



MOVING TOWARDS NEW URBAN CENTRALITIES: MULTIMODAL STATIONS

Managing Urban Mobility for achieving sustainable multimodal nodes



Andres Monzon
Civil Eng.

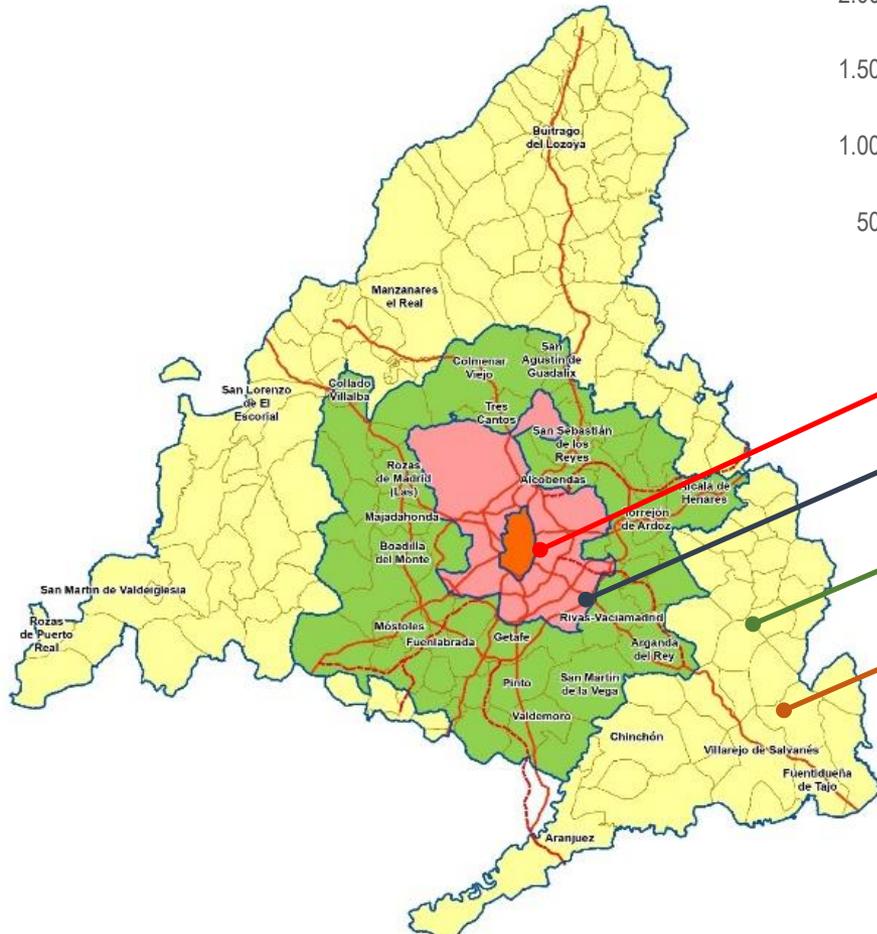
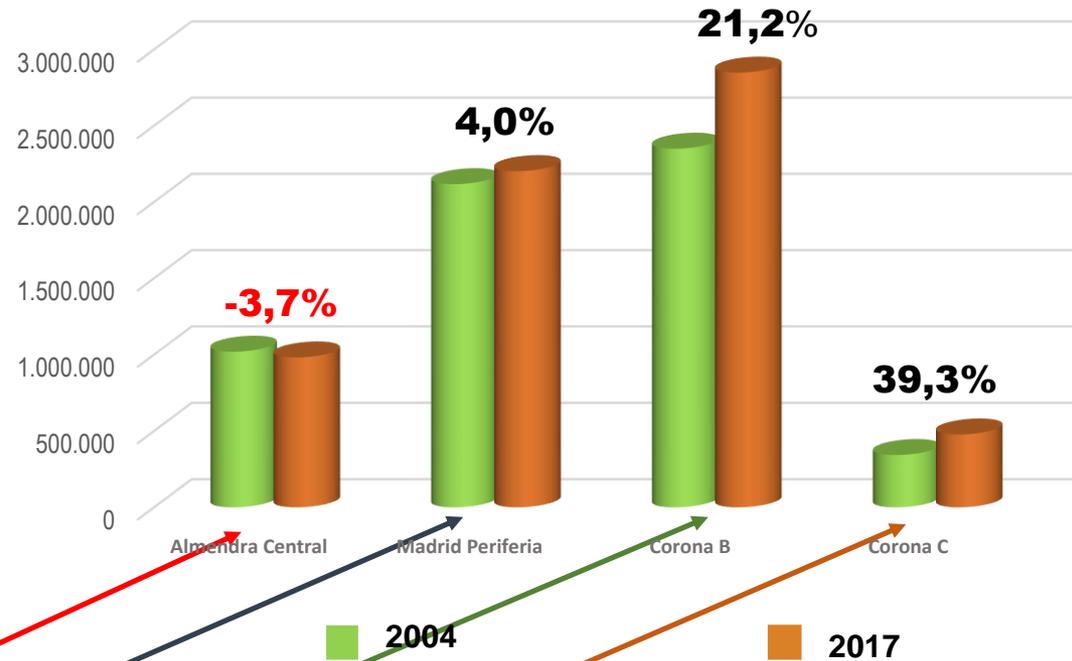


