



The Modern Tramway. Boosting Public Policies in the environment and air quality



Ricard Riol Jurado, president of PTP
Side Event.

The Modern Tramway. Boosting Public Policies in the environment and air quality

Welcome to Barcelona, the only city in Europe with a “Tram Interruptus”. Why?

1872-1971



2004-nowadays



We won't talk about a simply re-introduction of tramway in a city...

We will talk about a fight for public space with the last battle not still won, about the relation between population and their politicians and how associations and works together for improving the public transport.

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Welcome to Barcelona, one of busiest metropolitan area in Europe. Lots of cars and...

Real city: 3,5 Mio Inhab. // ~5.000 inhab/km² // 6.000 cars/km² city center

Car density
(cars per
km²)

Barcelona (ES)	6,000
London (UK)	1,500
Milano (IT)	4,200
València (ES)	1,600
Madrid (ES)	2,300

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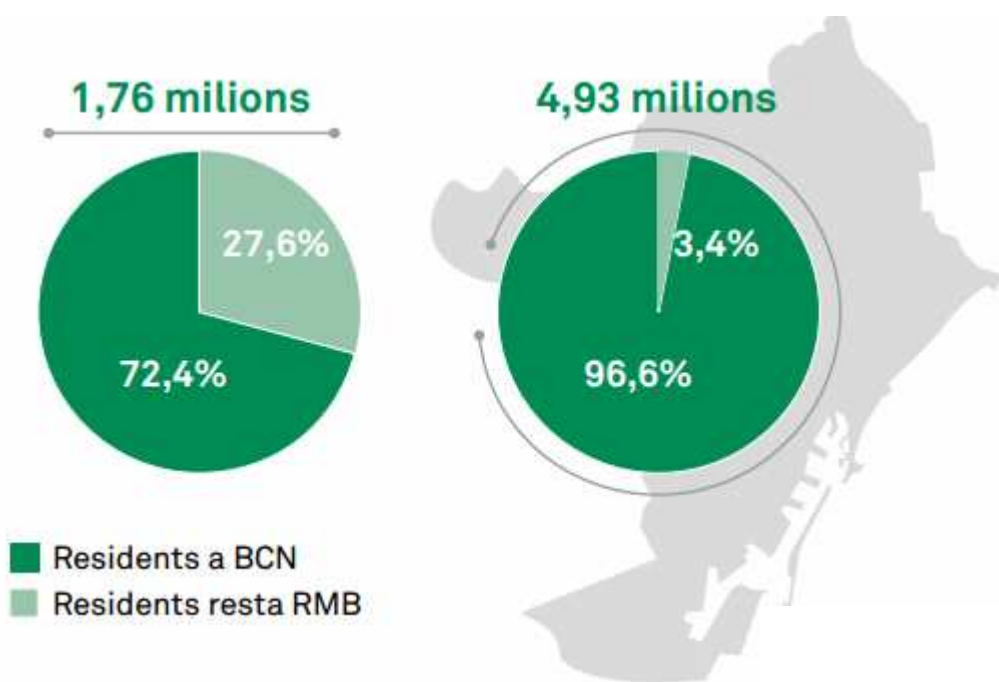
...lots of subway trains! (fortunately)



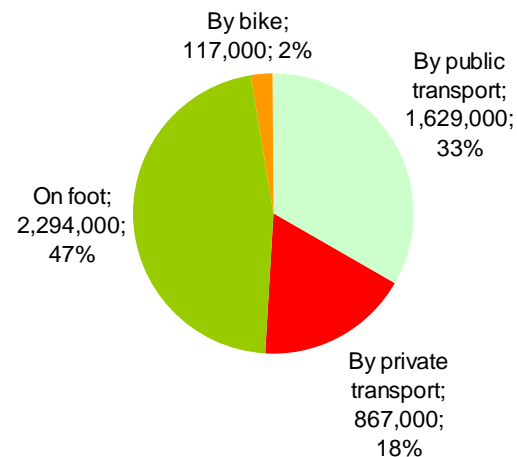
	Continuous urban area surface (km ²)	Continuous urban area population (inhabitants)	Density of population (Inhabitants per km ²)	Subway network (within continuous urban area, not mixed with traffic)	Km of Subway per 1,000,000 inhab.	Km of Subway per 1,000 km ²
Москва (Moscow) (RU)	1,081	10,452,000	9,669	292.9	28.0	271.0
Санкт-Петербург (Saint Petersburg) (RU)	606	4,662,547	7,694	110.2	23.6	181.8
Αθήνα (Athens) (GR)	418	3,103,000	7,428	65.6	21.1	156.9
İstanbul (Istambul) (TU)	1,831	11,372,613	6,211	43.473	3.8	23.7
Barcelona (ES)	636	3,150,380	4,955	166.7	52.9	262.1
París (FR)	2,723	9,928,000	3,646	214	21.6	78.6
Berlin (DE)	892	3,228,000	3,619	146	45.2	163.7
Milano (IT)	948	2,627,284	2,771	74.1	28.2	78.2
Madrid (ES)	1,936	4,990,000	2,578	284	56.9	146.7
Roma (IT)	1,285	2,654,187	2,066	39	14.7	30.4
Frankfurt am Main (DE)	1,554	2,260,000	1,454	58.4	25.8	37.6
London (UK)	8,940	8,278,251	926	400	48.3	44.7
Average	22,850	66,706,262	2,919	1,894	28.4	82.9

