metro mondego

METROBUS PROJECT

EUI Peer Review
Coimbra Study Visit

29th November 2023

Co-funded by the European Union

INDEX

Concept

INFRASTRUCTURE

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

VEHICLES

» **35** + 5 **electric** articulated buses (batteries)

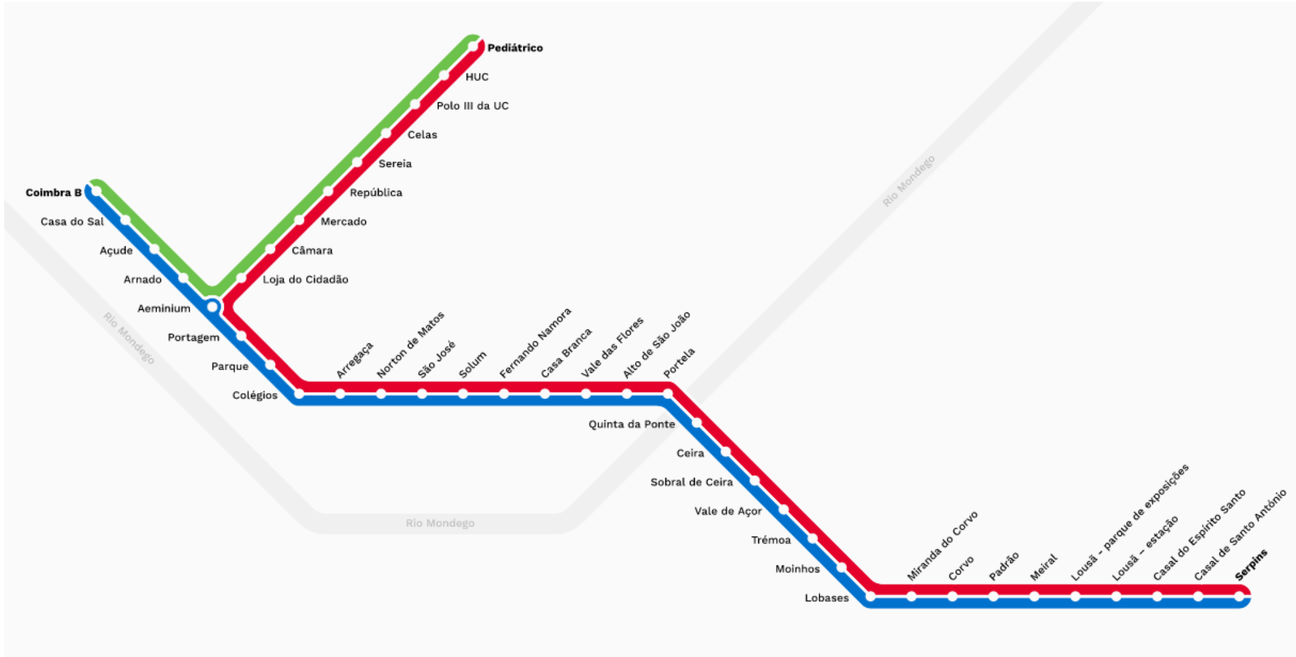
ESTIMATED DEMAND

» **13M** passengers/year

INVESTMENT (*)

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

166 M€ Total

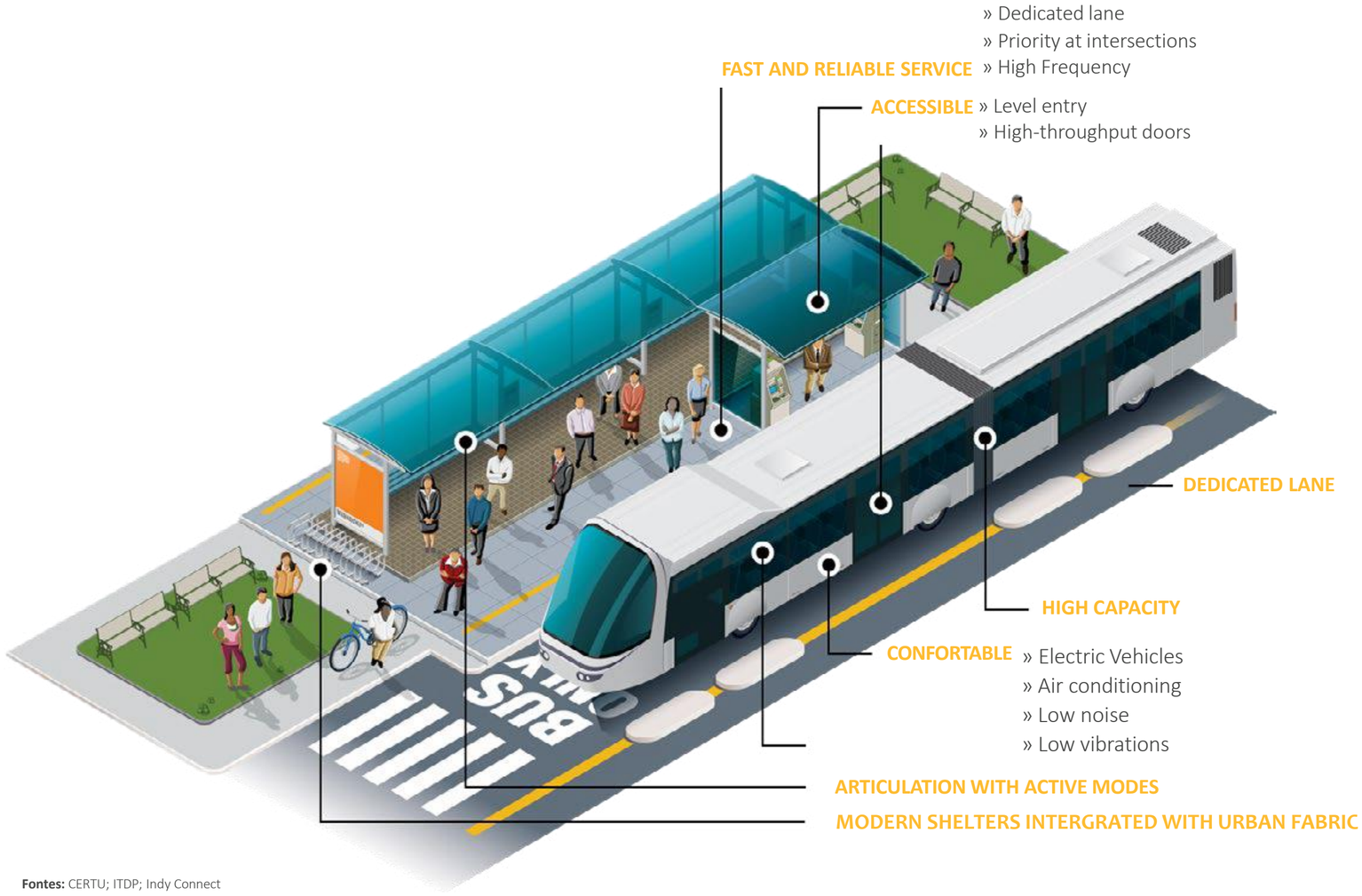


» Line Coimbra B - Serpins
» Line Coimbra B - Hospital Pediátrico
» Line Hospital Pediátrico- Serpins

(*) – ecluding VAT and inflation

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- Stations
- High Frequency
- Integration with other modes



Fontes: CERTU; ITDP; Indy Connect

Concept

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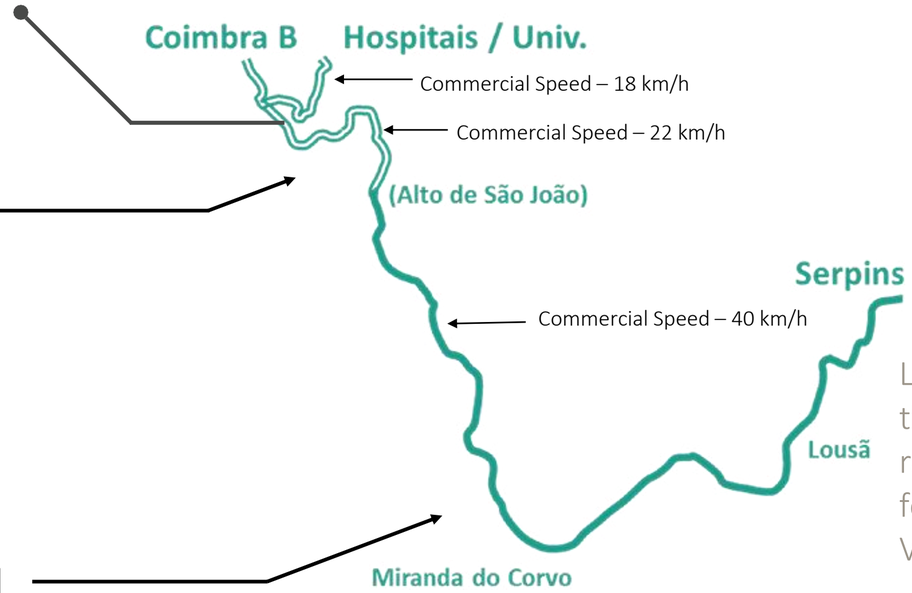
Articulation with the high speed train project



