

Public Transport Towards a 2030 Zero Emissions Target

MIGUEL ÁNGEL ANÍA
Senior Technical Advisor of the Zaragoza City Council



A NEW PUBLIC TRANSPORT FOR THE 21ST CENTURY



Zaragoza
AYUNTAMIENTO



**Ingenieros
Industriales**
Aragón y La Rioja

In 2004, the Mayor of Zaragoza asked experts to advise the local government on investments in infrastructure and equipment in order to provide the city with the public transport for the 21st century.

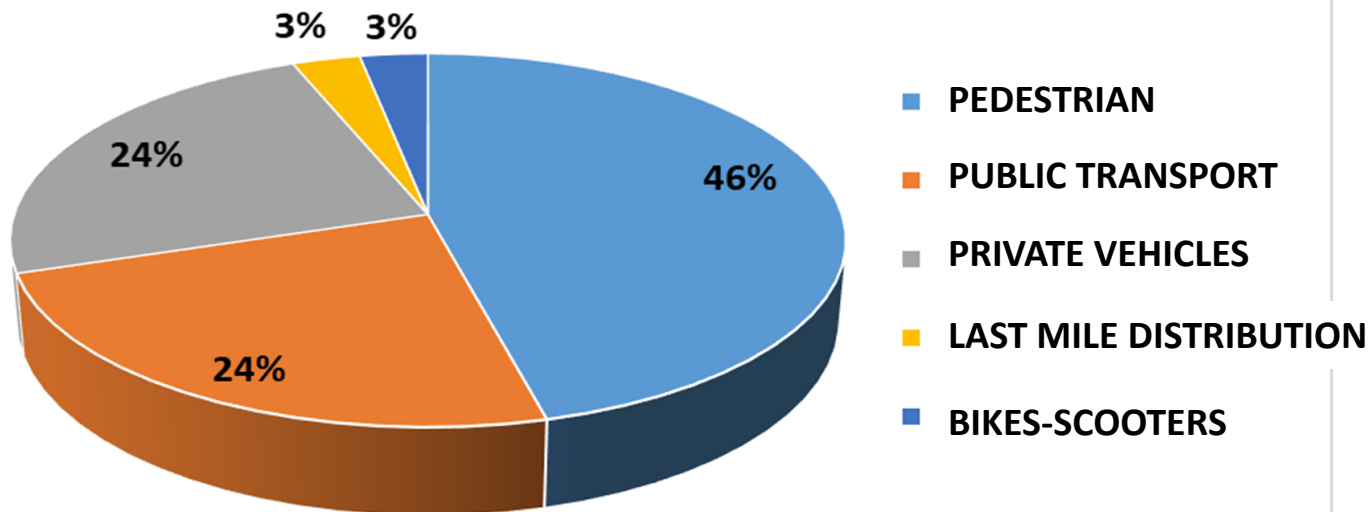
The investigation carried out by the experts pointed towards hydrogen buses and a new network layout, but using this technology on a large scale was impossible at that time .

The municipal government decided to invest in a new tram that is currently an international benchmark for its technology and the number of its users.



PUBLIC TRANSPORT ACCOUNTS FOR 24% OF MOVEMENTS

MODAL DISTRIBUTION IN ZARAGOZA



These figures look good... however, is it enough?

SUSTAINABLE, POLLUTION FREE MOBILITY

“The evolution of the different pollutants last year was once more favourable, maintaining the trend of previous years of registering average values, annually, daily or hourly — depending on the pollutant — below the limit values of the legislation.”

2021 AIR QUALITY REPORT



Although between 2013 and 2022 Zaragoza reduced emissions considerably, in order to reach the goal of zero emissions in 2030 it is necessary to improve sustainable mobility drastically (mobility still contributes to 25% of emissions).

Without a comprehensive plan to benefit the population both in terms of mobility and climate change, the zero emission goals risks being delayed.

EXPECTATIONS FOR PUBLIC TRANSPORT

A great deal of attention is focused on technology, but will technology be sufficient to reduce 100% emissions in the coming decade?



During the 4 month lockdown due to the pandemic, only public buses and last-mile distribution vans moved around the city.

There were no private vehicles in the streets.

NO2 emissions were reduced by 50%

Below the level recommended by the WHO

REDUCTION OF GLOBAL EMISSIONS BY 50% IS POSSIBLE

ZARAGOZA. CITY OF TRAMS



The first line of electric trams started service on October 10th, 1902.

