

**22<sup>nd</sup>**

# **EUROPEAN WEEK** of **REGIONS** and **CITIES**

**Empowering Communities**

**7-10 October 2024**



**SMART & SUSTAINABLE**

#EURegionsWeek



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**REGIONS** and **CITIES**

Empowering Communities

**7-10 October 2024**



**"The first BRT in Portugal: the solution for a long and difficult journey"**

Teresa Jorge, Member of the Board of Directors of Metro Mondego

8<sup>th</sup> of October 2024

**#EURegionsWeek**



# Centro Region

## Economy and territory

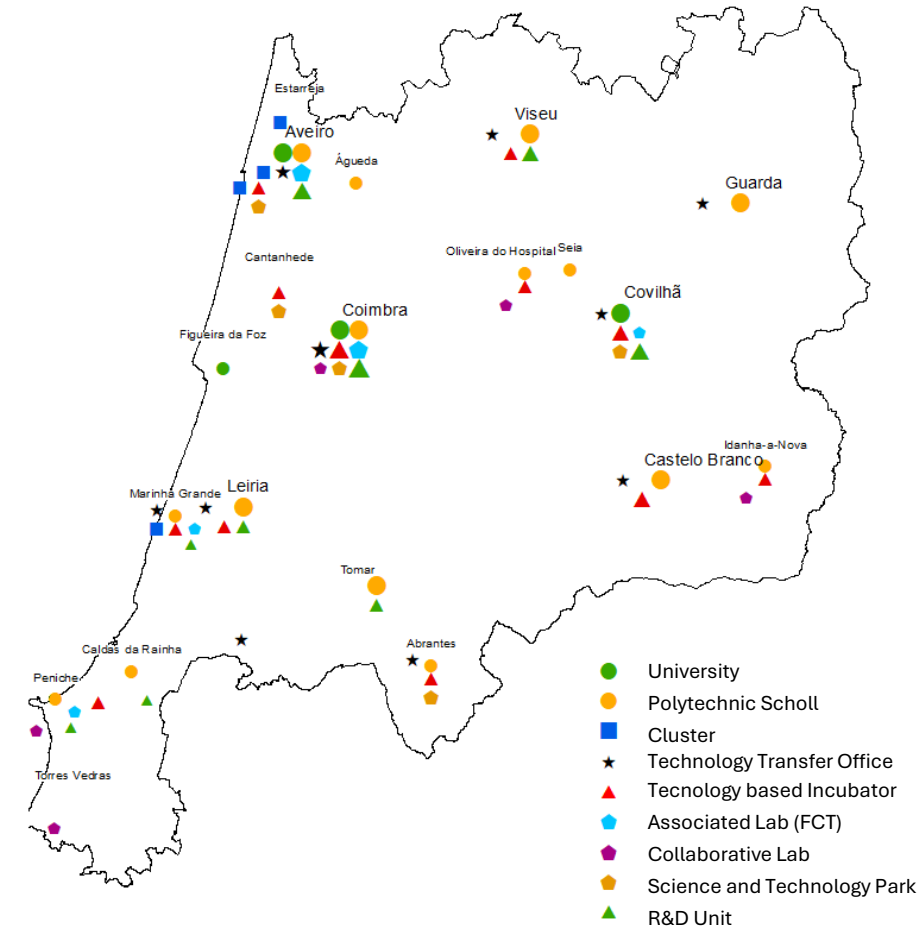
	Centro	% Portugal
<b>Population</b> (2022; millions of inhabitants)	2.256	21,6
<b>Area</b> (Km <sup>2</sup> )	28.200	30,6
<b>Gross Domestic Product, GDP</b> (2022; millions of euros)	45.000	18,6
<b>GDP <i>per capita</i></b> (2022; euros)	20.161	85,7
<b>GDP in PPS <i>per capita</i></b> (2022) (EU27 = 100)	67,4%	PT=78,7%
<b>Exports of goods</b> (2022; millions of inhabitants)	15.000	19,1
<b>Unemployment rate</b> (20-35 years)	6,9%	PT=8,2%