URBAN SECTION

12 Km long

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

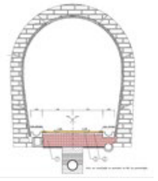
SUBURBAN SECTION

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

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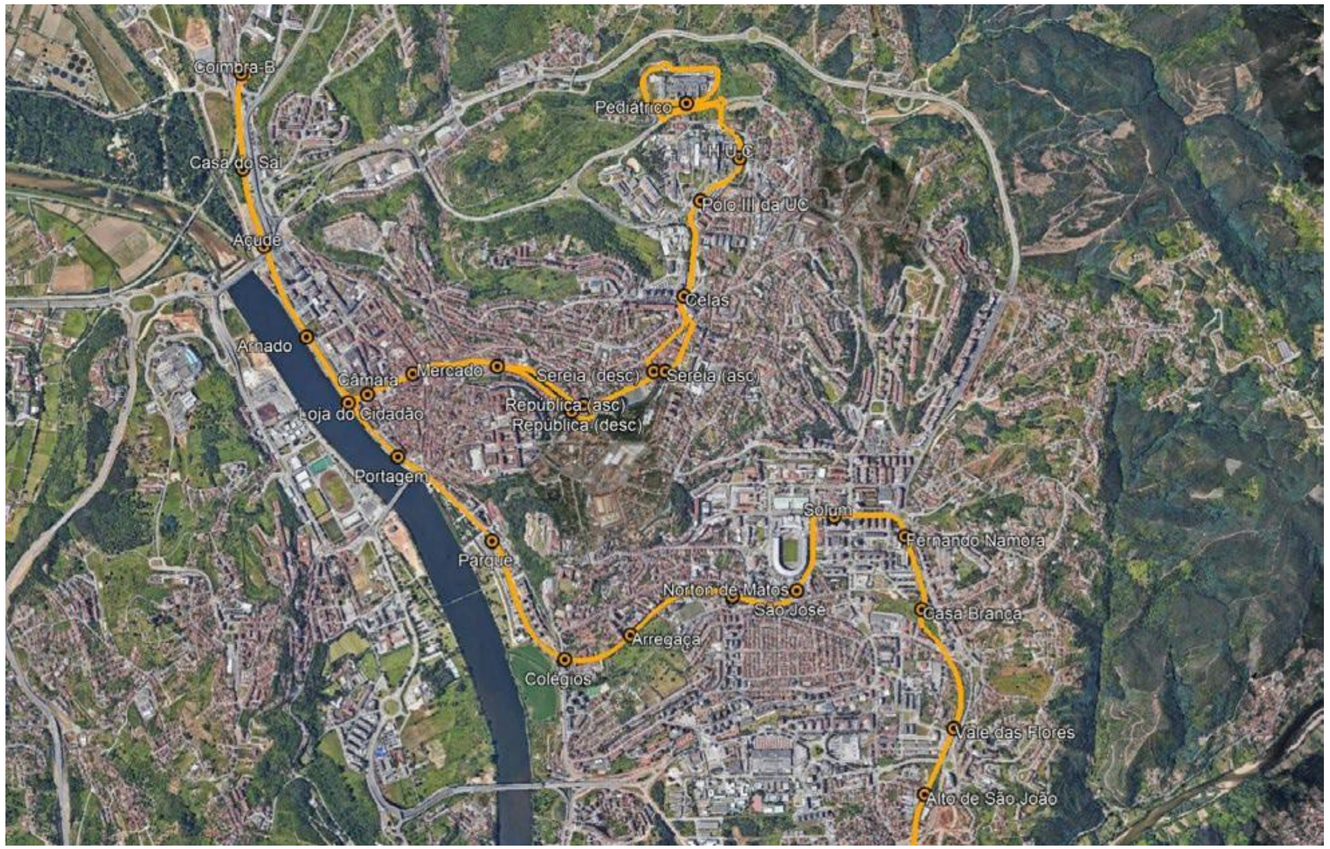

» High Urban Density in Central Area

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- Stations
- High Frequency
- Integration with other modes

» Urban Integration nearby Parque Station

Concept

- BRT (Bus Rapid Transit)/BHLS
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D. João III Street

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
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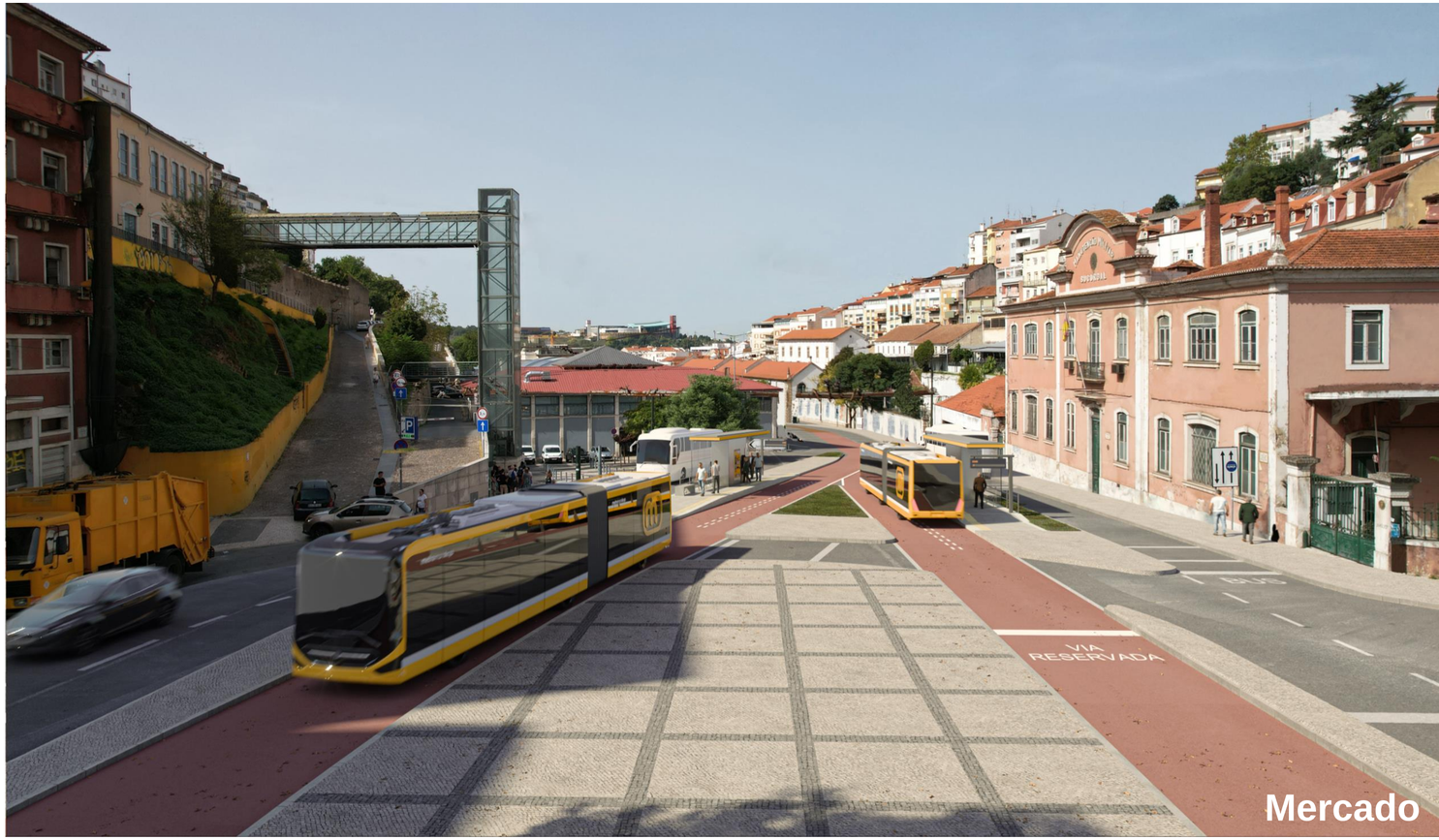

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- **Electric Articulated Buses**
- Stations
- High Frequency
- Integration with other modes

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

Cost: **32,9** M€ investment + **10,3** M€ maintenance

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
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- **Electric Articulated Buses**
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- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
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Electric Propulsion

» Batteries

Charging

» Slow at Depot
» Fast at line terminals

Driving Assistance Systems

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

Operations Management Systems

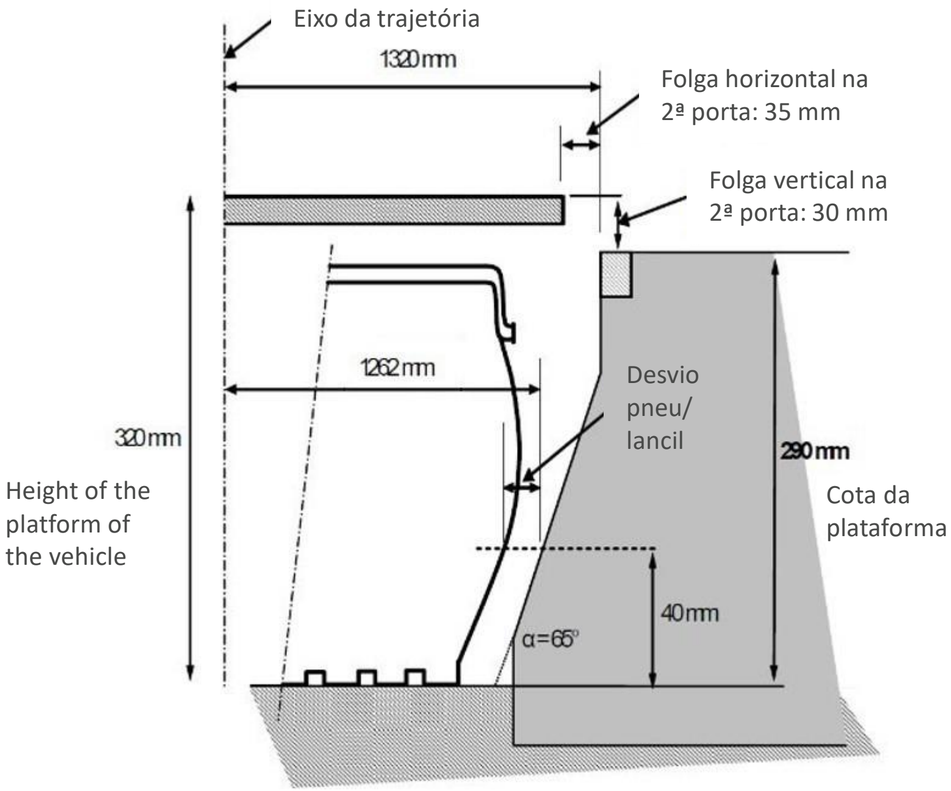
» GPS Location
» Communications Vehicle – Dispatch Centre
» Passenger Information
» Video Surveillance

Veículos articulados com 18,75 metros de comprimento

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- **Stations**
- High Frequency
- Integration with other modes

