Road and passenger rail transport performance in Europe's territories

Introducing a new accessibility framework

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A new accessibility framework

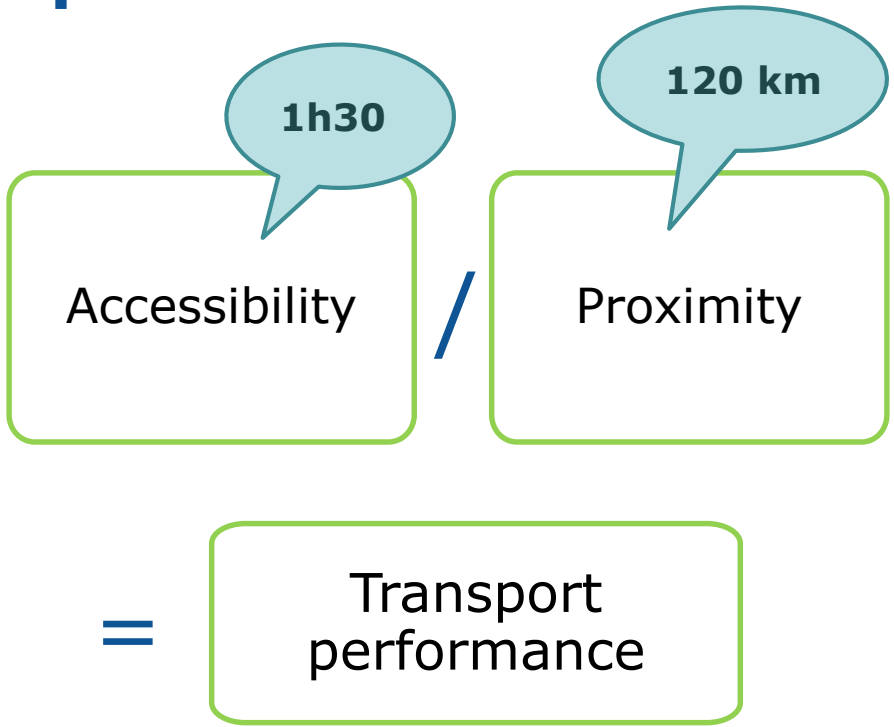
- Based on a simple question:
  - Can I reach all the nearby destinations within a certain time with transport mode Y?
- Can be used for any transport mode, any distance and time, any destination and in any country
- Takes into account spatial distribution of population
- Also applied with ITF and OECD to short trips in EU cities