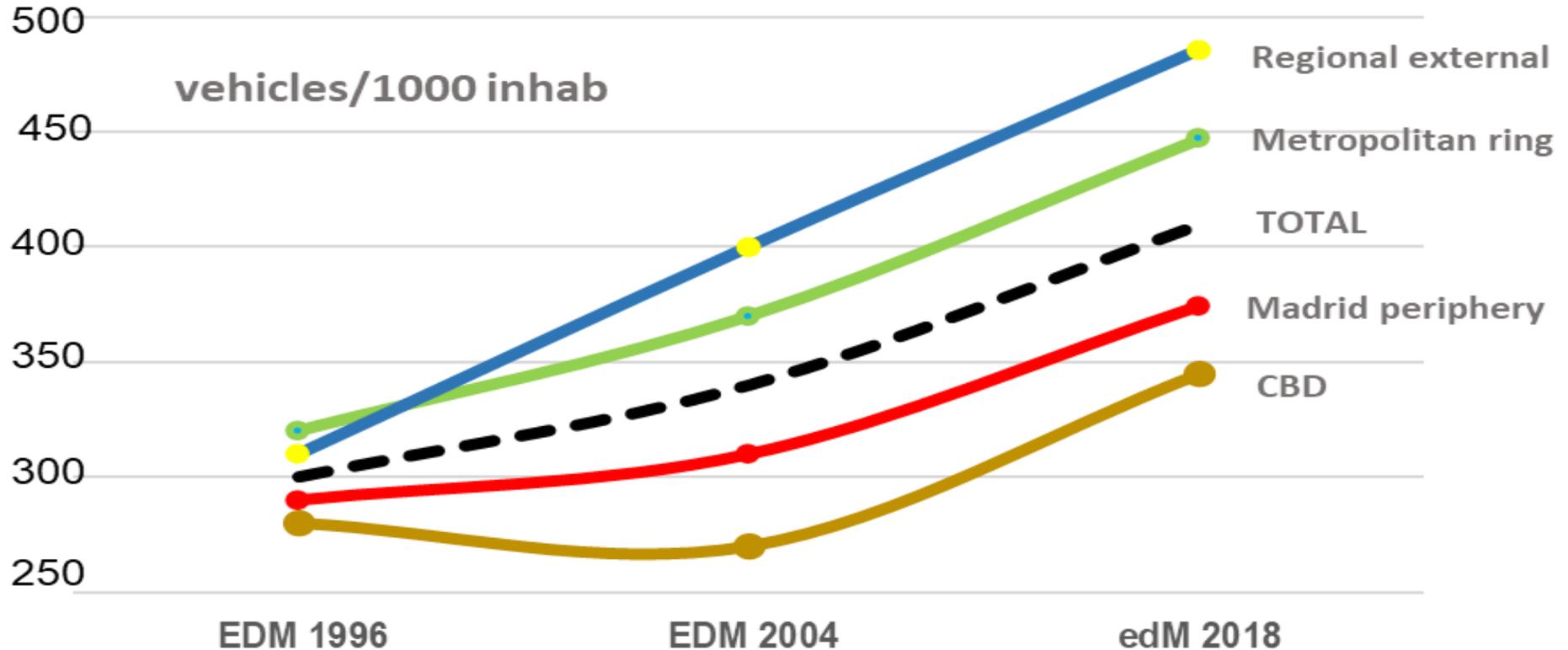
Nieves Navarro
Construction Eng.



- Most **Europeans live in cities: 75%**
- Over 60% live in around 1,000 medium-sized cities with over 50.000 inhabitants.
- Over **85%** of the EU's GDP is generated in urban areas, which act as drivers of regional or national economies.
- **Urban sprawl** is reducing population density and creating **social exclusion and polarisation**
- **Daily trips** are **longer** and more **car dependent**