# Centro Region

## S&T ecosystem

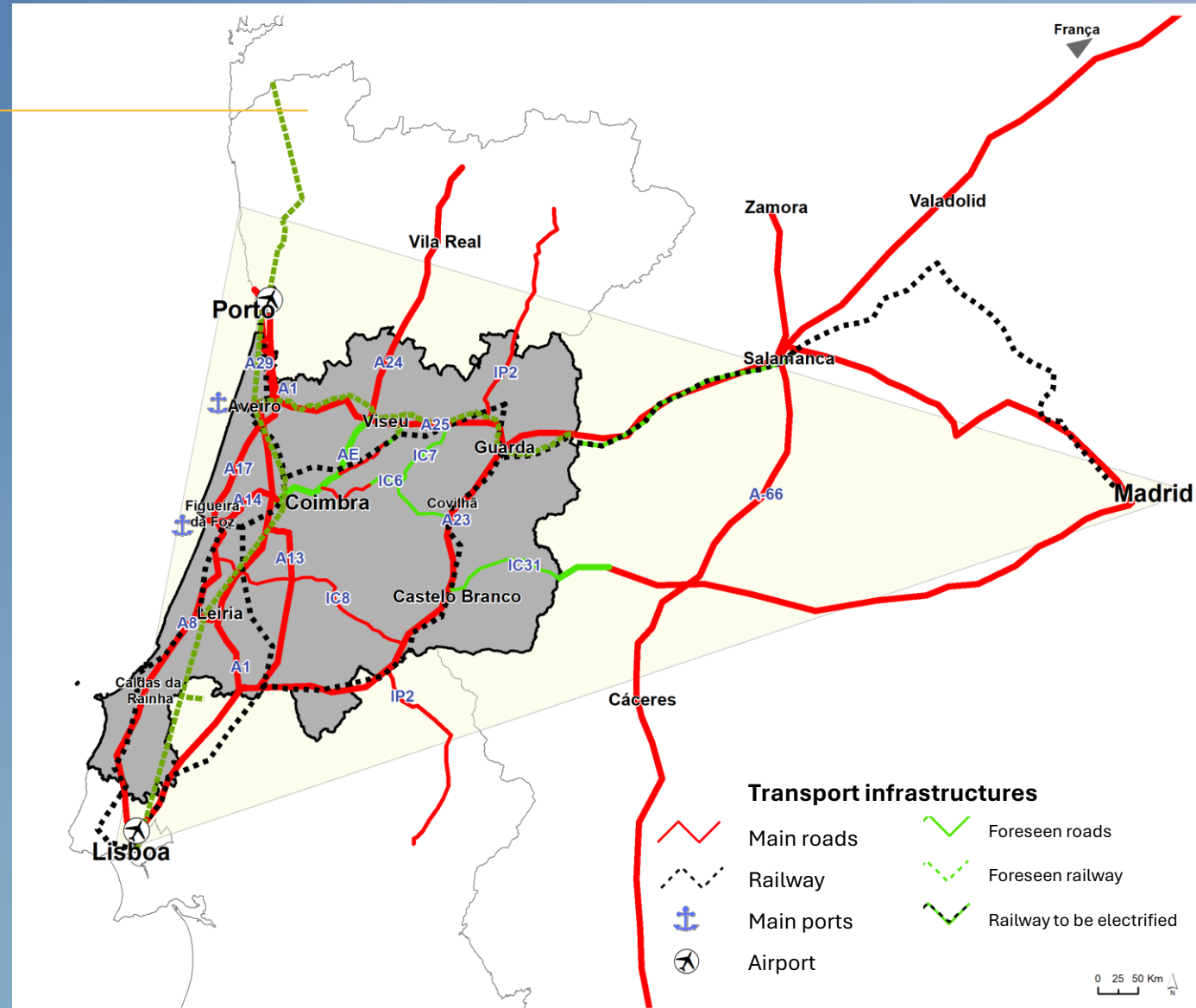
- Qualified and well distributed S&TS
- 91.500 students on higher education institutions
- 20.000 graduates *per year* (22% of Portugal)
- 30,4% of STEM students (higher % of Portugal)



# Centro Region

## Infrastructures and accessibility

- Good road network
- Railway for passengers and goods
- Sea ports : Aveiro and Figueira da Foz
- Proximity to two airports: Lisbon and Oporto
- Efficient logistics centers