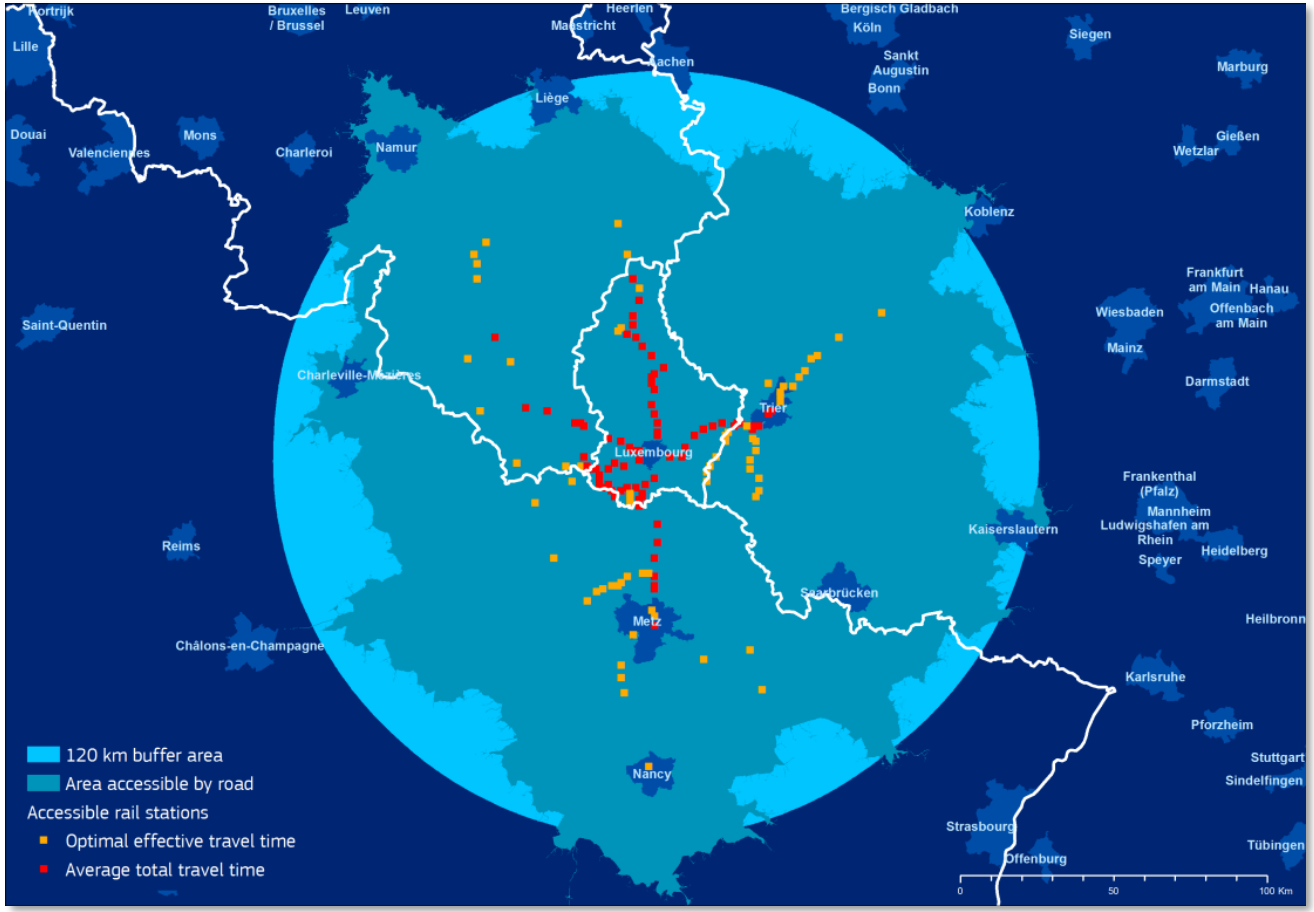
Three simple indicators per mode

1. Accessibility
   Number of destinations that can be accessed in x minutes

2. Proximity
   Number of destinations within y km (as the crow flies)

3. Transport performance
   Ratio between accessibility and proximity (between accessible and nearby destinations)





- Units of analysis: **1 km² grid cells** with population figures
- Complete road network
- Comprehensive rail timetables and station locations