LEVEL ACCESS BETWEEN THE PLAFORM AND THE VEHICLE



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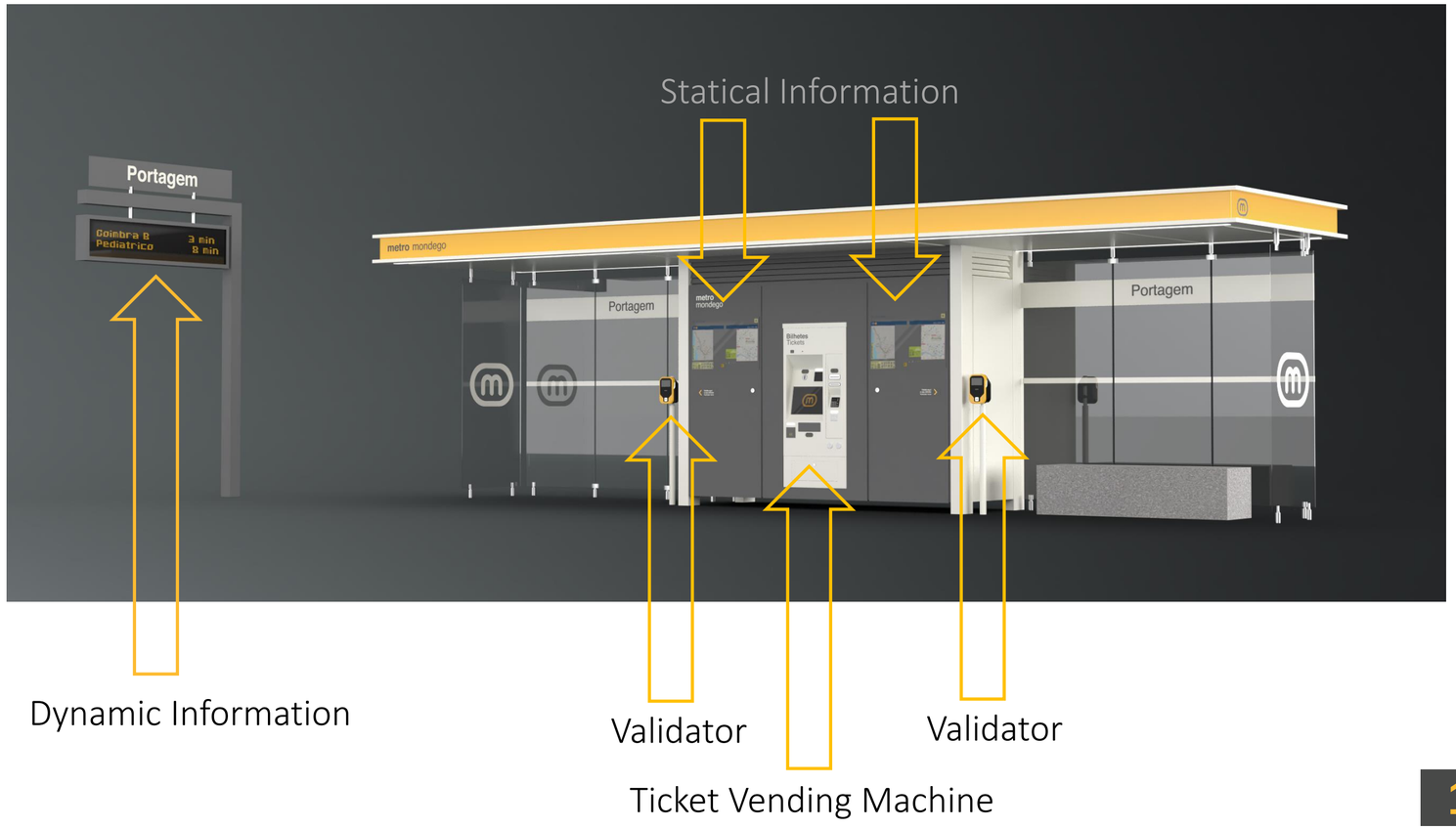

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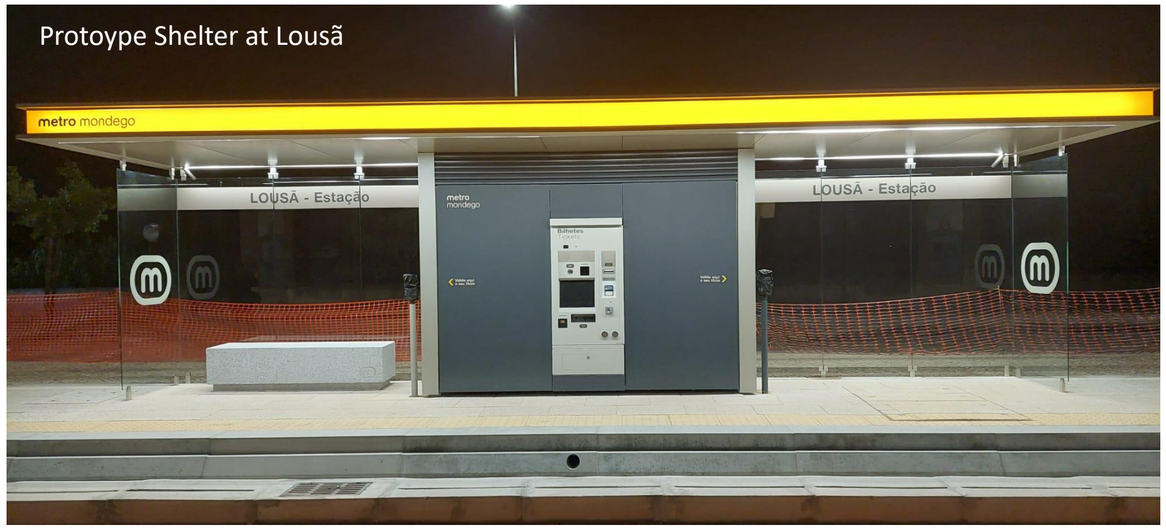

Protoype Shelter at Lousã

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
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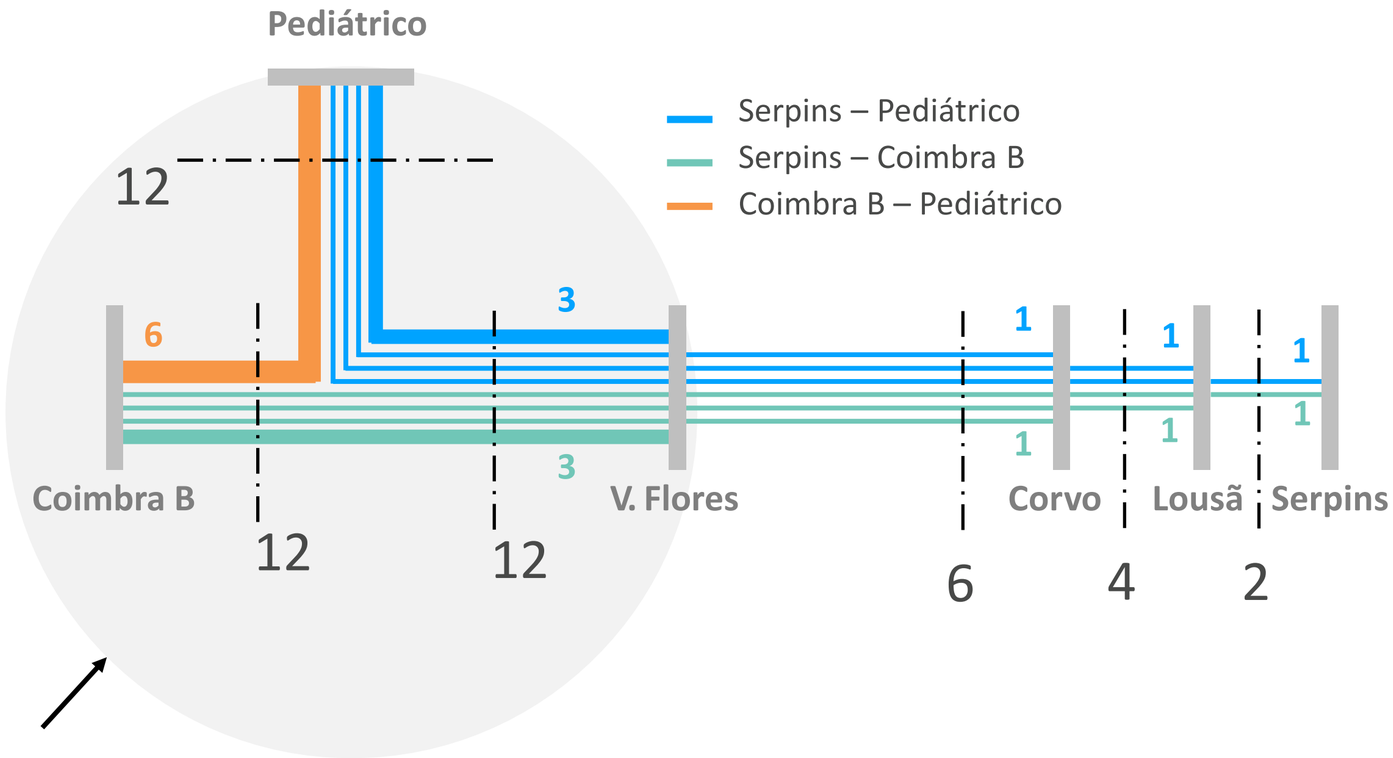
- Electric Articulated Buses
- Stations
- **High Frequency**
- Integration with other modes

FREQUENCIES – PEAK HOURS

(CONNECTIONS/DIRECTION/HOUR)



Urban Area
1 vehicle / 5 minutes / direction

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
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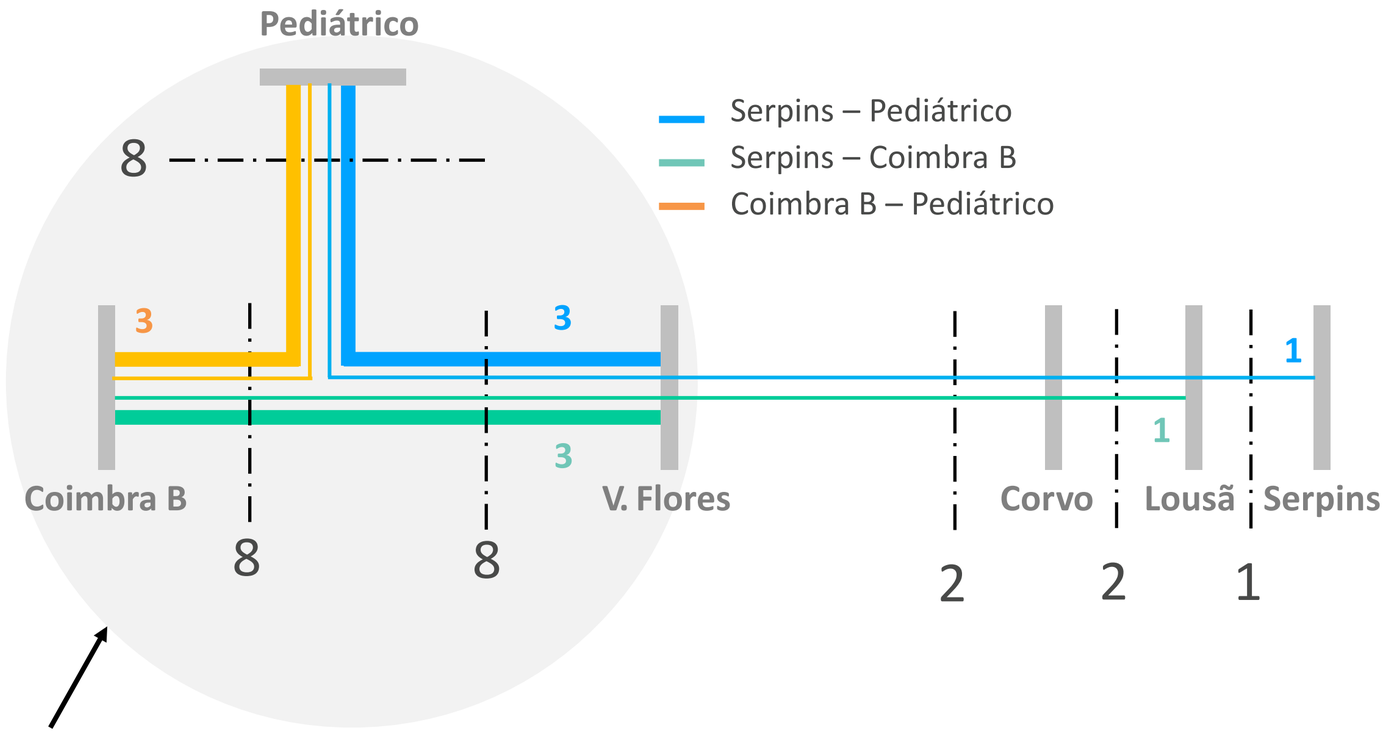
- **High Frequency**
- Integration with other modes