For almost 120 years, our trams were manufactured exclusively in Zaragoza, in what is now CAF



Trams continued to operate until 23rd January 1976, with line 11 being the last tram line in service in Spain.



WAS TRAMWAY THE BEST SOLUTION?



Since the new tram started to operate again in 2013, road traffic has been reduced by 15% in Zaragoza, even exceeding 40% in some parts of the city center

23% of Public Transport users get the tram (29 million in 2019)

More than 200 cities from more than 60 different countries have visited our tram, as it is a world reference

The user rating is very positive: 8.5 points/10

However, it poses two very serious problems:

- 1.- It was very expensive and it is not economically viable, as it loses 5 million€/year
- 2.- The substitution of bus lines to provide space for the tram has generated a public transport scar that divides the city, as bus lines disappeared from the tram route.

The result is that public transport users fell by 11%, from 121 million in 2009 (start of tram works) to 108 million in 2016 (3 years after full operation) → A new network system is needed

SUSTAINABLE PUBLIC TRANSPORT. BUSES



4 electric buses in service since 2019. We have tested:

- 15 different electric models
- 1 Fuel Cell Hydrogen



All new Public Transport buses will be 0 emissions:
electric or hydrogen

With a 100% 0 emissions bus fleet we
will save 621,000 tn of CO₂



The electrification of buses also means economic saving

NEW CONCEPT FOR PUBLIC TRANSPORT. BUSES

Technology that seemed impossible 15 years ago has evolved, resulting in electric buses that meet the requirements for almost the 70% of the services with a single night charge in the garages.

Zaragoza is launching in 2022 a new fleet of 72 new buses, making it the largest project in Europe for the electrification of urban bus fleets. (1 in every 5 buses)

We are going to renew 35 buses per year using 0 emissions Spanish technology.

New installations for the electricity supply with 20 MW of power

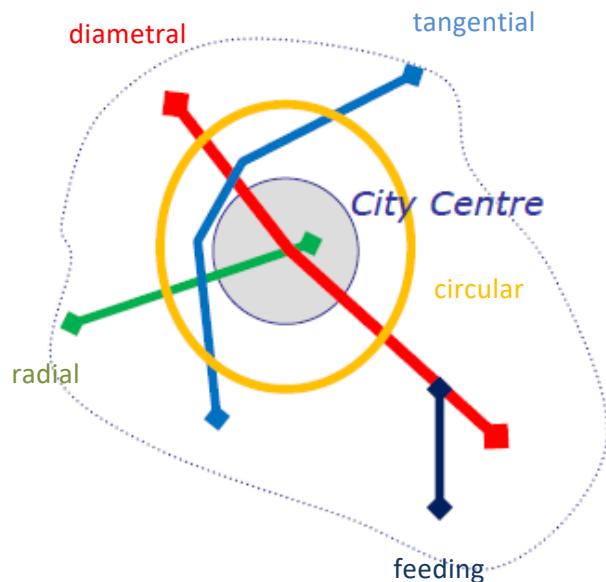


Green Hydrogen technologies will complete the 30% of the services that cannot be attended by buses that run only on batteries

0 EMISSIONS BUSES COST LESS

NEW CONCEPT FOR PUBLIC TRANSPORT.NETWORK

...But it is not enough to transform the fleet, we need to attract more users



A combination of types of lines to offer the best service to users



With a maximum of 2 transfers you can reach any destination

In most of the cases with 1 transfer will be enough to go from any point to any other point