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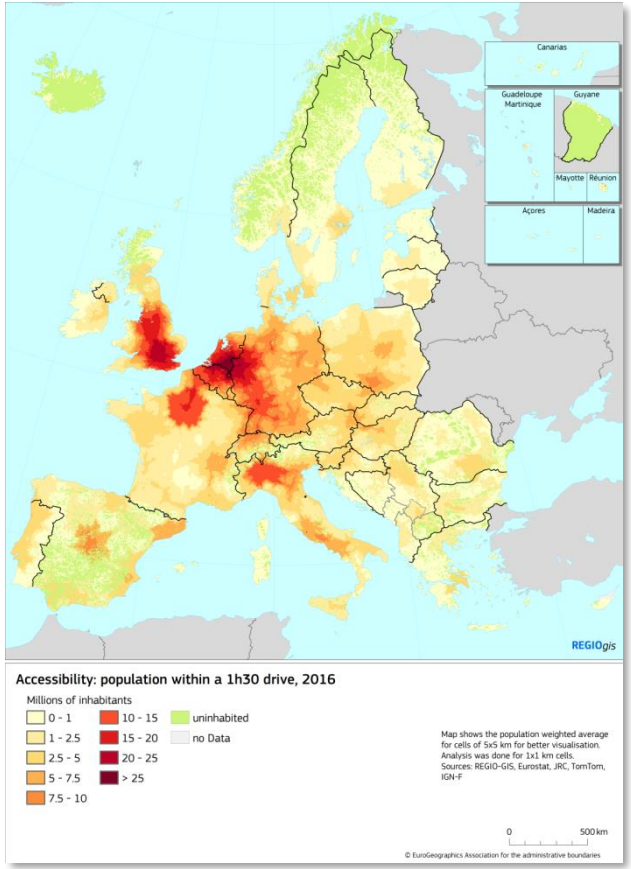
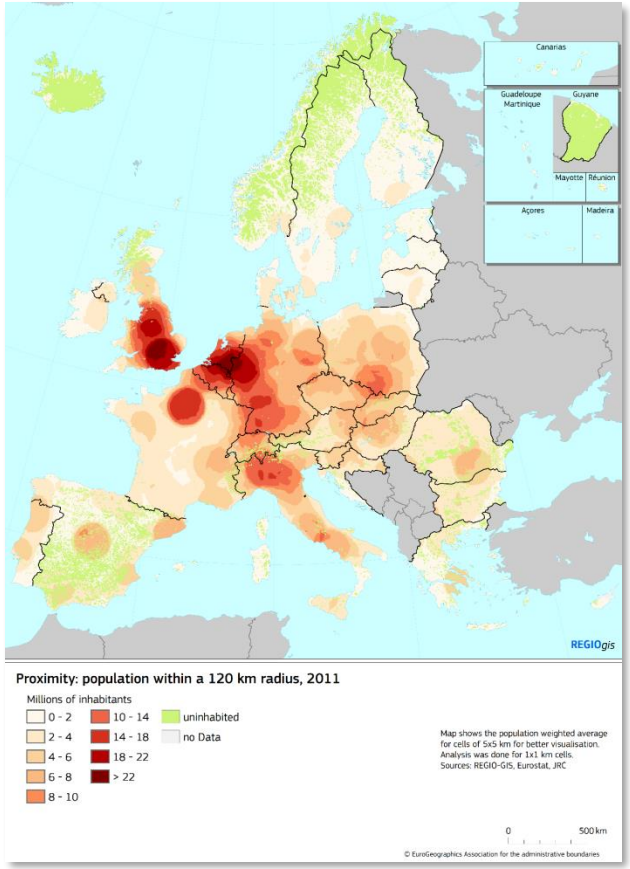
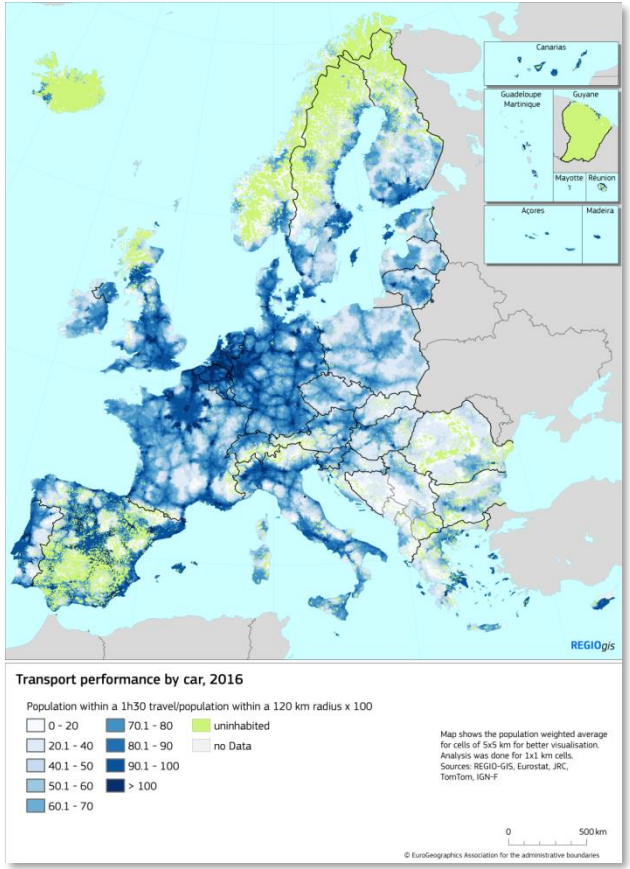