FREQUENCIES - OFF PEAK HOURS

(CONNECTIONS/DIRECTION/HOUR)



Urban Area
1 vehicle / 7,5 minutes / direction

Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- Stations
- High Frequency
- **Integration with other modes**

Physical Integration at Train Station (Coimbra B)

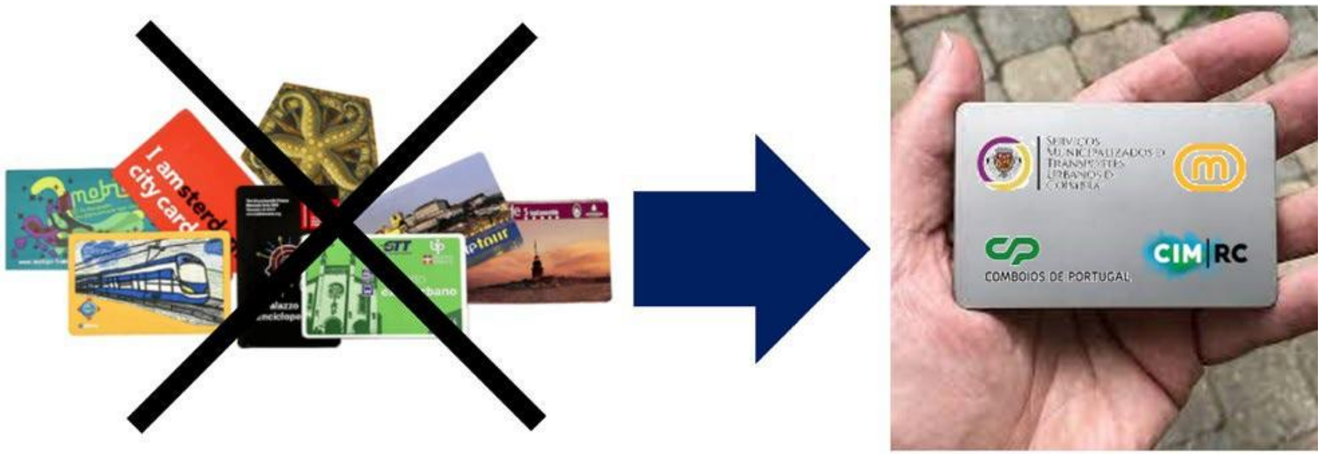
Concept

- BRT (Bus Rapid Transit)/BHLS
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- Stations
- High Frequency
- **Integration with other modes**

Physical Integration at Main Hospital

Concept

- BRT (Bus Rapid Transit)/BHLS
- 2 lines
- 42 km and 42 stations
- Dedicated Lane
- Electric Articulated Buses
- Stations
- High Frequency
- **Integration with other modes**



Ticketing and Tarif Integration

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

- Commercial speed
- Frequency and reliability
- Operation safety
- Passenger comfort
- Performance, capacity and productivity

Main Options

Electric Vehicles

- Reduce ecological footprint
- Reduce vibration and noise
- Image of modernity

Main Options

Opportunity Charging Stations

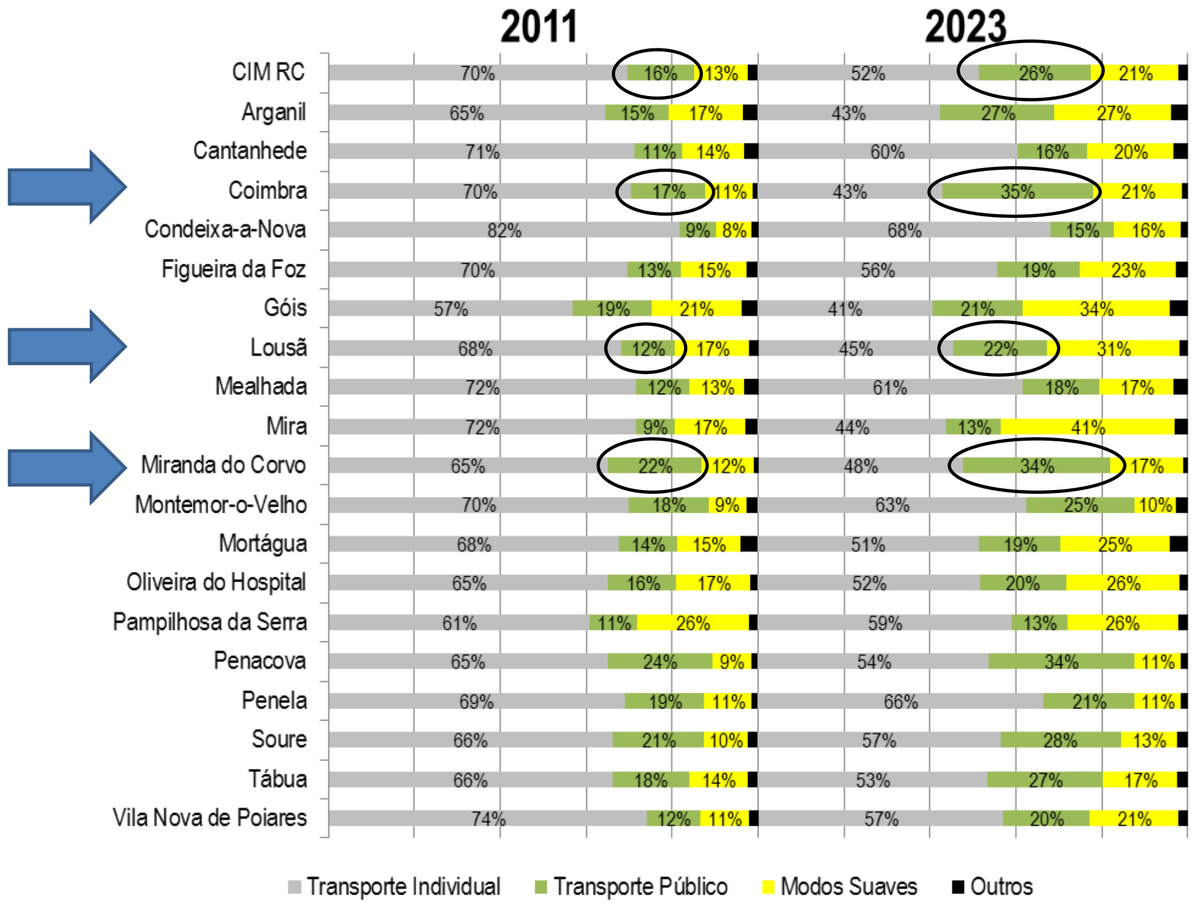
(only at the end of services)

- Significant distances (Coimbra B – Serpins ≈ 40 km)
- Avoid reduction on passenger capacity of vehicles
- Less kilometres of non-commercial services
- Charging during support periods
- Increase the resilience of the system

Expected Results

Global Demand : **13 M passengers / year**
(≈ 45 K passengers / day; ≈ 5 K passengers / rush hour)

GEG Reduction - **18 907 ton CO_2eq / year**

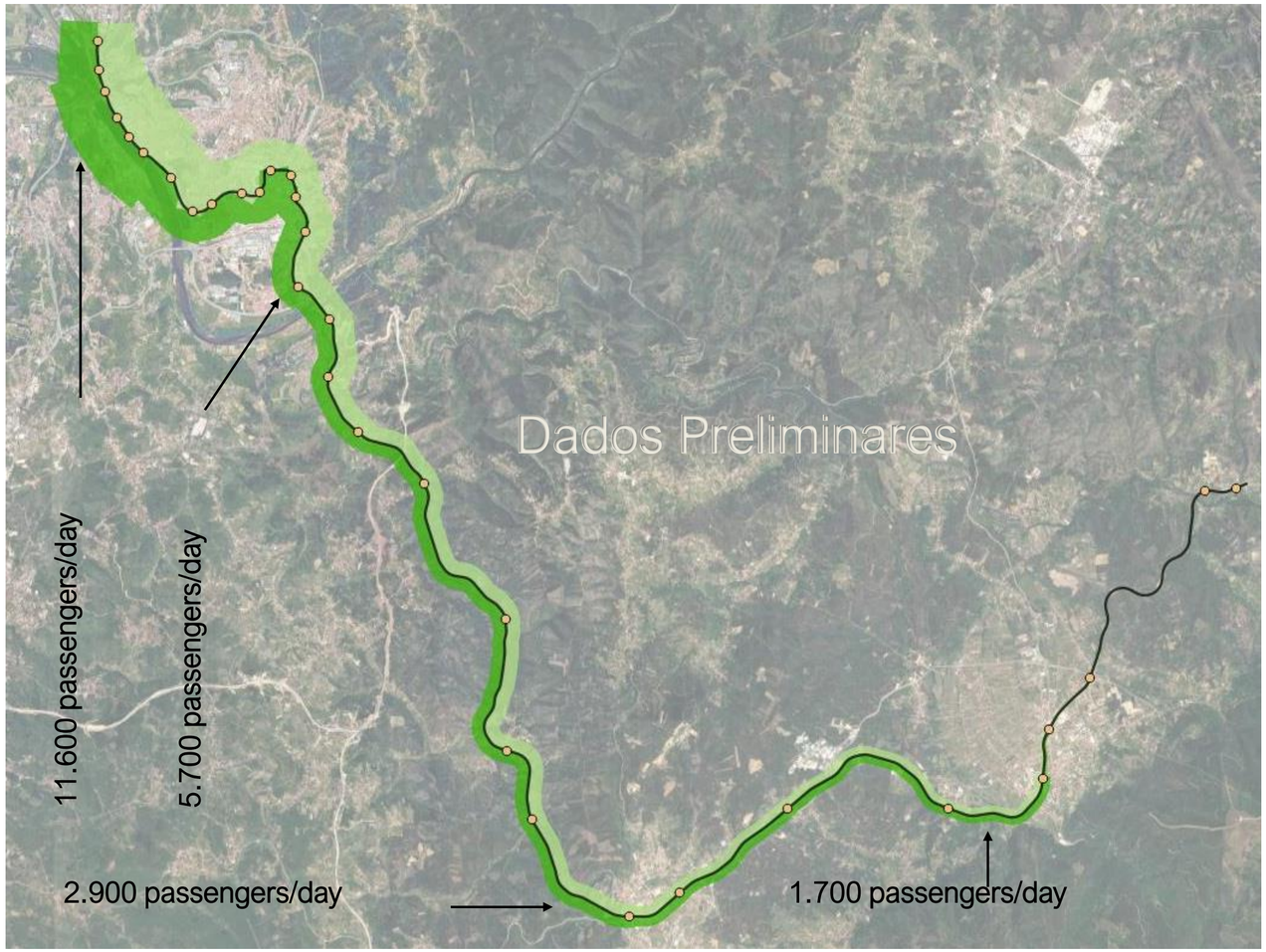


Source: PAMUS

Expected Results

Estimated Demand

(Passengers / workday / direction)