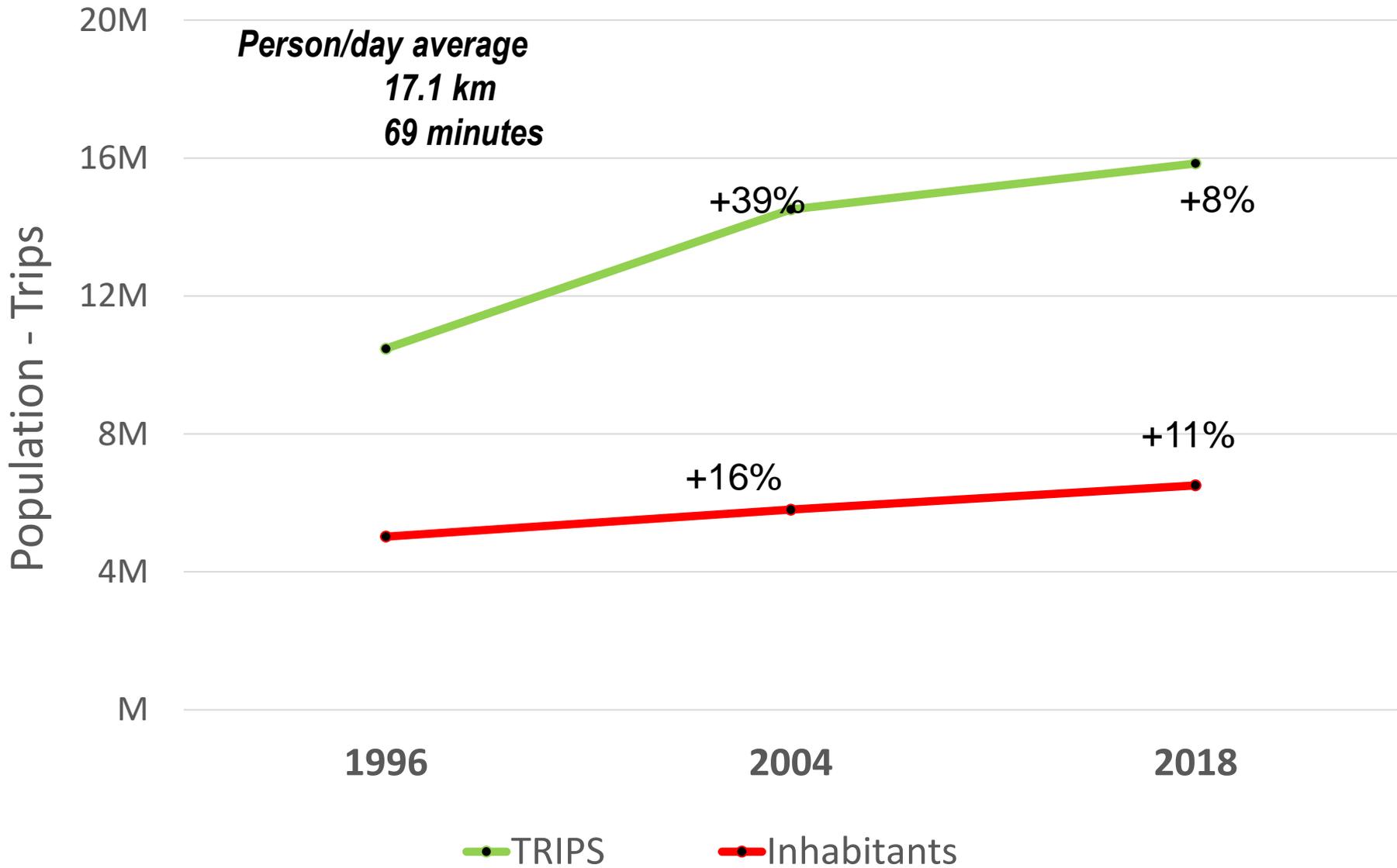
POPULATION



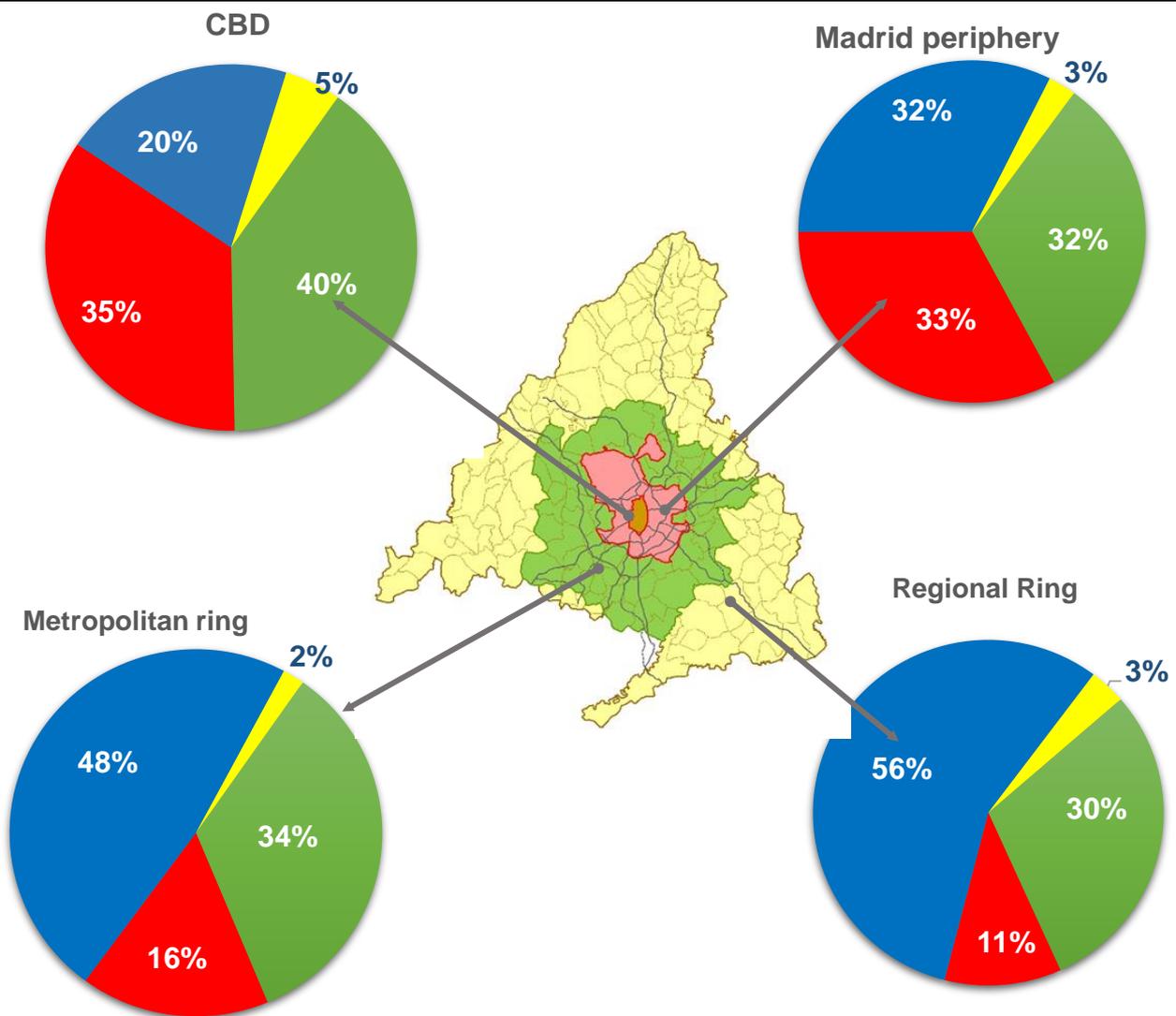


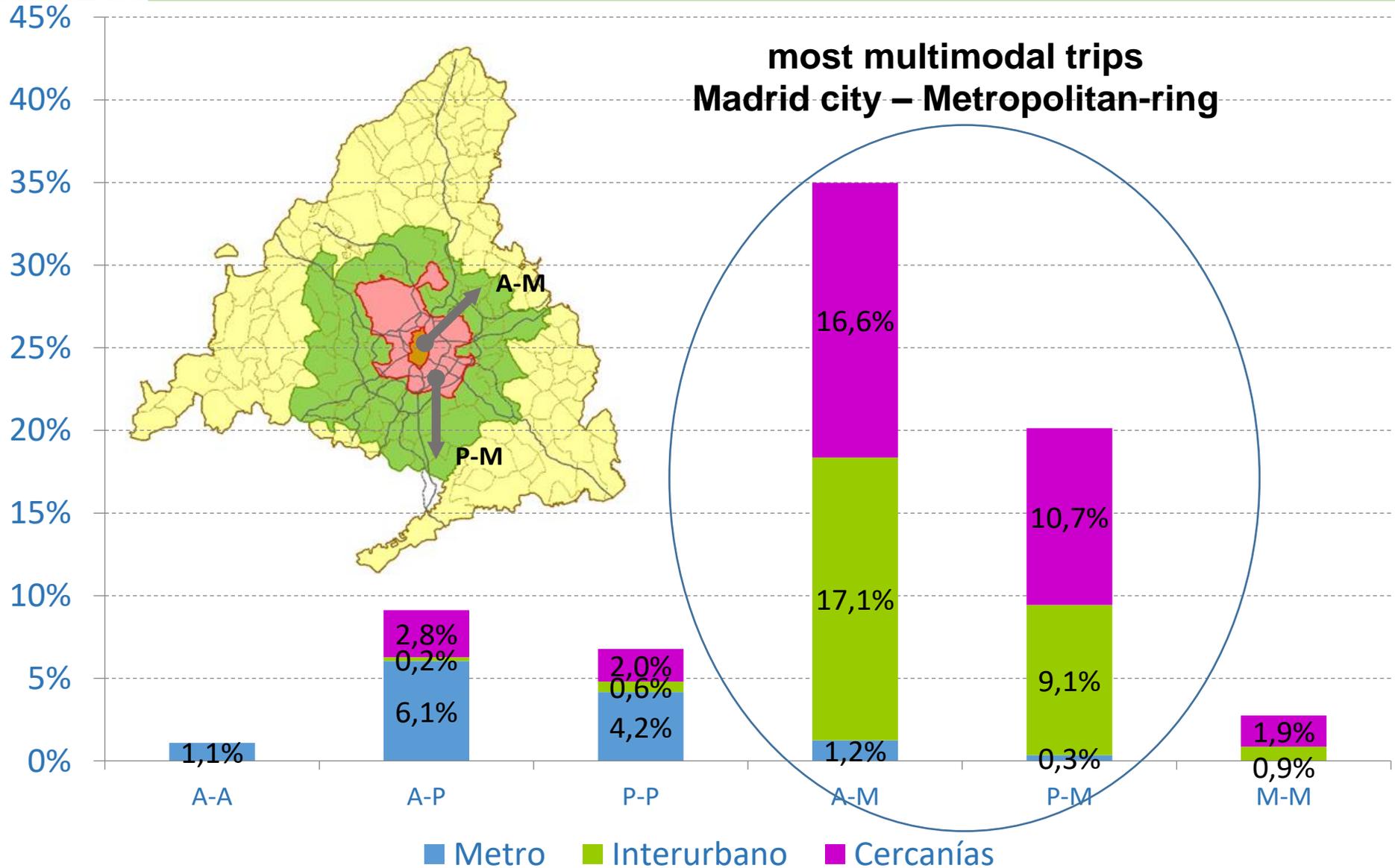
	No car	1 car	2 cars	3+ cars
CDB	39,8%	46,5%	12,3%	1,5%
Madrid periphery	31,7%	46,7%	18,8%	2,8%
Metropolitan ring	18,3%	43,8%	31,5%	6,4%
Regional external	13,9%	41,7%	35,9%	8,4%
Total Madrid Region	26,6%	45,2%	23,9%	4,3%