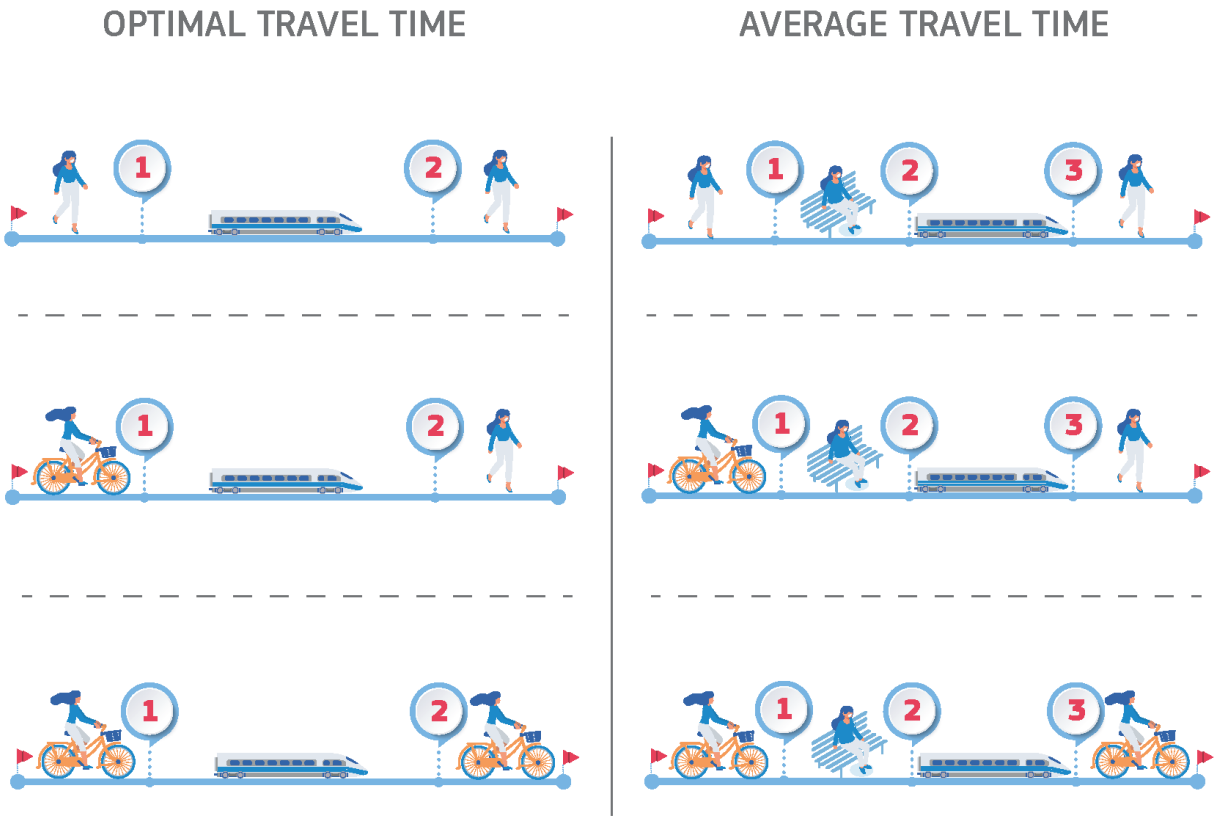


Accessibility by car

Proximity

Road transport performance

Passenger rail: 6 scenarios



- With or without initial waiting time before boarding
- Rail combined with walking and/or cycling