Expected Results

Estimated Demand

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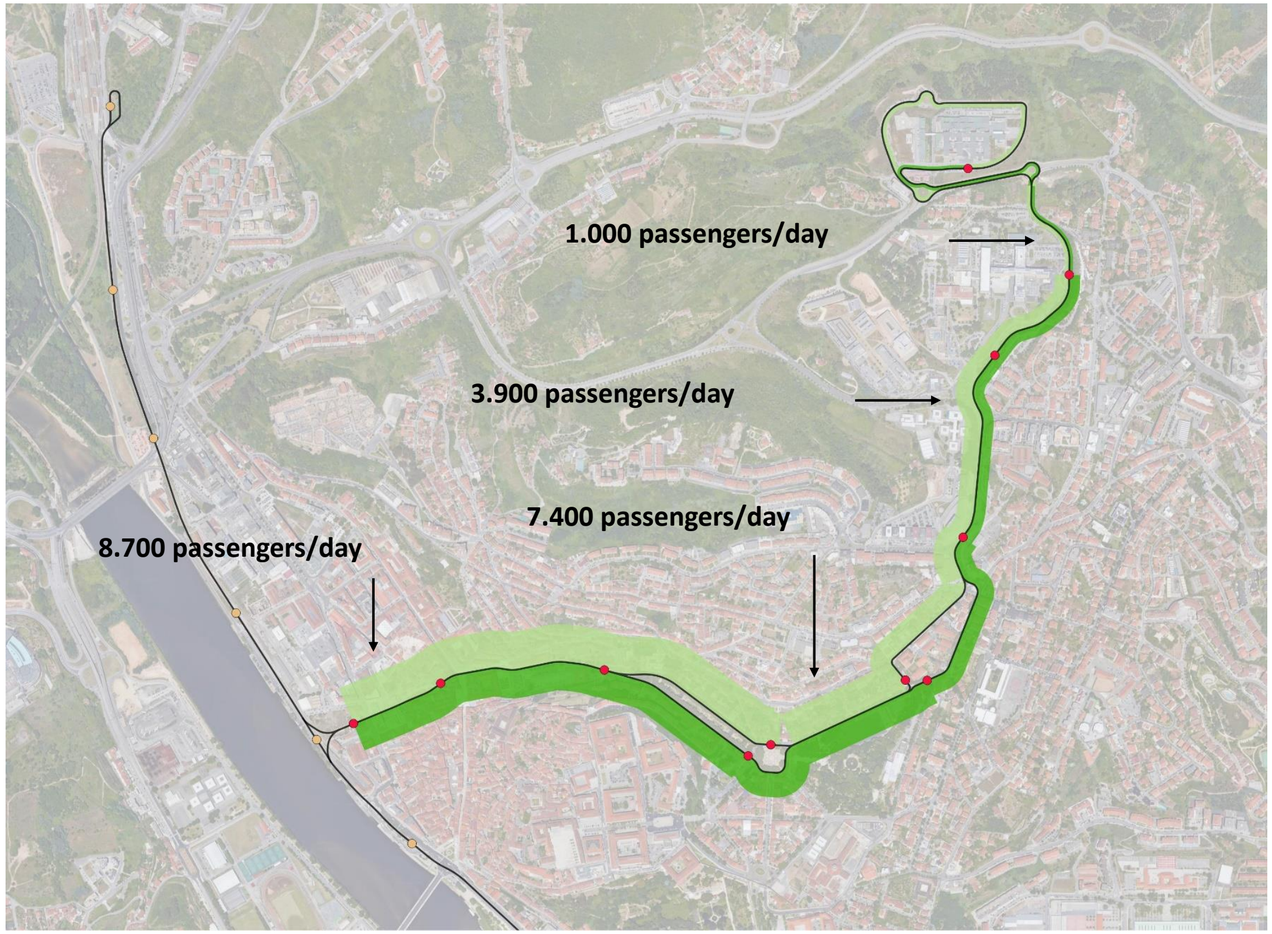
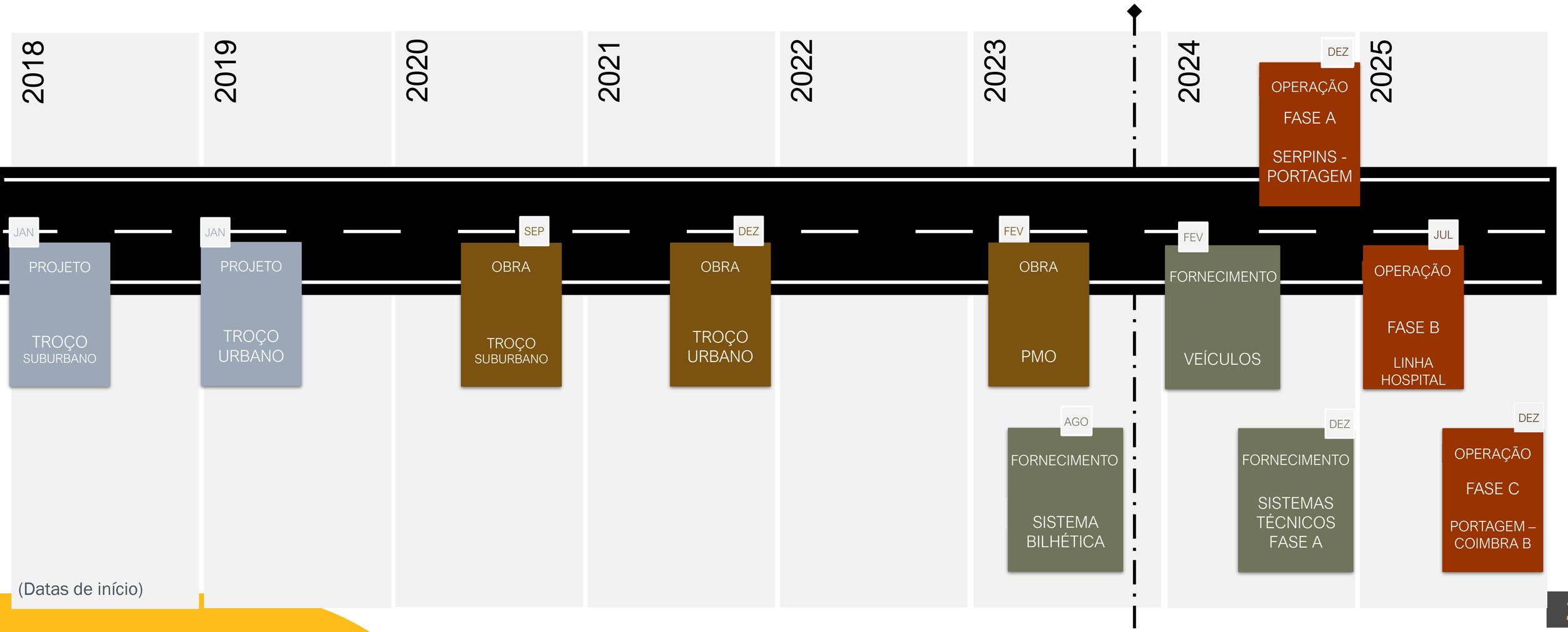


Present Situation

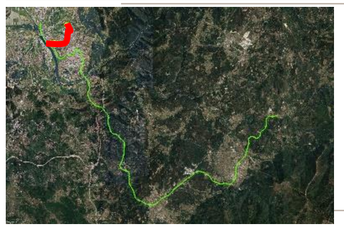


(Datas de início)

Present Situation

Suburban Section **Serpins - Alto S. João:** Started September 2020
Concluded – II Q 2024

Section **Alto de S. João – Portagem:** Started November 2021
Concluded – III Q 2024



Hospital Line: Started July 2022
Concluded – II Q 2025

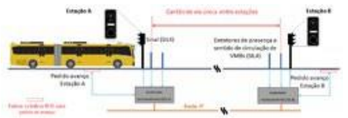
Section **Portagem – Coimbra B**: Started September 2022
Concluded –IV Q 2025

Present Situation

Ticketing System Supply: Started June 2022
Concluded – III Q 2023

Shelters: Started September 2022
Concluded – I Q 2024

Downtown Urban Intervention: Started September 2020
Concluded – II Q 2024



Technical Systems: Started March 2023
Concluded – IV Q 2024

Present Situation

Power Stations: Started – February 2023
Concluded – IV Q 2023

Vehicles Supply: Started – November 2022
Supply – II Q 2024

Depot: Started – February 2023
Concluded – II Q 2024

Depot Complementary Works: Start – December 2023
Concluded – II Q 2024

Communication Plan

Communication Actions

Previous initiatives


Concerto Obra da Baixa – 2022


Concerto Luz ao Fundo do Túnel - 2023


Semana Europeia da Mobilidade - 2023

Envisaged campaigns

e. g.