NEW CONCEPT FOR PUBLIC TRANSPORT.EXAMPLES

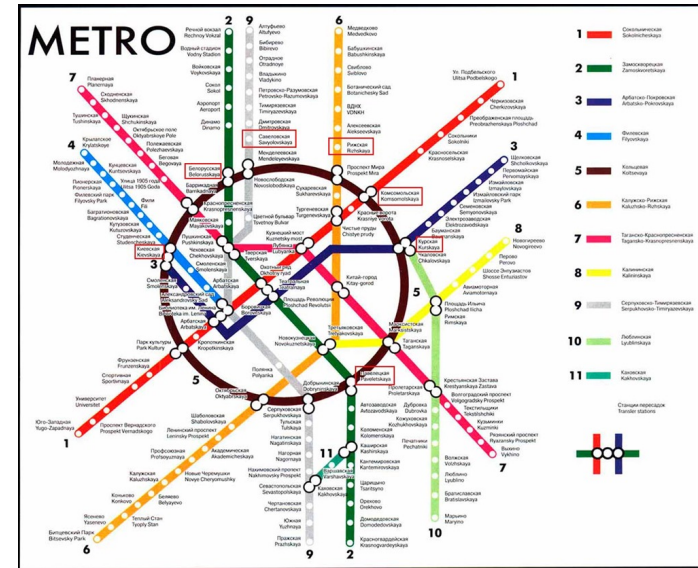


BARCELONA: NEW BUS NETWORK

Orthogonal network with vertical, horizontal and diagonal lines following the main streets of the city.
Direct and straight lines. Multiple nodes.

MOSCOW: UNDERGROUND

Simple network combining diametrical lines with a single circular line



NEW CONCEPT FOR PUBLIC TRANSPORT. PROJECT

OBJECTIVES OF THE NEW BUS NETWORK REPRESENT AN AMBITIOUS CHALLENGE

- Increase commercial speed by 20%
- Reduce travel times by 20%
- Maintain intervals of 5 min throughout the network
- Have a bus stop at less than 300 meters for 98% of citizens
- Increase the number of users of Public Transport by 20%
- Reduce the use of private vehicles by 30%
- 2 transfers maximum
- Integrate the tramway line in the network
- Any place could be reached in 15 min



SAFETY WITH INTERNATIONAL RECOGNITION



Bus Public Transport Operator obtains the AENOR certificate for the protocol against the COVID-19.

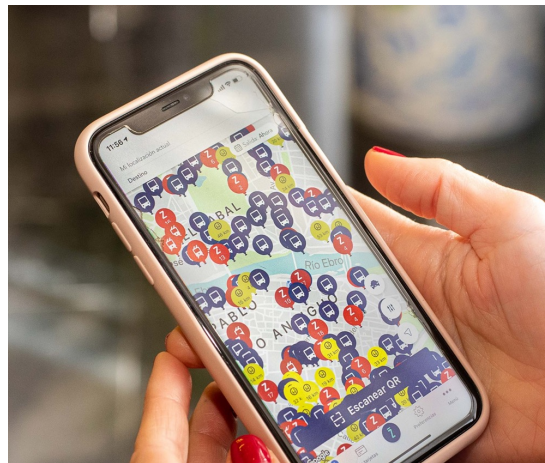


The Zaragoza Tramway wins the award for the Best Safety Initiative in London at the Global Light Rail Awards 2021

MORE...NEW SUSTAINABLE MOBILITY PLAN



NEW TRAFFIC CONTROL CENTER



NEW MaaS App



NEW App for the visually impaired

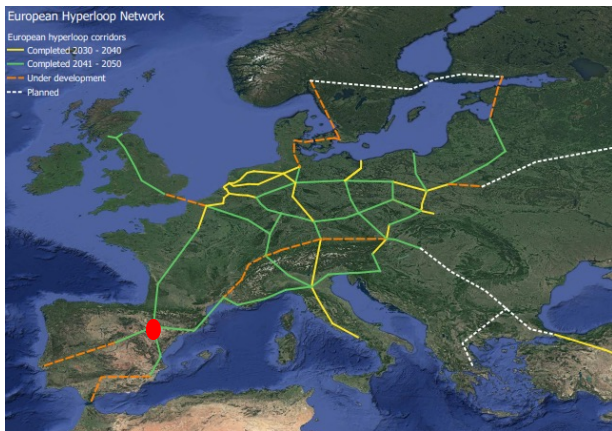
NEW network with
more than 200
charging points



100% of the streets
have either lanes with
speed limited to 30
km/h or bike lanes
(bike traffic increased
by 80% in 2 years)



Autonomous last mile distribution Project



17 has. of exclusive zone for trials in Urban Air Mobility
Zaragoza is participating in European projects for UAM

Zaragoza will be one of the main nodes of the European Hyperloop Network

CITY OF INNOVATION IN ADVANCED MOBILITY

AND...WE COMPENSATE THE EMISSIONS

THE FOREST OF THE CITIZENS

700,000 trees (1 tree per citizen)

2,000,000 shrubs

1,200 hectares

Use of recycled organic waste