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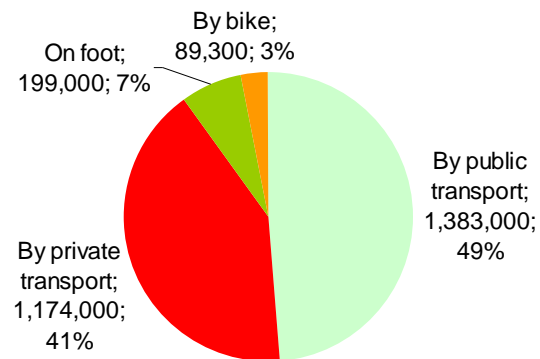
Good mobility, bad environment results



INTERNAL MOVEMENTS



CONNECTION MOVEMENTS



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The Barcelona's masterplan was thought for pedestrian, public transportation and cars

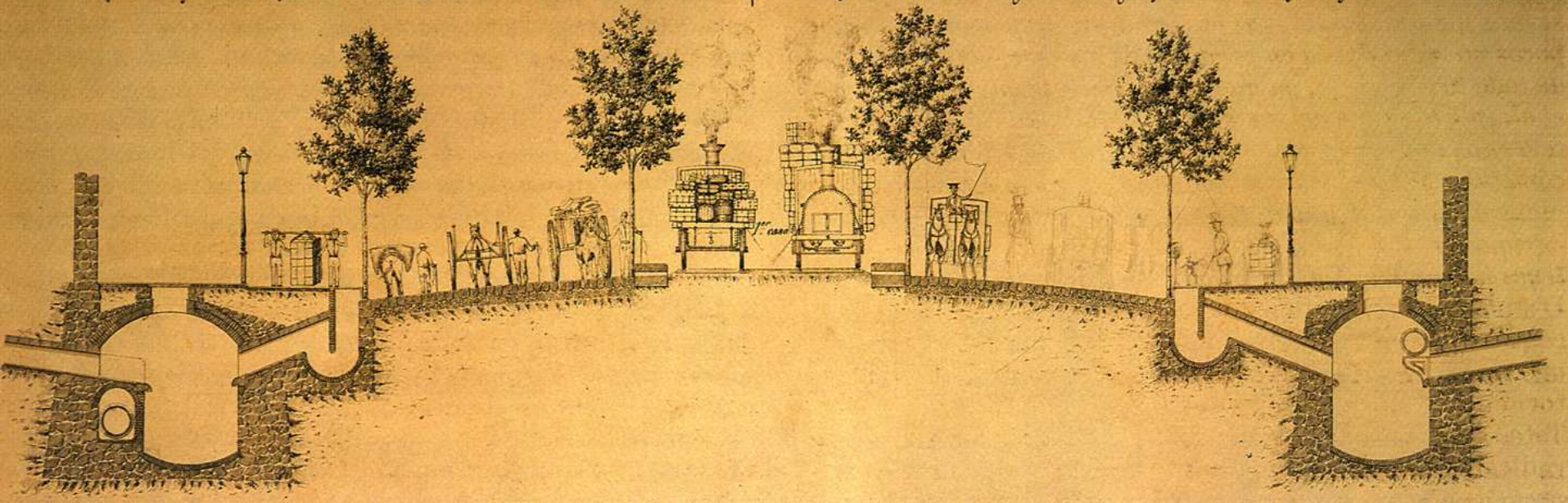
Ildefons Cerdà, engineer, developed the first scientific urban planning, integrating public spaces, transports and housing. "Eixample" plan was created in **1859**.



The Modern Tramway. Boosting Public Policies in the environment and air quality Barcelona integrated heavy rail and surface “domestic locomotives” long time ago

Perfiles del pavimento y obras subterráneas de las calles en el supuesto de que la exportación de las aguas se haga por las calles principales.

Llam.º XXXVI



In 1859, **Ildefons Cerdà** did not only define the new ways and houses.

- Defined the criteria: 50% for mobility, 50% for pedestrians
- Scientific proportions for streets and housing according to health criteria (water, air, light...)
- Minimum street width: 20 meters (the widest street in old city was 8 meters)
- Develop of “domestic locomotives” (name given by Cerdà) for public transport, before tramway was common in Europe in the center of the street, like the modern light rails.

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In Barcelona, mass media and dictatorship killed the tram in favor of cars.