- Arrival of the buses
- Start of service
- European Mobility Week

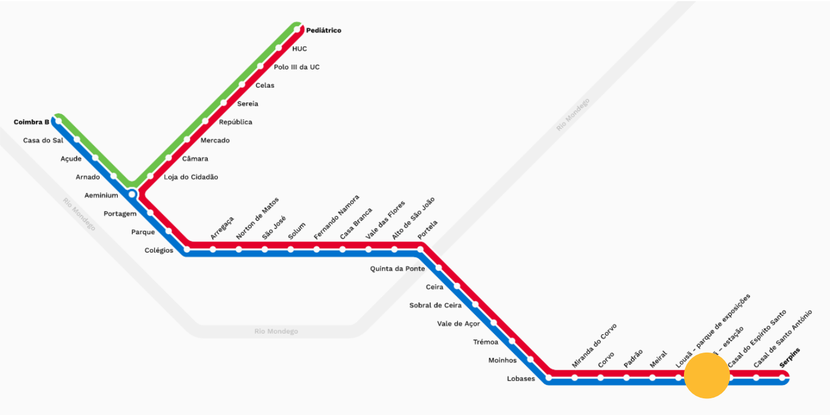
Communication Plan

Delimitation of work spaces

Outdoors

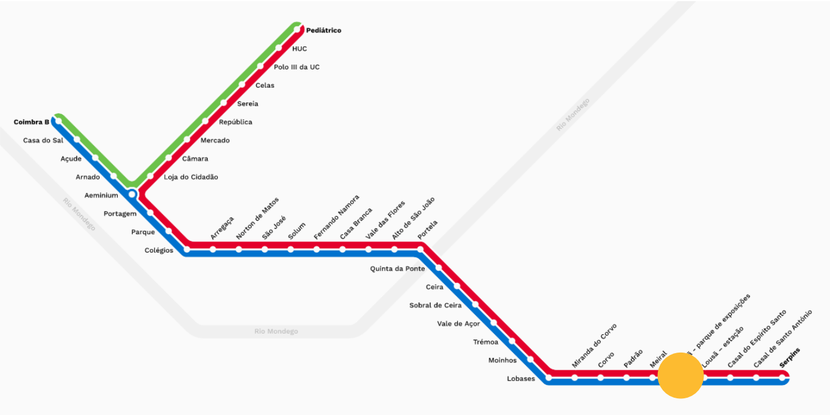
Public Awareness actions

Images



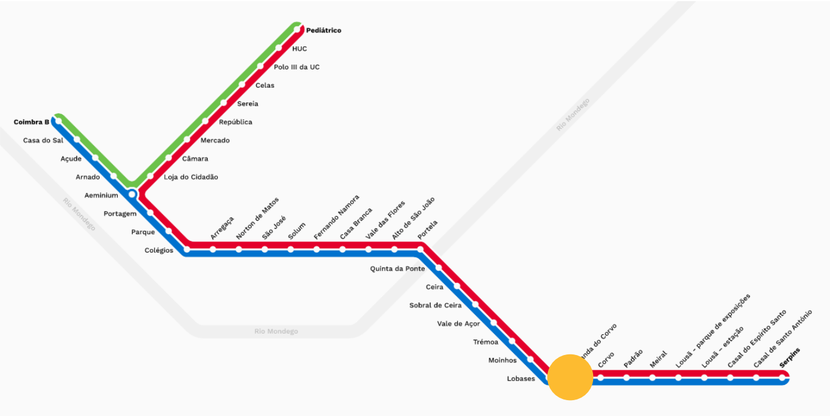
Lousã

Images



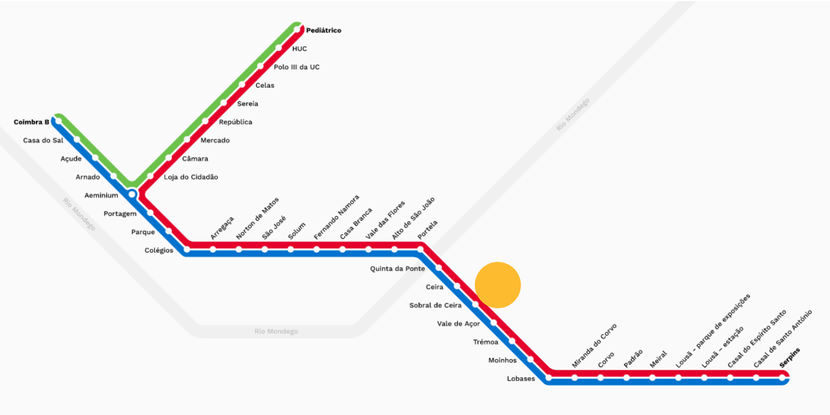
Lousã

Images



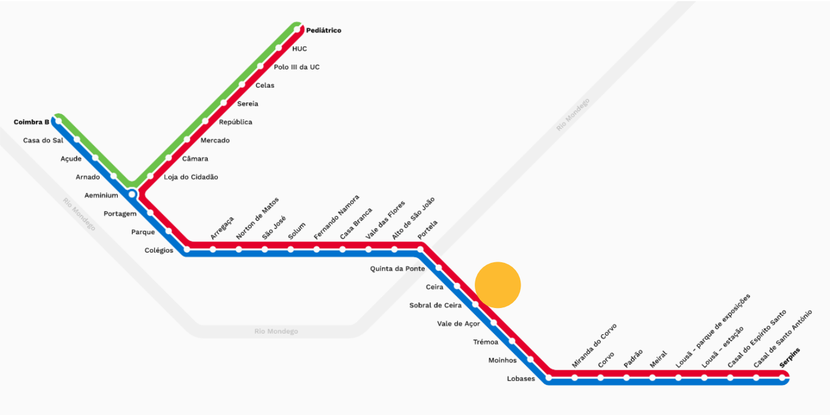
Miranda do Corvo

Images



Depot

Images



Depot

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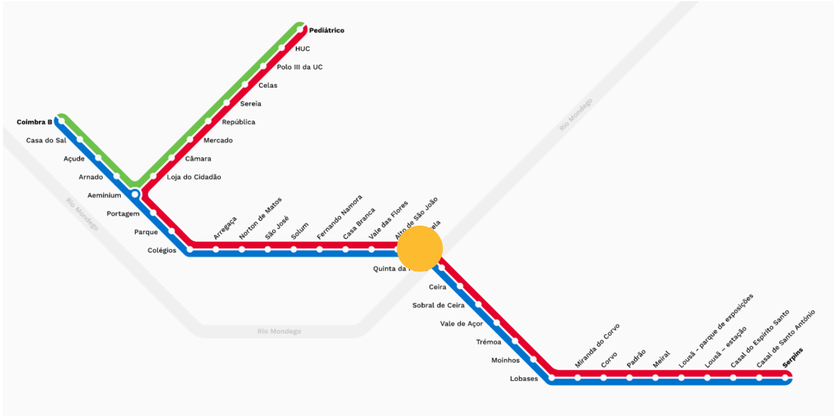
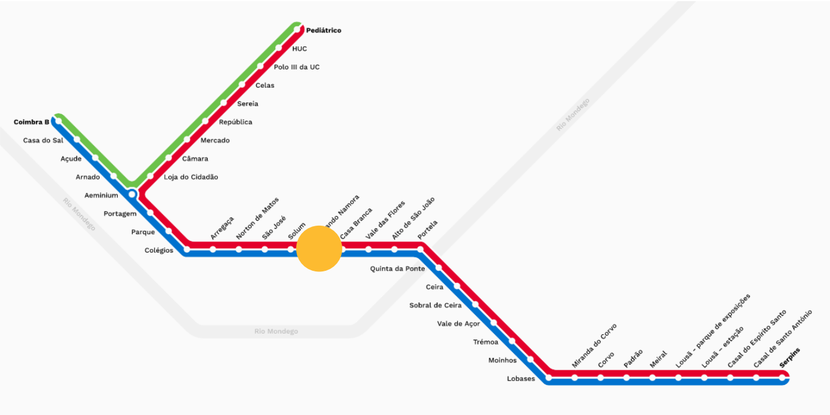


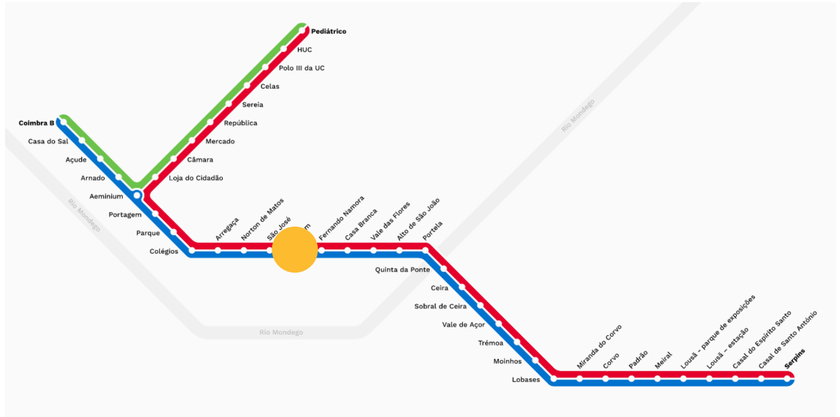
Portela

Images



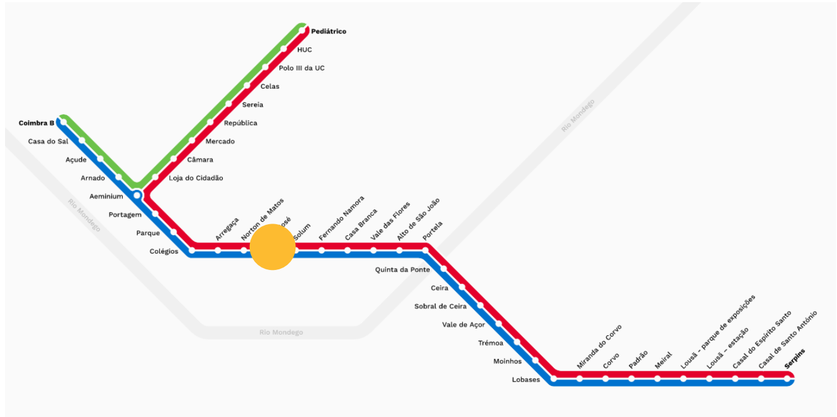
Fernando Namora

Images



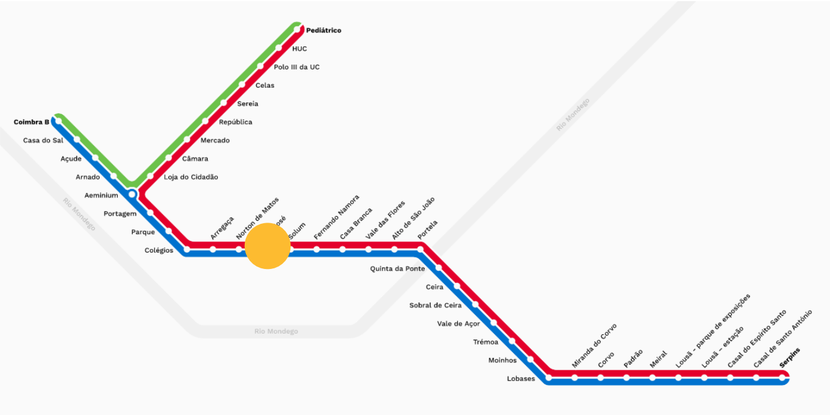
Solum

Images



D. João III Street

Images



D. João III Street

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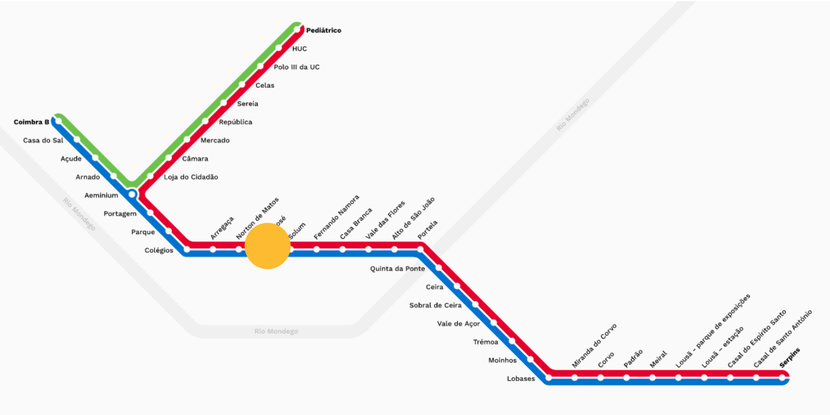
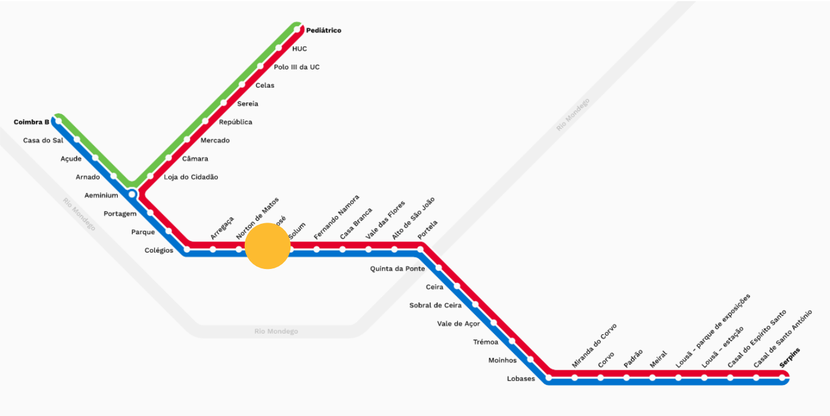