3. Movilidad global

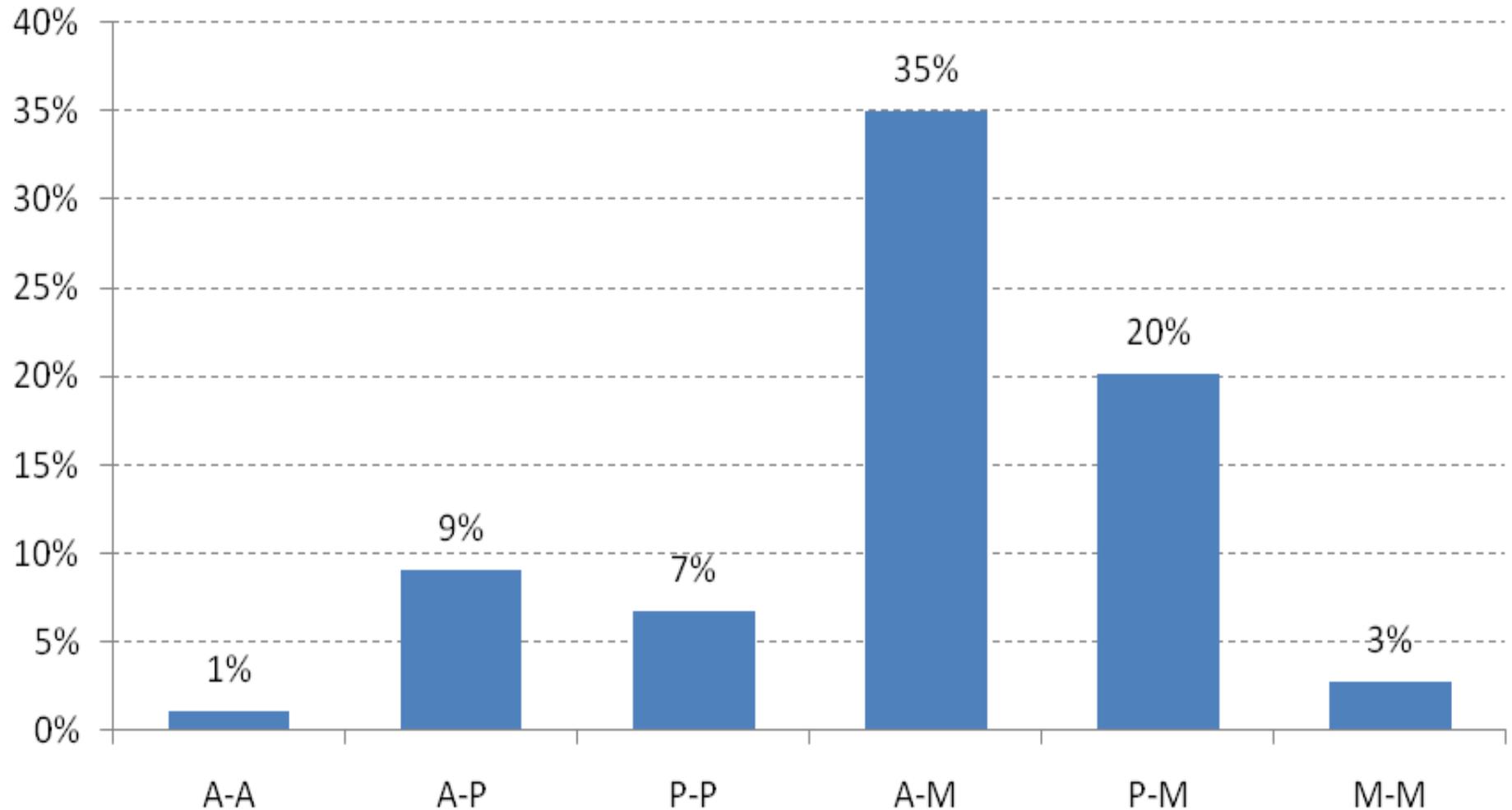


Sprawl: +car +multimodal trips



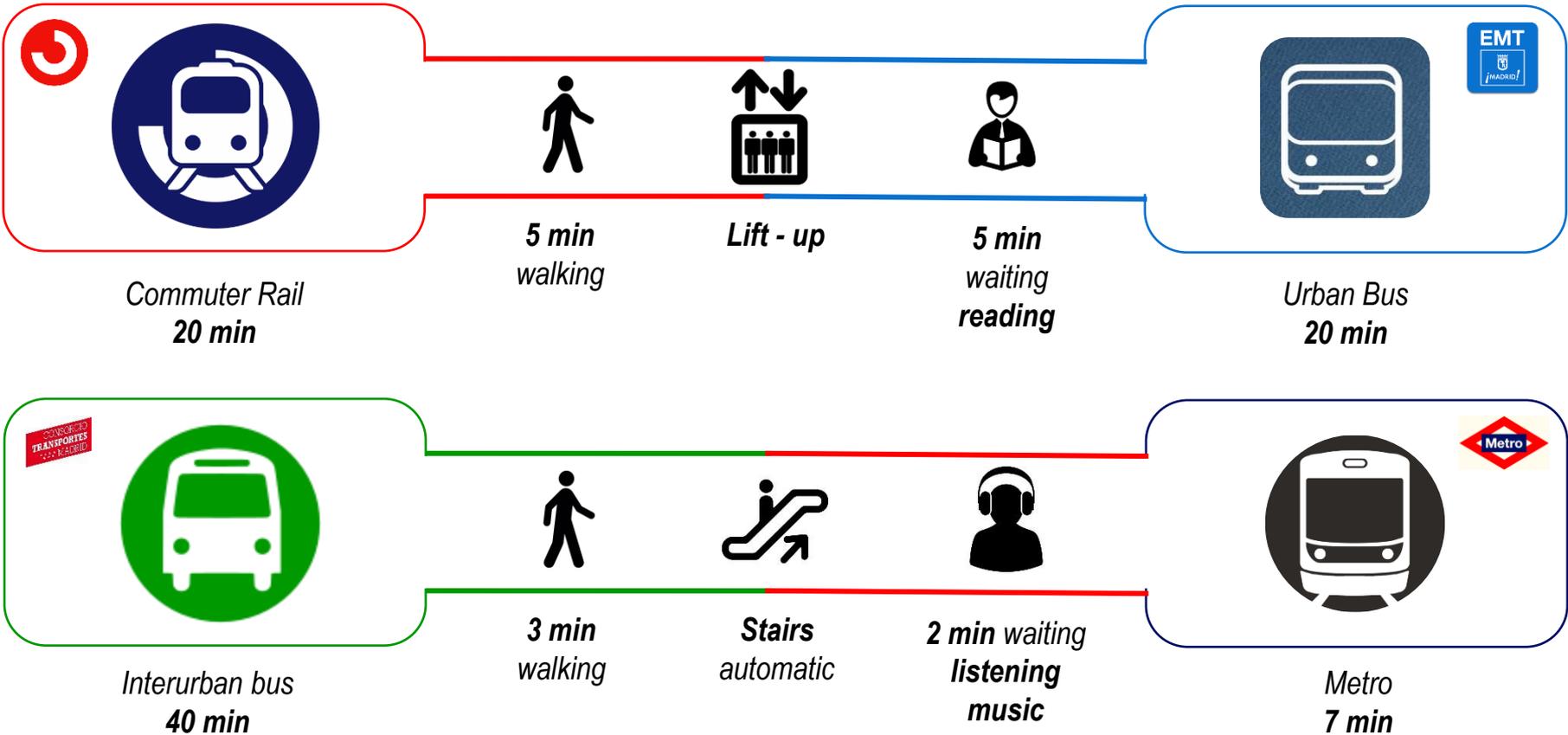


Trips with 2+ stages in Madrid (Public Transport)





PT transfer: **penalty** vs. car tips



To meet the challenges, transport has to:

- Use less energy
- Use cleaner energy
- **Exploit efficiently a multimodal, integrated and 'intelligent' network**