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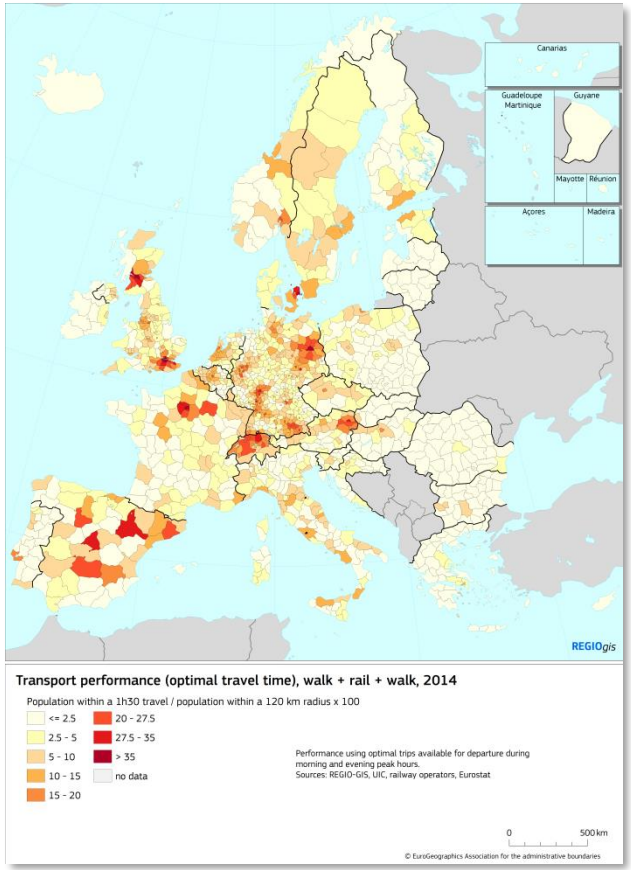
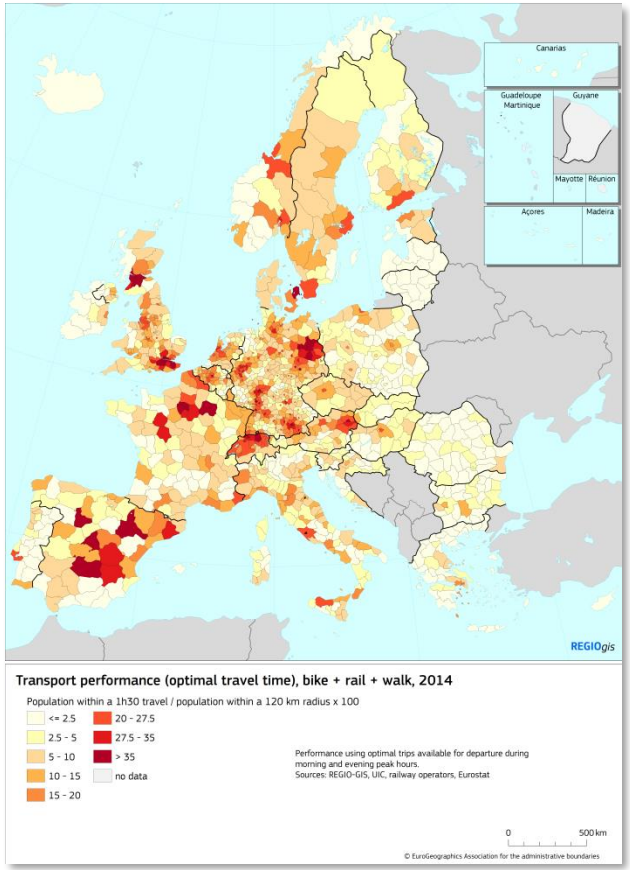
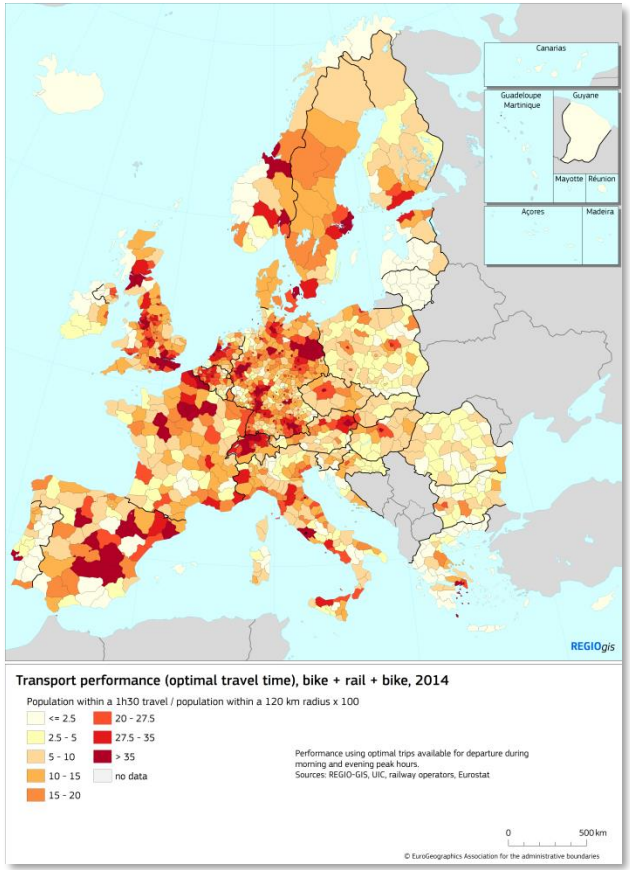
Transport performance (optimal travel time = best available connection without initial waiting)