# Mondego Mobility System



1906 Lousã railway line

1996 Start of the Project Light Rail

2010 Closure of Railway Service  
2011 Investment **suspension**

2015 European funding – Light Rail  
2016 Light Rail proposal **refusal**

2017 Study LNEC → BRT System

2019 European funding



# Overview of the project

## INFRASTRUCTURE

- » 2 lines (3 lines to be operated)
- » 42 km network
- » 42 stations

## VEHICLES

- » 35 + 5 electric articulated buses (batteries)

## ESTIMATED DEMAND

- » 13M passengers/year

## INVESTMENT (\*)

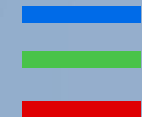
- » 171 M€ Basic Infrastructure (Road, Stations, Technical Systems)
- » 34 M€ Vehicles and Charging Systems
- » 15 M€ Other Investments (Depot, Ticketing)

**220 M€ Total**

(\*) – excluding VAT and inflation



- » Line Coimbra B - Serpins
- » Line Coimbra B - Hospital Pediátrico
- » Line Hospital Pediátrico- Serpins





# Territorial integration



Articulation with the high speed train project

## URBAN SECTION

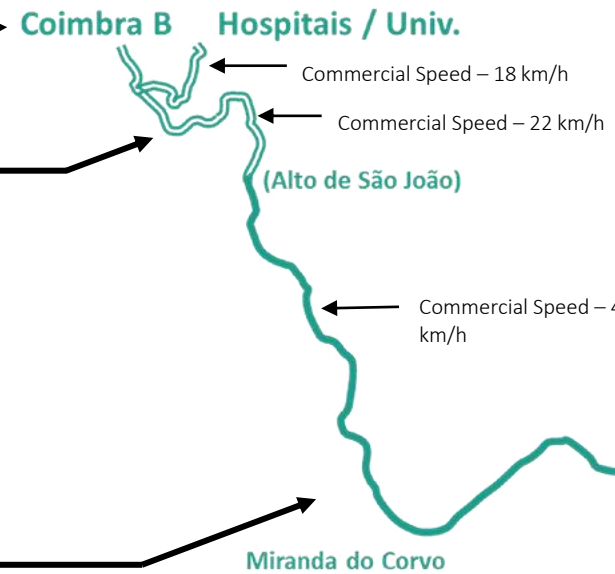
12 Km long

- » Double Track
- » Maximum speed: 50 km/h
- » Priority at intersections
- » Dedicated lane

## SUBURBAN SECTION

30 Km long

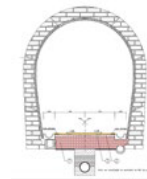
- » Single Track
- » Maximum speed: 70 km/h
- » Priority at intersections
- » Dedicated lane



Lousã Line follows the old Lousã railway line, except for the Solum Variant.



13 Bridges



7 Tunnels



24 road and pedestrian intersections



# Main options

## Road System

- Lower investment
- Adequate to the required capacity
  - Up to 5 000 passenger/hour direction - articulated vehicles
  - Up to 7.500 passenger/hour direction – bi-articulated vehicles
- Lower design constraints ⇒ easier urban integration
  - Smaller radius of curves
  - Steeper slopes



# Main options

## Dedicated Lane and priority at intersections

- Operation safety and passenger comfort

- Commercial speed

Journey Time: Similar journey times to *light rail*

Lousã – urban area

Train: **43'**

Present: **54'**

Metrobus: **39'**

- Frequency and reliability

Number of connections Lousã – Coimbra  
(direction/ business day)

Train: 17

Present: 38

Metrobus: 49





# Electric Vehicles

## ELECTRIC PROPULSION

- » Batteries

## CHARGING

- » Slow at Depot
- » Fast at line terminals

## OPERATIONS MANAGEMENT SYSTEMS

- » GPS Location
- » Communications Vehicle – Dispatch Centre
- » Passenger Information
- » Video Surveillance

## DRIVING ASSISTANCE SYSTEMS

- » Automatic Optical Guidance
- » Intelligent Speed Assistance (active)
- » Collision Warning System (passive)