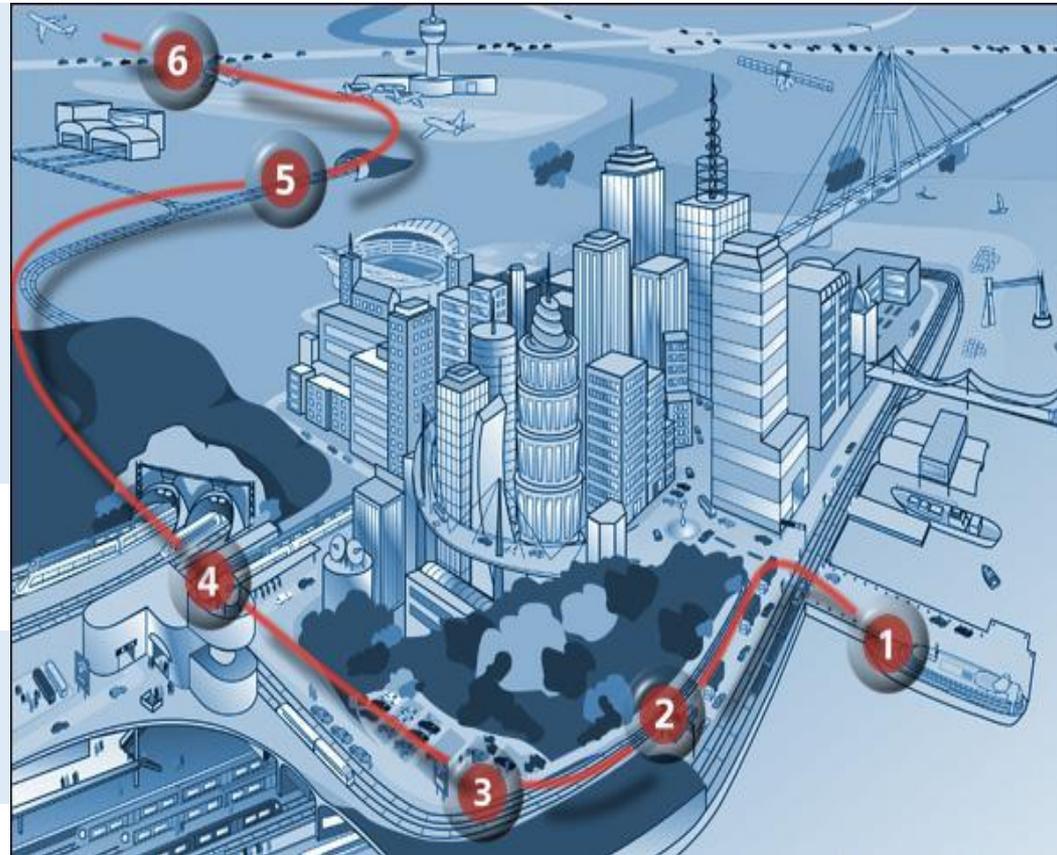
INTERCHANGES

Key nodes of the Public Transport system/network to achieve *seamless mobility*

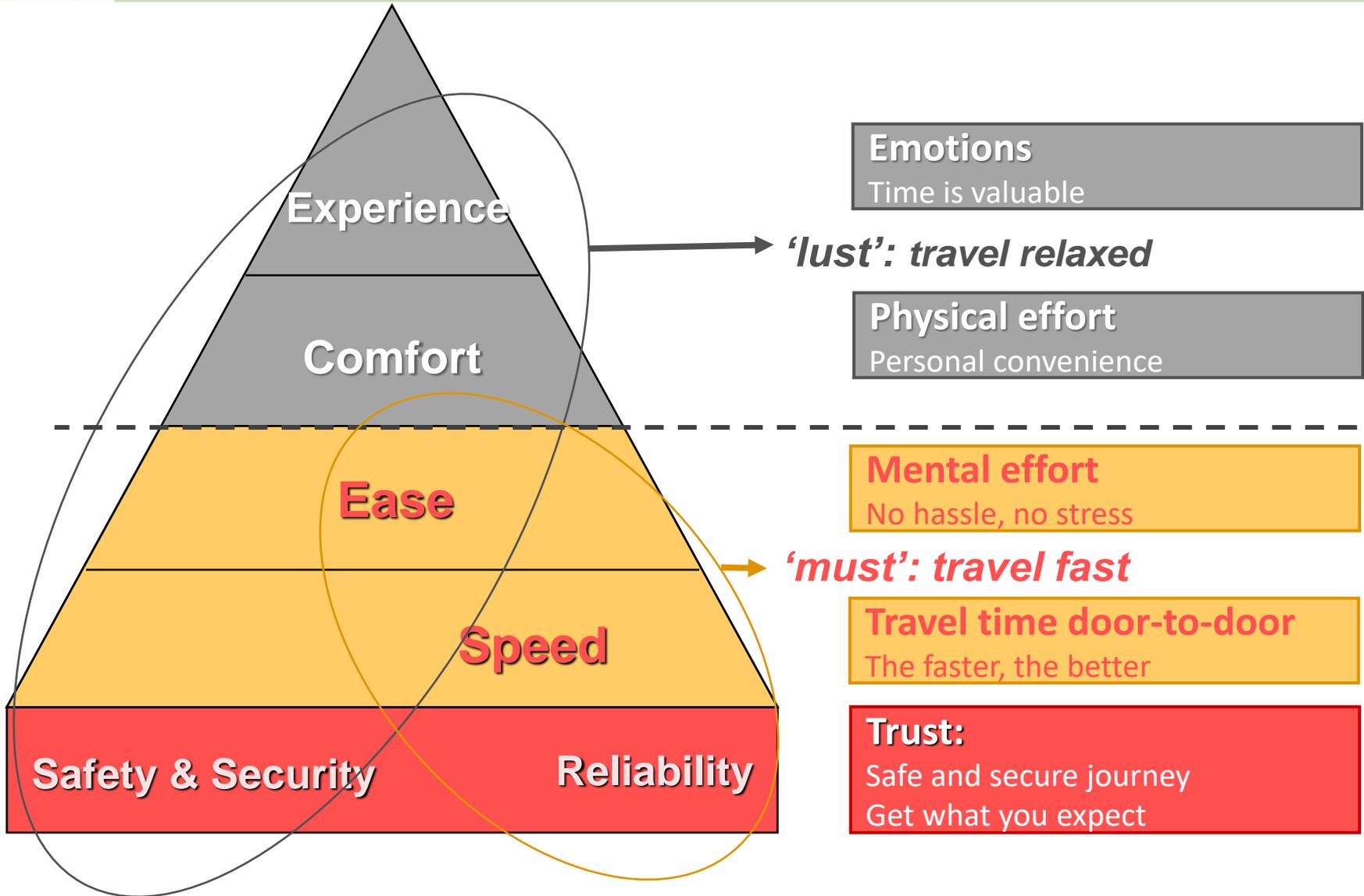
- ✓ Easy transfer
- ✓ No interruption of trip
- ✓ Benefits: complementary activities
- ✓ As much as possible to get 'door-to-door' trips



To compete with alternative car based trips



Pyramid of Traveller Needs



Mark Van Hagen, *Waiting Experience at train stations*, Doctoral Thesis, 2011

PASSENGER INTERMODALITY is a policy and planning principle that aims to provide a passenger using different modes of transport in a combined trip chain with a seamless journey

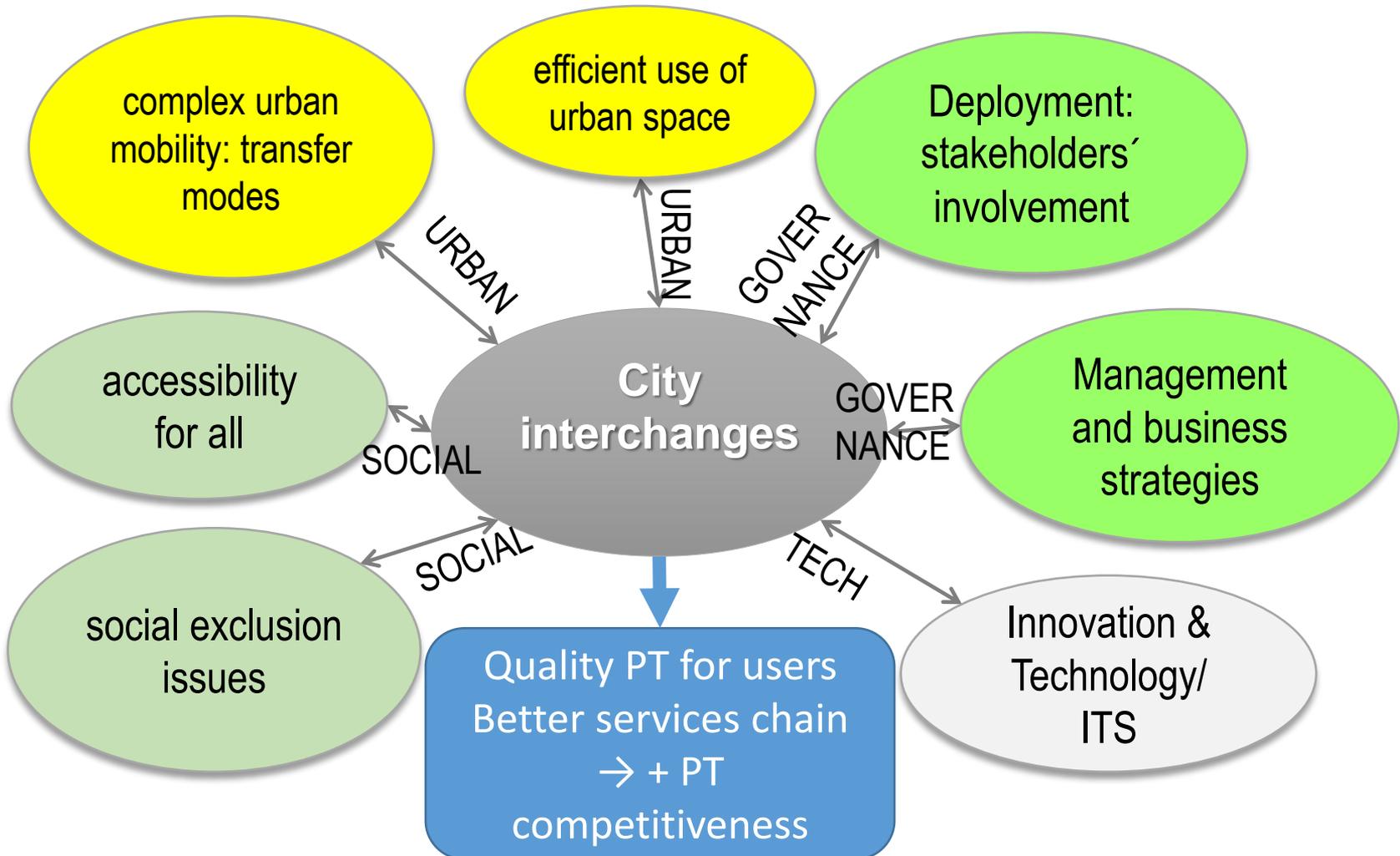
SEAMLESS JOURNEY refers to a transport system which can establish networks of interconnected modes, where transfer from one mode to another is easy and comfortable

