Average travel time to the nearest park in seconds, by foot, in Berlin.



Source: Urban Mobility Project, DLR 2017

Figure 11: Average travel time to the nearest park in seconds, by foot, in Mexico City.

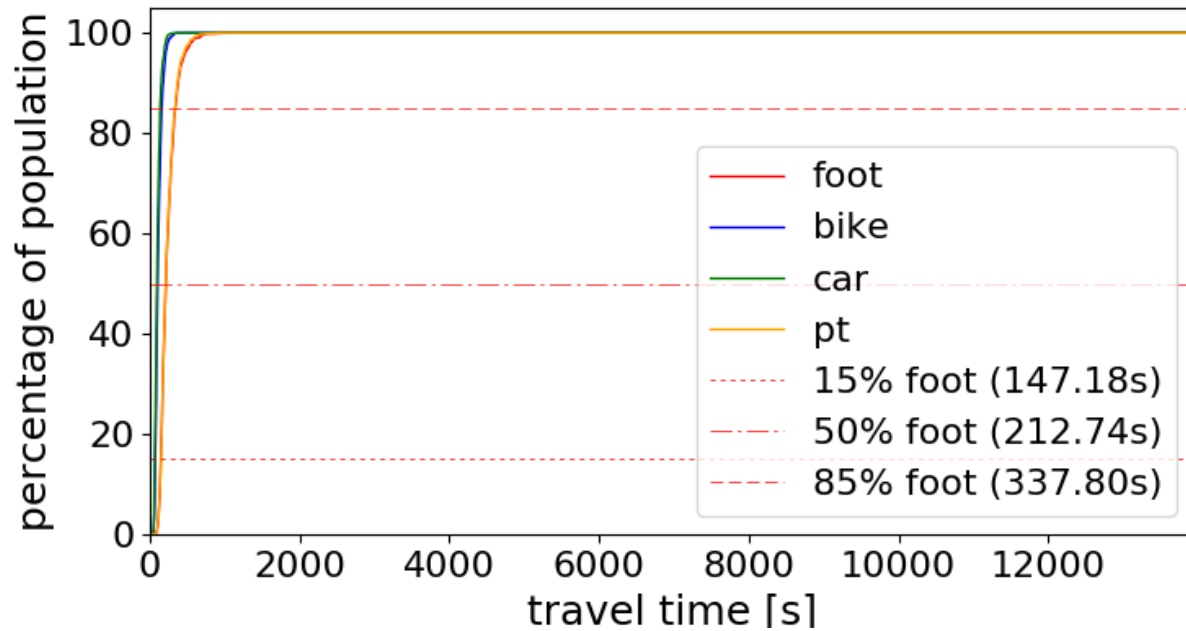


Source: Urban Mobility Project, DLR 2017



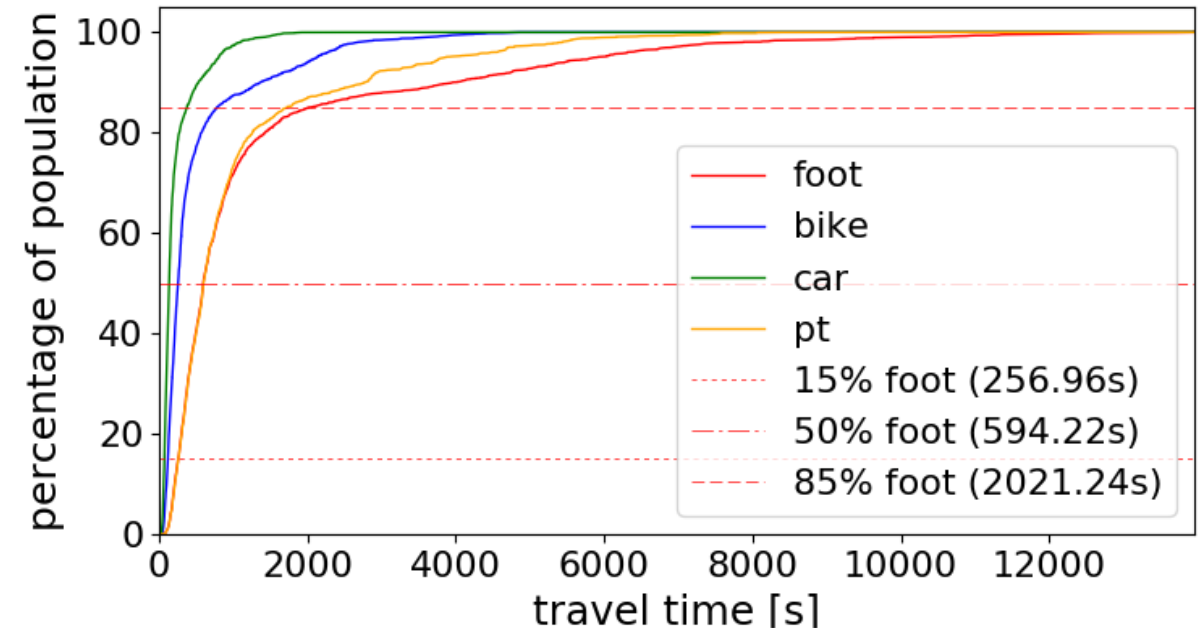
Results – Accessibility to Parks

Figure 12: Distribution of the average travel time to the nearest park in seconds in Berlin.