25 de Abril Square

Images



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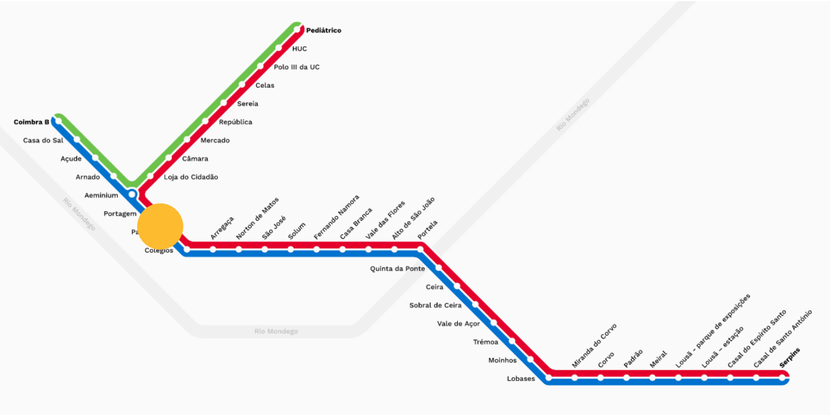
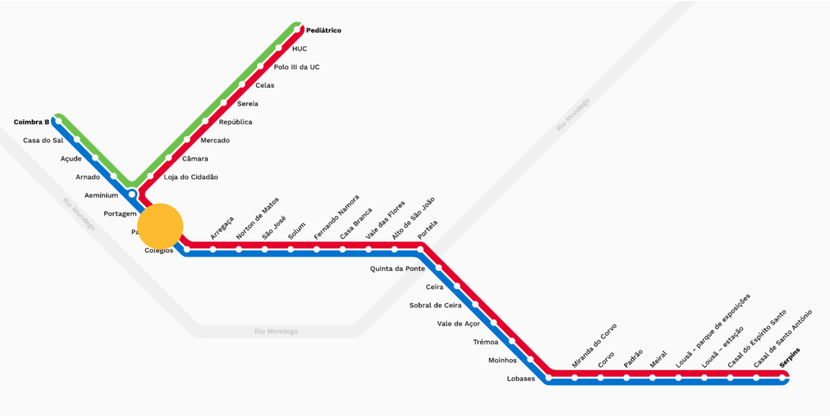


Estação do Parque

Images



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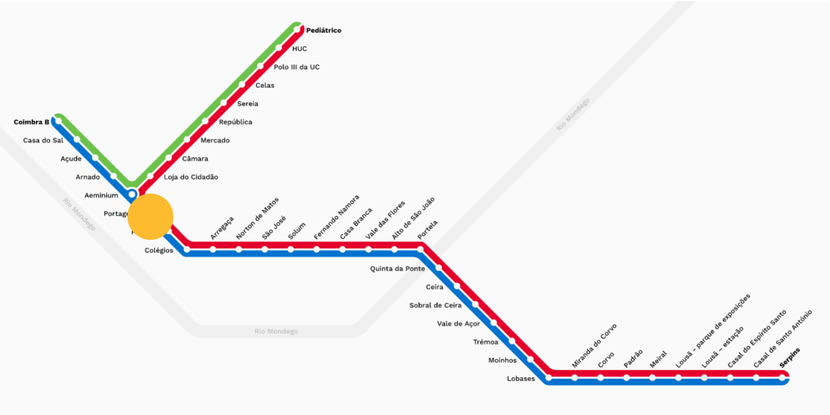
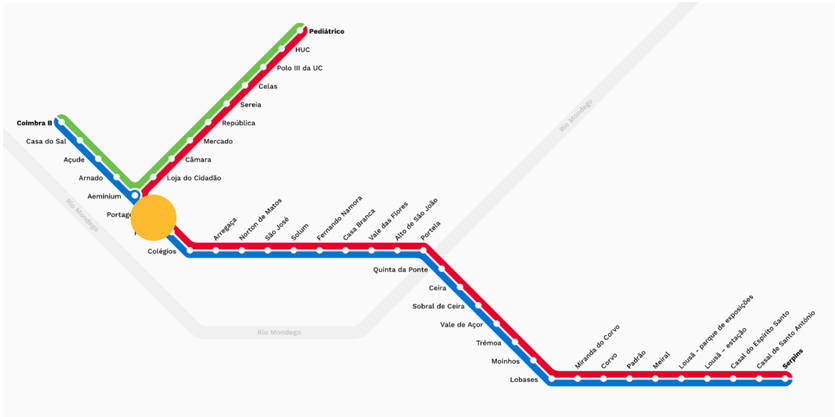


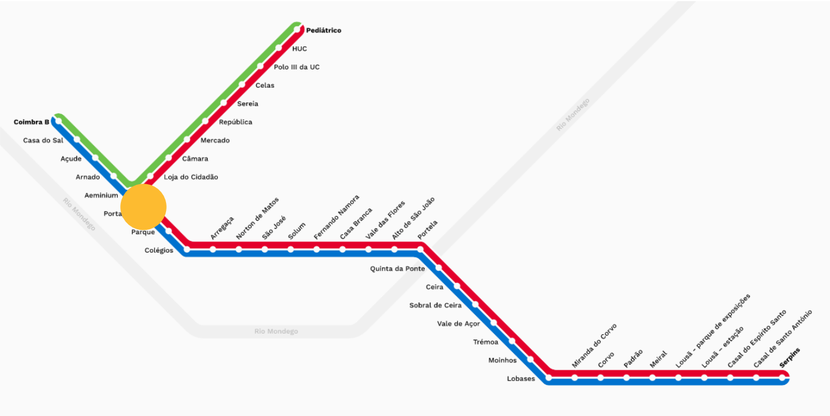
Emídio Navarro Avenue

Images



Portagem Square

Images



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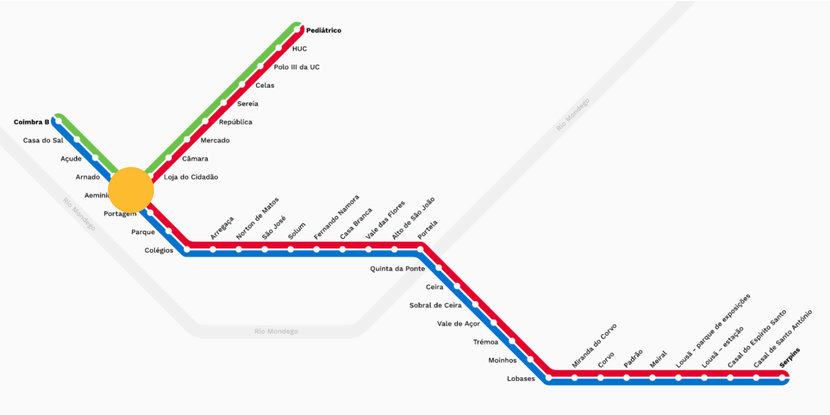
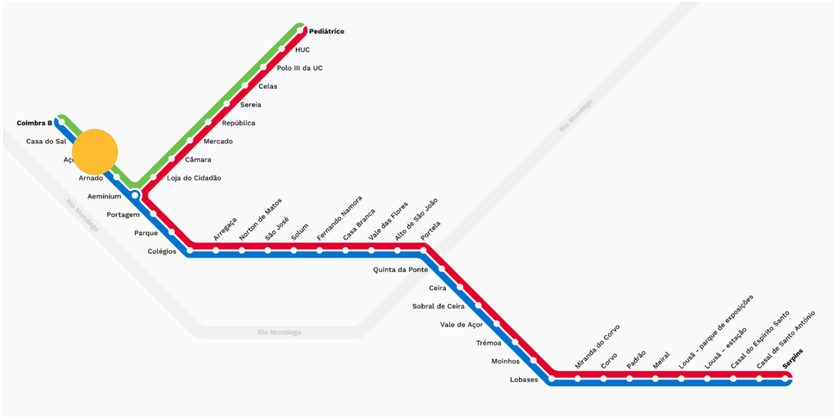