Walk + rail + walk

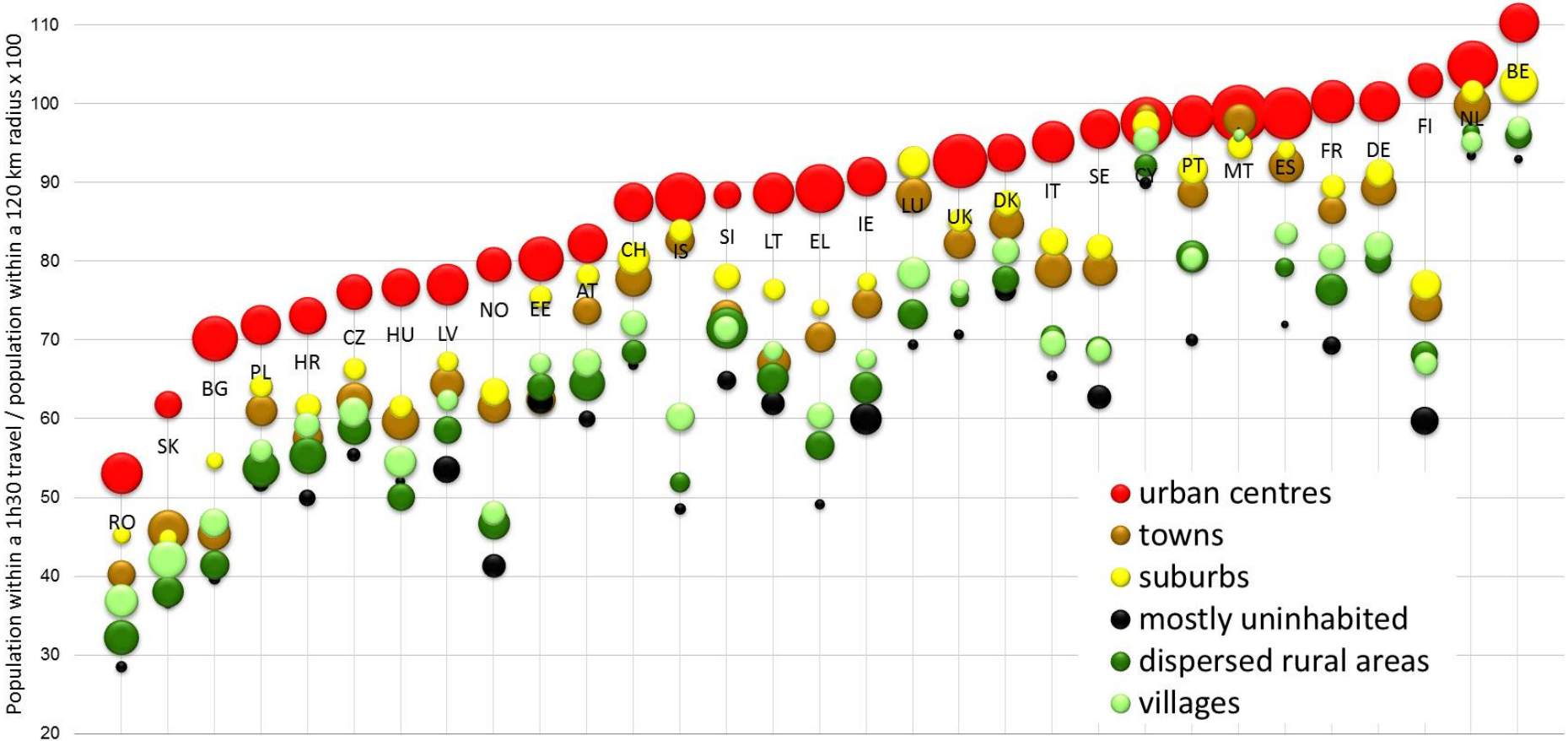


Bike + rail + walk



Bike + rail + bike

Transport performance by car, 2016

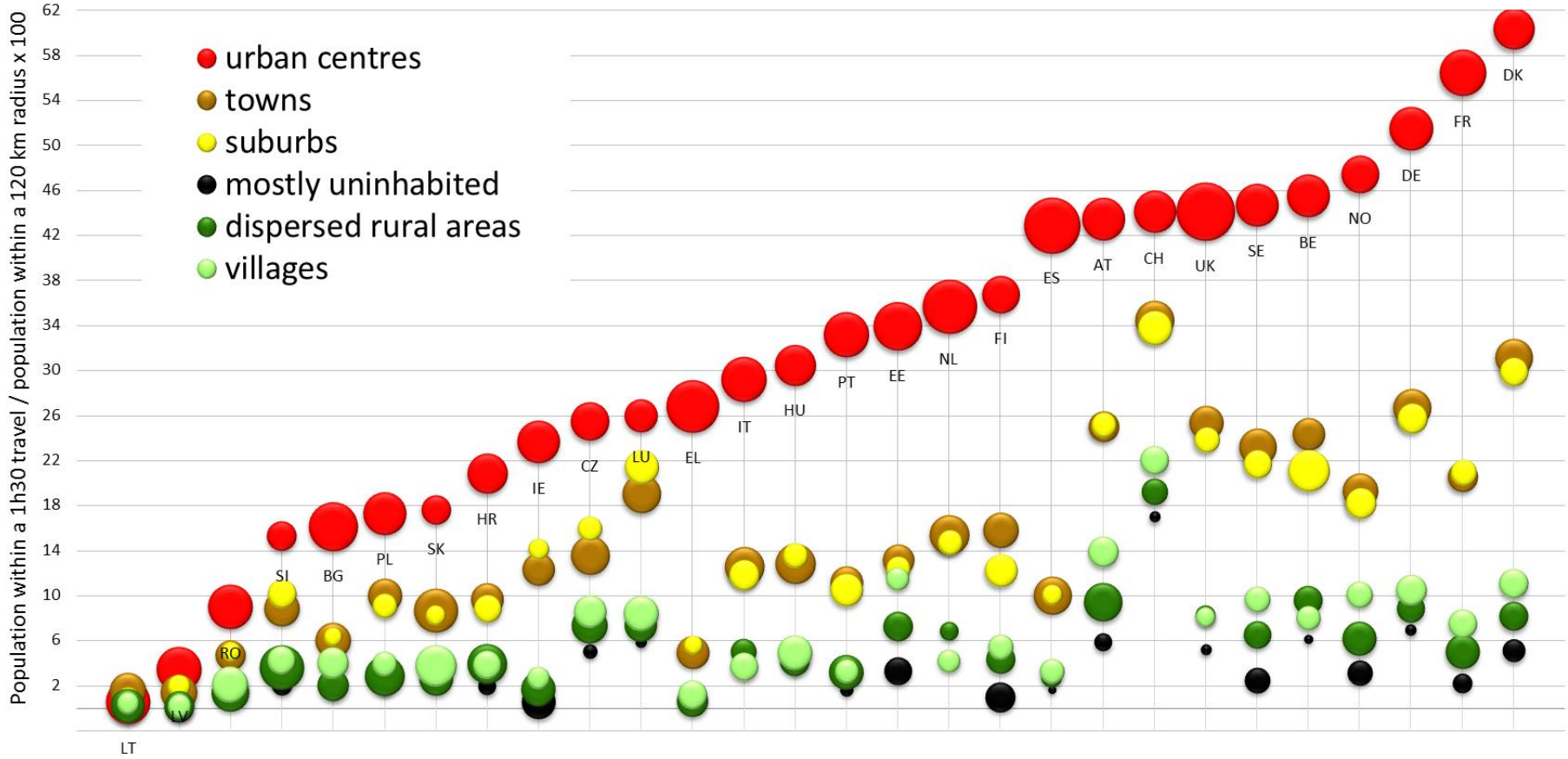


Note: Countries ranked by the value of urban centres

Source: REGIO-GIS

Bubble size is the share of national population living in the area

Transport performance (optimal travel time), bike + rail + bike, 2014



Note: Countries ranked by the value of urban centres; countries without railways are not shown

Source: REGIO-GIS

Bubble size is the share of national population living in the area

Territorial analysis opportunities

- Grid-based results allow flexible and scalable analysis
- Grid data available for re-use and analysis
- Combination with infrastructure characteristics and with population distribution patterns helps identifying strengths and weaknesses of transport systems

Conclusions

- This framework allows an objective, harmonized and comparable assessment of transport performance
- Can be used with other destinations (day time population, employment…)
- Test different distances and travel times
- Update network and population data
- Extend to public transport?
- Measure road performance with and without congestion

References

- Road transport performance in Europe (DG REGIO Working Paper)
  - https://ec.europa.eu/regional_policy/en/information/publications/working-papers/2019/road-transport-performance-in-europe
- Passenger rail transport performance in Europe (DG REGIO Working Paper): *forthcoming*
- Urban accessibility framework (ITF – OECD)
  - https://www.itf-oecd.org/sites/default/files/docs/accessibility-proximity-transport-performance_2.pdf
- Methodological manual on territorial typologies (Eurostat)
  - https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-18-008
- Multimodal travel information services Delegated Regulation (DG MOVE)
  - https://eur-lex.europa.eu/eli/reg_del/2017/1926/oj