Source: Urban Mobility Project, DLR 2017

Figure 13: Distribution of the average travel time to the nearest park in seconds in Mexico City.

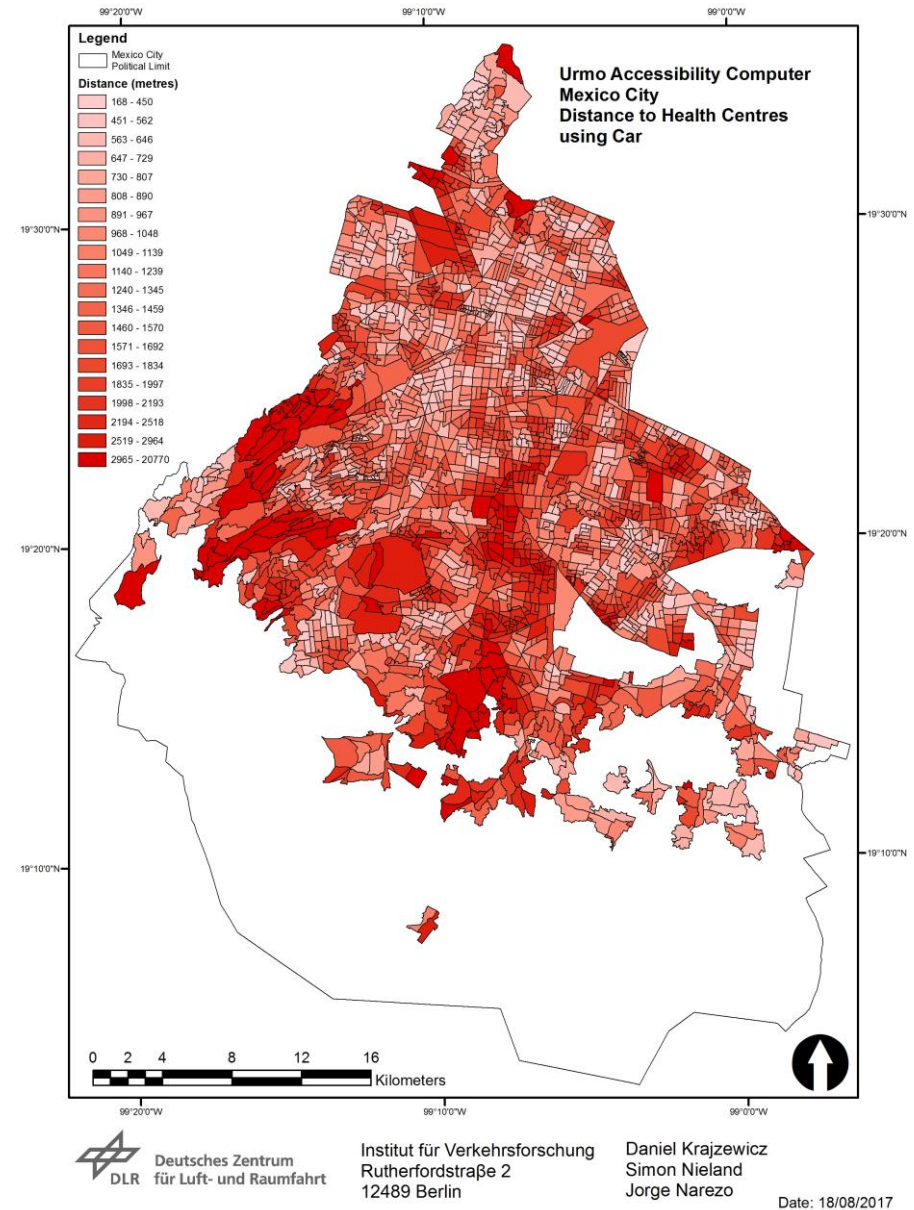


Source: Urban Mobility Project, DLR 2017



Discussion

- Accessibility measures as indicators to assess the **quality** of infrastructure and **performance** of public transport systems.
- **Highly disaggregated** information.
- **Quantitative** and **objective** data.
- Possibility to **compare** different urban areas.
- Procedure that takes into account the **supply** of **facilities** and **population**.



Source: Urban Mobility Project, DLR 2017

Conclusion

- The proposed indicators can be a valuable basis for assessment of Sustainable Development Goals.
- Proper disaggregation is needed for benchmarking accessibility in different regions.
- The methodology can be employed for determining accessibility of different social groups and to compare transport modes.
- Valuable data is obtained to make improvements in mobility and supply of facilities in urban areas.



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