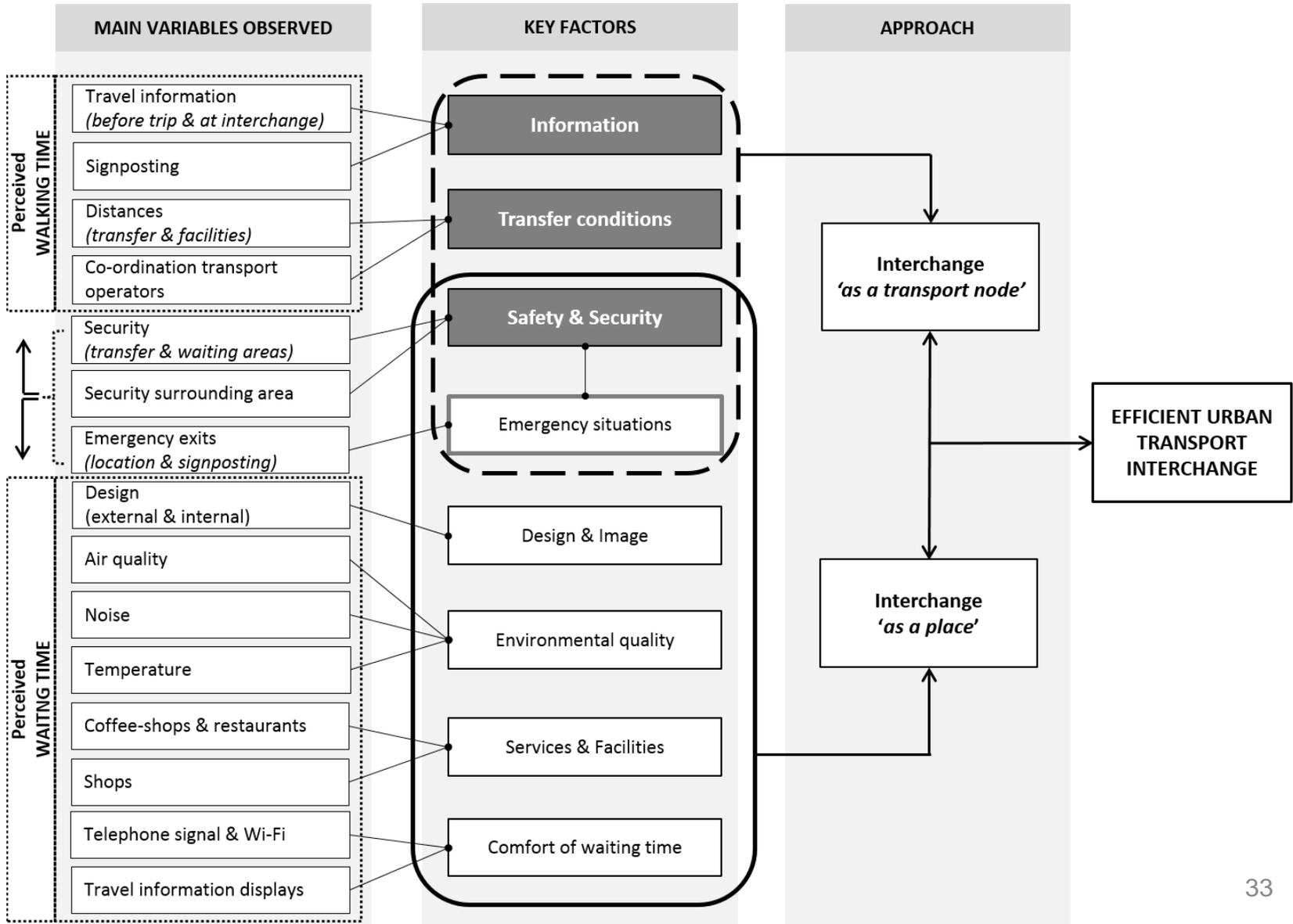
European Commission, 2004. Towards Passenger Intermodality in the EU

An efficient **urban transport interchange** must be **competitive** and, at the same time, be **attractive for users** given that their **physical experiences** and **psychological reactions** are **significantly influenced by the design and operation** of the interchange

(Terzis and Last, 2000)

SMART AND SUSTAINABLE URBAN MOBILITY





- Travellers make decisions based on perceived *WALKING* and *WAITING* TIMES
- An efficient urban transport interchange should fulfil four essential principles:

‘As a transport node’...

Reducing the waiting time:

- Transfer distances
- Coordination between operators

Making easier the use of the interchange, reducing the user’s stress feeling:

- Travel information provision
- Signposting

‘As a place’...

Making more comfortable the stay

- External and internal design
- Air quality, temperature and noise
- Information displays

Improving the use of time in the interchange

- Services and facilities
- Availability telephone signal & Wi-Fi

- **Safety and Security conditions** → psychological features indispensable for users, Directly linked to the overall performance of the interchange
 - Special attention in transfer and waiting areas and in the surroundings
 - Emergency exits should be clearly located and signposted, and perfectly identified

Monzón / Di Ciommo

CITY-HUBS

CITY-HUBs

Sustainable and Efficient Urban
Transport Interchanges



Andres Monzón and Floridea Di Ciommo



 **CRC Press**
Taylor & Francis Group

All people have the **right to move** safely and autonomously through **public spaces** and to use **public transport** without difficulty regardless their age, physical, sensory and cognitive abilities and situations.