**Number of Vehicles: 35 + 5 (option)**

Articulated vehicles 18.75 meters long  
Capacity for 136 passengers



LEVEL ACCESS BETWEEN THE PLATFORM  
AND THE VEHICLE

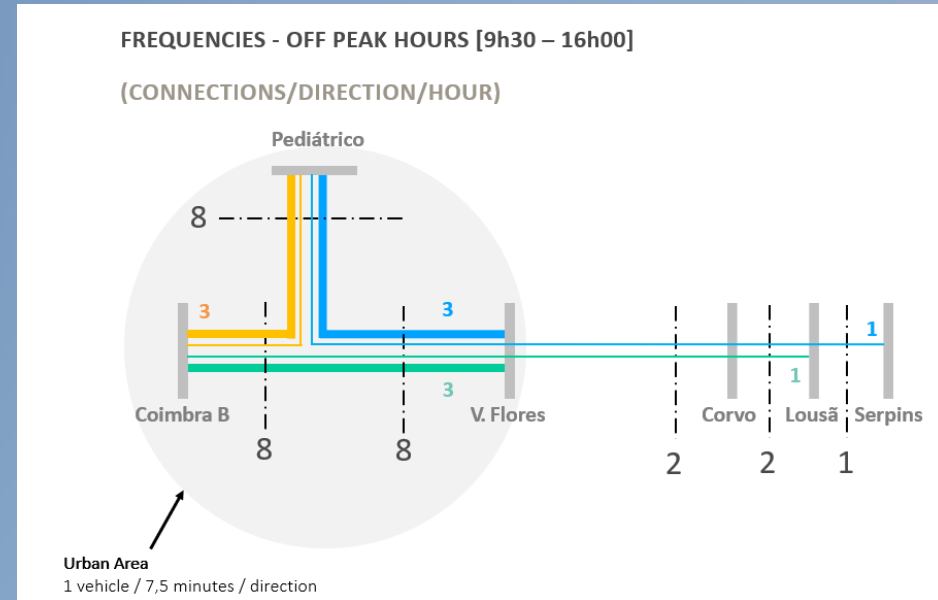
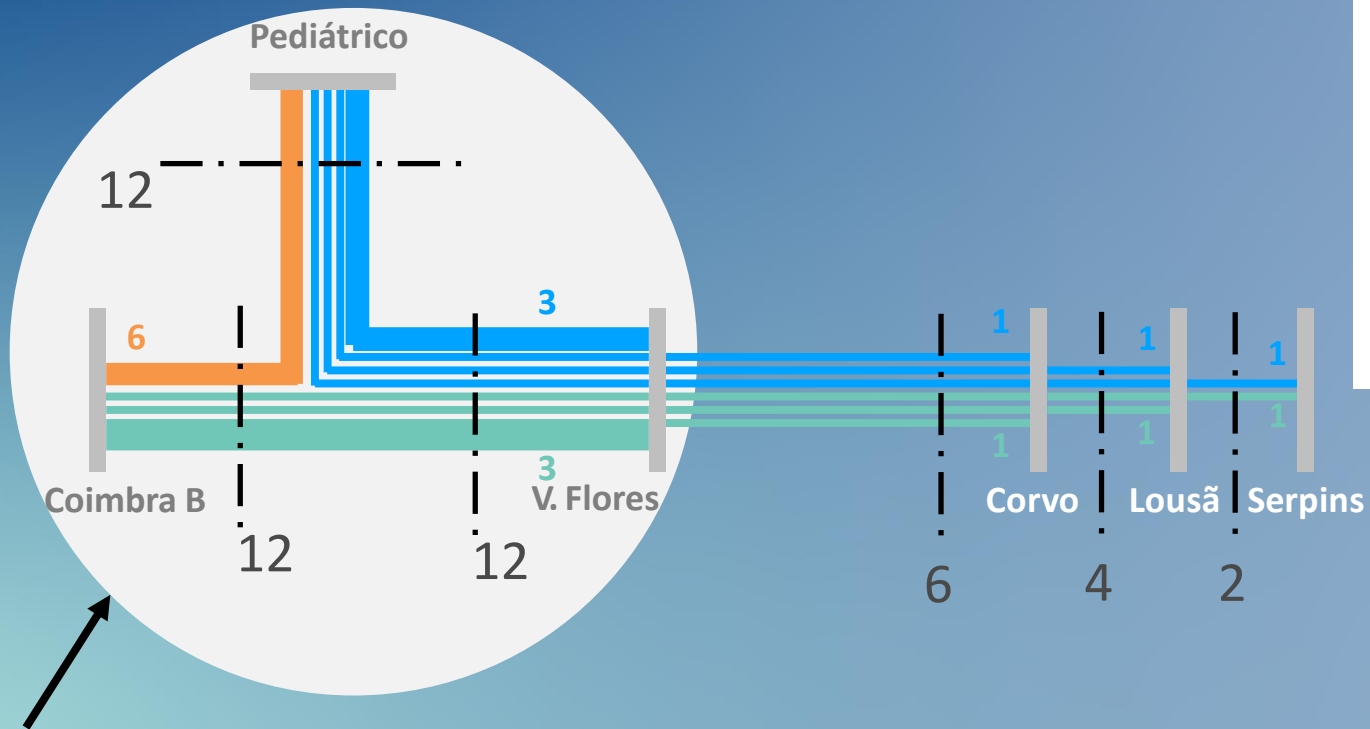