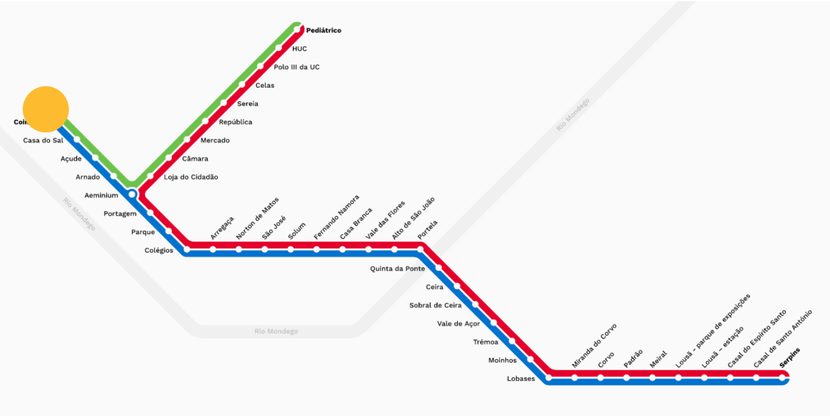
Aeminium Avenue

Images



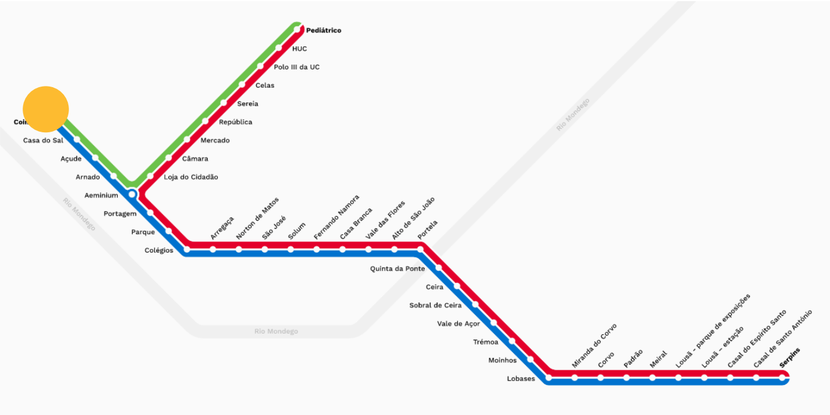
Açude

Images



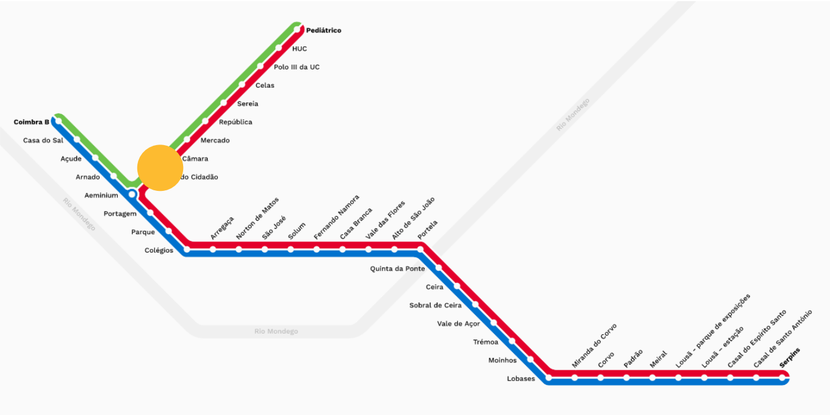
Coimbra B Station

Images



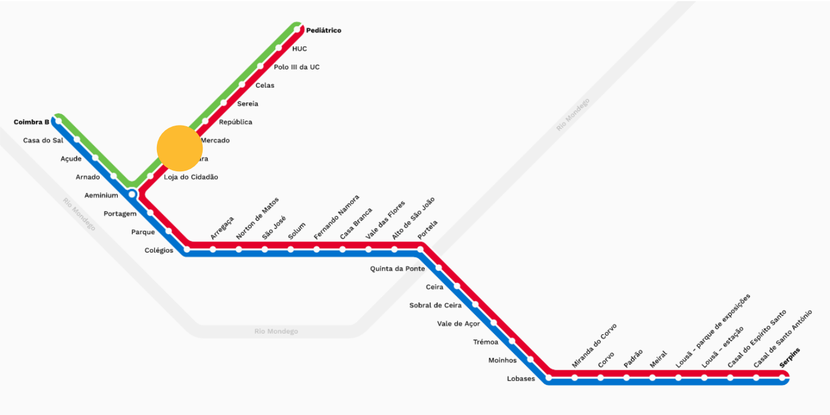
Coimbra B Station

Images



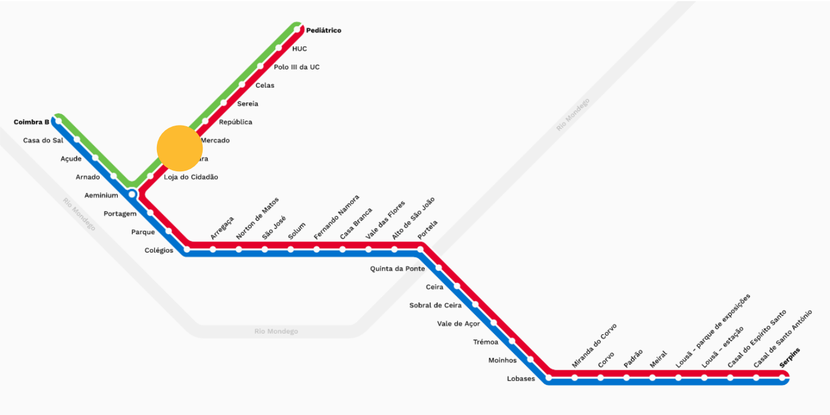
Loja do Cidadão

Images



Via Central Buildings

Images



Via Central Buildings

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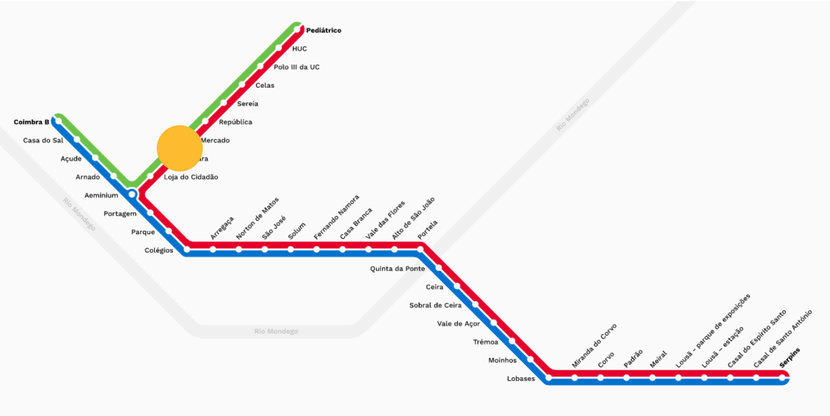
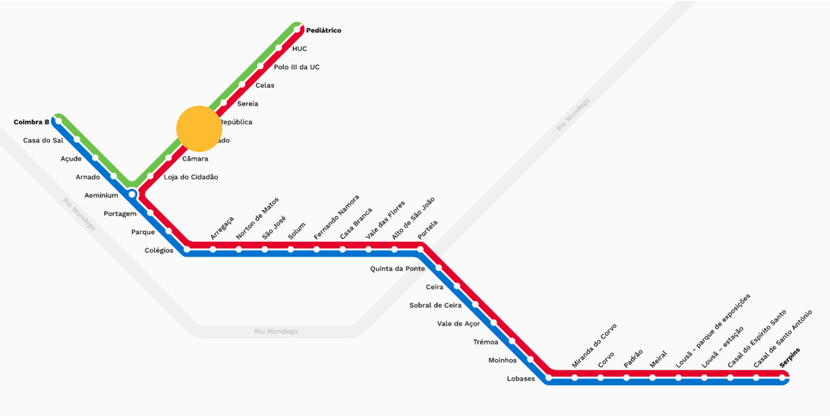


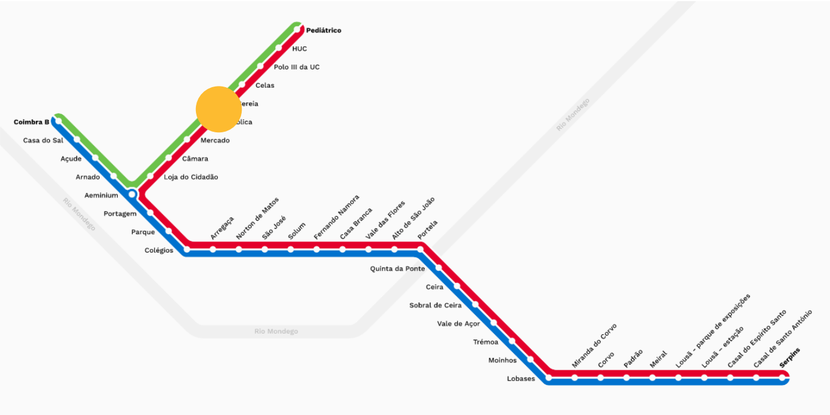
Via Central Buildings

Images



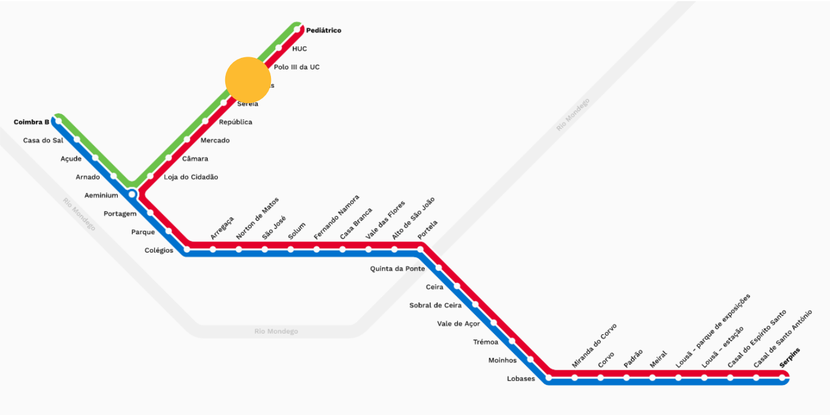
Market

Images



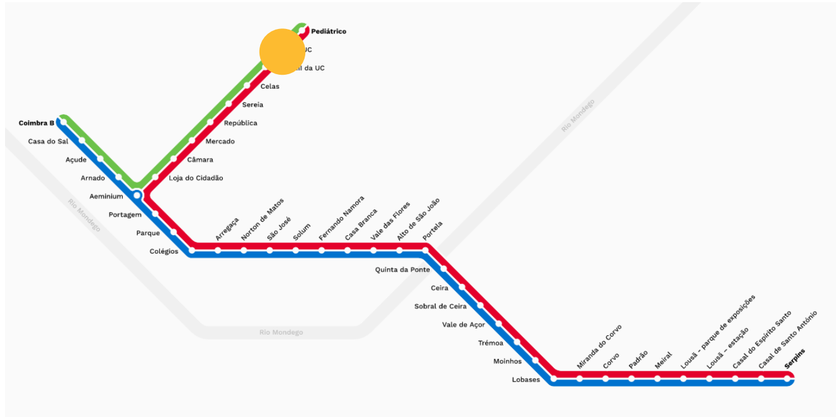
República Square

Images



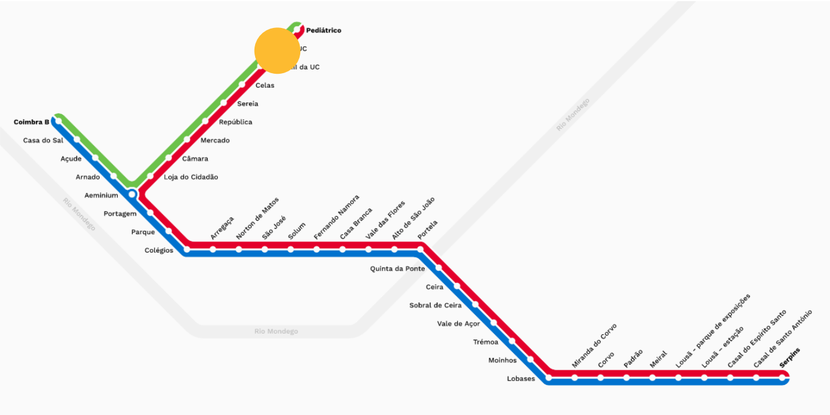
Celas

Images



Hospital

Images



Hospital

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