Identify difficulties
for different users

Find Solutions
to all users

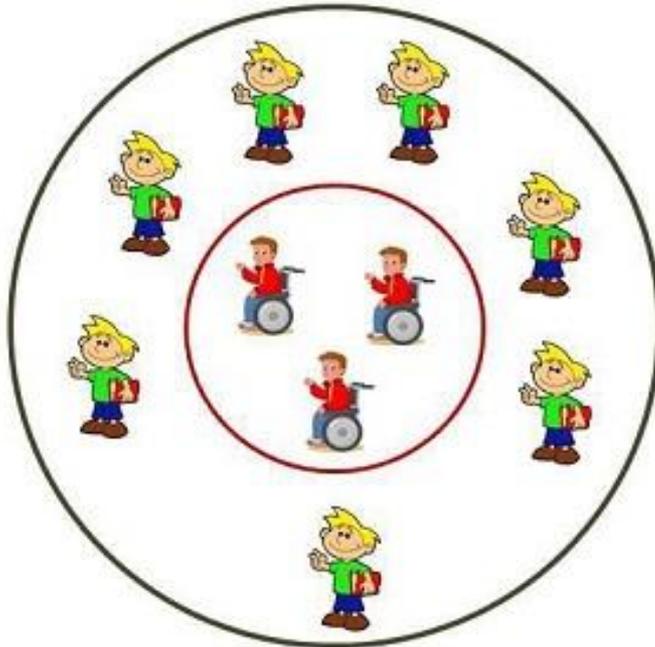
Accessibility
Design for All

- There are approximately one billion people with disabilities, which is **15% of the population**.
- Almost 200 million worldwide have significant difficulties.
- Seven out of ten people with disabilities live in urban settings.
- According to WHO statistics:
 - In 2050, for the first time in history of humanity, there will be **more elder than children**.
 - In 2052 population **over 64 years** will be 22% of the total population.

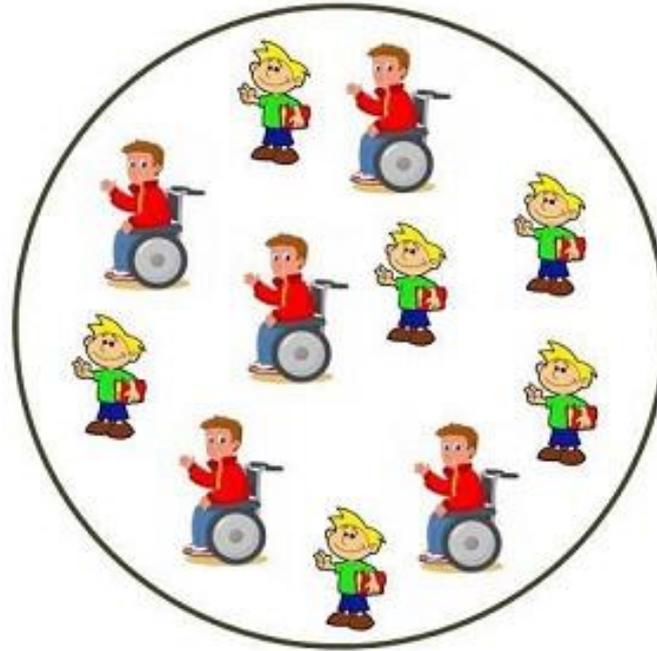


Disability will be a matter of concern in Mobility Management, as its prevalence increases, due to the aging of the population.

INTEGRACIÓN



INCLUSIÓN



Integration: Adaptation of the disabled person to a system. The person is not included or segregated, but he/she can participate in the system.

Inclusion: related to diversity. People are not the ones who must adapt to the system, but the system should be adapted to everyone needs.

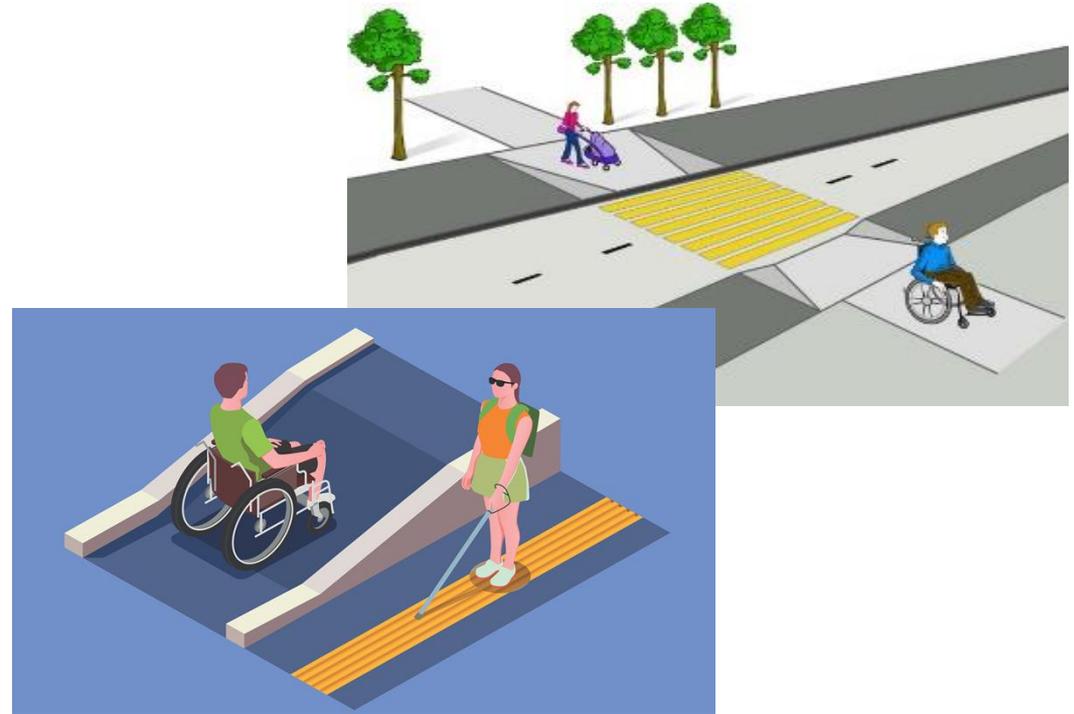
Design for All

+

Accessibility

=

Accessibility Management in
Public Services that requires
Training or workers



Accessibility criteria must be applied considering the needs of each user; it is different for a wheelchair user, a blind person, or hearing disability

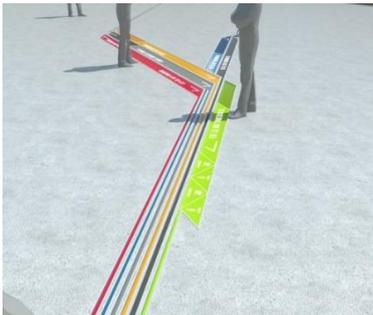
Accessibility includes various areas, as design of public facilities, furniture, signage, evacuation, vertical communication elements, itineraries at the same level, as well as specific measures for people with visual or hearing and intellectual disabilities





“Design for human diversity, social inclusion and equality.
“Good design enables, bad design disables”

Stockholm Declaration. 2004.
Design for All in Europa



Cognitive Accessibility Signage

Routing

Interchanges are multi-actor multi-modal human Interfaces