VALIDATION ON THE PLATFORM

# Frequency

FREQUENCIES – PEAK HOURS [7:30 – 9h30; 16h00 – 19h00]

(CONNECTIONS/DIRECTION/HOUR)



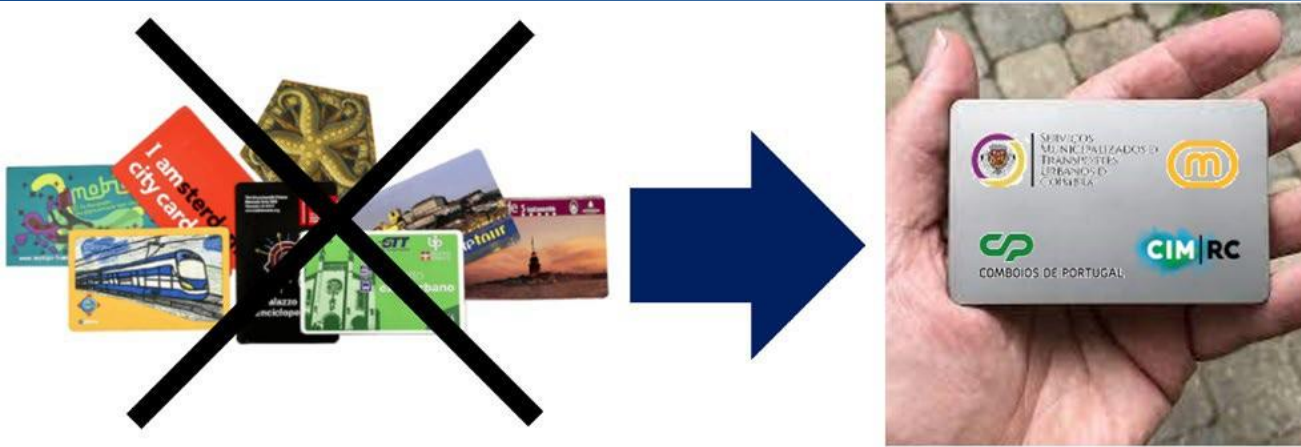
- Serpins – Pediátrico
- Serpins – Coimbra B
- Coimbra B – Pediátrico

Urban Area  
1 vehicle / 5 minutes / direction





# Integration with other modes



Physical Integration with train and other modes of transport

Ticketing and Tarif Integration



# Expected results



Significant contribution to modal transfer in the three Municipalities, namely in Coimbra: from 17% to 35% of public transport use

Global Demand : **13 M passengers / year**  
( $\approx$  45 K passengers / day;  $\approx$  5 K passengers / hour (rush period))

GGE Reduction - **18 907 ton CO<sub>2</sub>eq / year**



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The Mondego Mobility System  
is a project cofunded by:

**SUSTENTÁVEL  
2030**  
PLANO DE ACÇÃO CLIMÁTICA  
PORTUGAL 2030

**PORTUGAL  
2030**

 **Cofinanciada pela  
União Europeia**

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