1970



“¡Fortunately! The motorway from Barcelona to Mataró is a reality!”

1971



“Fortunately Barcelona is free of tramways”

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1971: Barcelona lost one of the most important tramway system in Europe...

Barcelona



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Petrol and car lobbies forced the bus instead the tramway... like other cities in the world

Los Ángeles



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New tramways appeared in 2004 in Barcelona, changing urban spaces.



2002



2004



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2002



2004



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New tramways appeared in 2004 in Barcelona, changing urban spaces.



2002

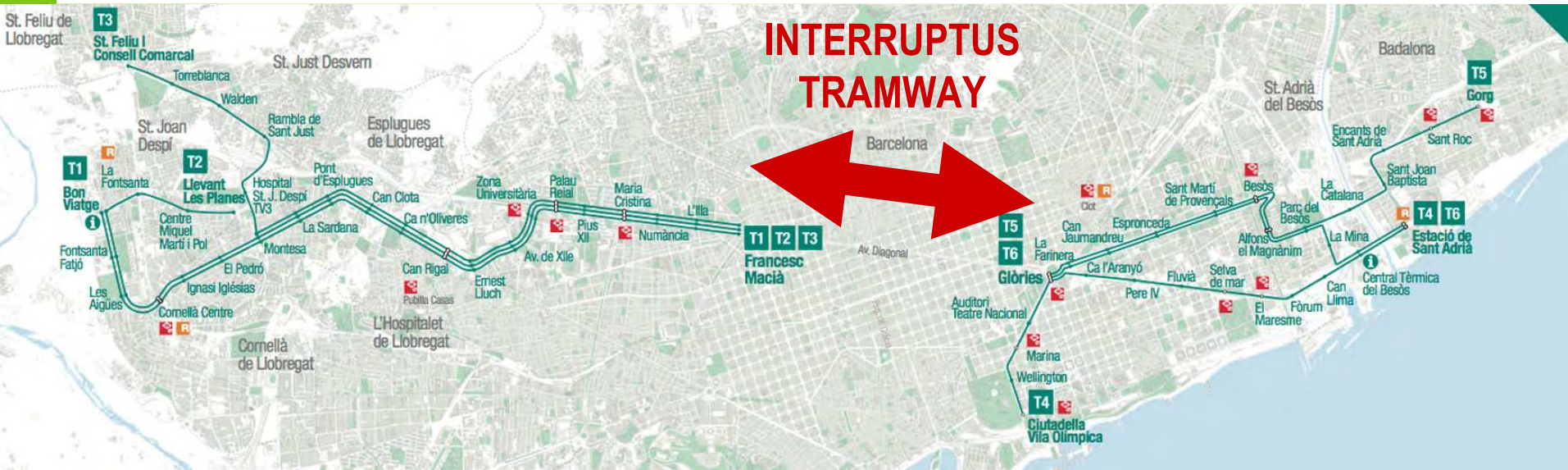


2004



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“Tram Interruptus” it’s a nonsense



Trambaix. 15.1 km 65,000 pax/day

3.9 km +110,000 pax/day

Trambesòs. 14.0 km 25,000 pax/day

Modern tramway along Diagonal was **planned in 1987-1997** and **approved in 2001** by Metropolitan Transit Authority. This tramway also serves the 8 metropolitan towns that originate the 50% of external traffic in BCN.

Several politicians forced to split the project in 3 sections. Only the two external parts, Trambaix and Trambesòs, were **inaugurated separately in 2004**. Central tram is still under political controversial, but with technical agreement.



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Nobody criticizes public transportation, but when Diagonal central tram is proposed...

Tram is old fashioned, we have electric buses!

This tramway won't be able to reduce traffic that comes from farer areas

If you eliminate private car lanes in Diagonal the rest of the city will collapse

Buses doesn't need rails and wires, are cheaper and more flexible

The best public transport is the subway, it doesn't disturb the traffic

We have an economical crisi, this project is not a priority

Tramway is too much rigid, you can't change its path.

People voted against tramways in a referendum in 2010

We can link the curent trams with buses

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The real problem



Diagonal: main av. Very symbolic. Too many cars, too many accidents, few public spaces.



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“Tram Interruptus” it’s a nonsense

2010-2015: More than **60 cities** have enlarged or created tramway networks in Europe.

In Barcelona some politicians use public transport innovations like the electric bus or the biarticulated bus against tramway in Barcelona.

But Diagonal avenue needs the capacity of a modern tramway system. The bus is the current system used in this area and it’s fully collapsed.



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Buses are good but...



400
PLACES
128 SEATS

1 double tram is
equals to 6 buses,
4 articulated buses
or 2'8 biarticulated

Only 40 places more
than an articulated bus.
Only 35% of double
tramway capacity

140
PLACES
40 SEATS

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Main avenue in Barcelona needs more capacity



Electric bus



solution?

BUS
DIAGONAL

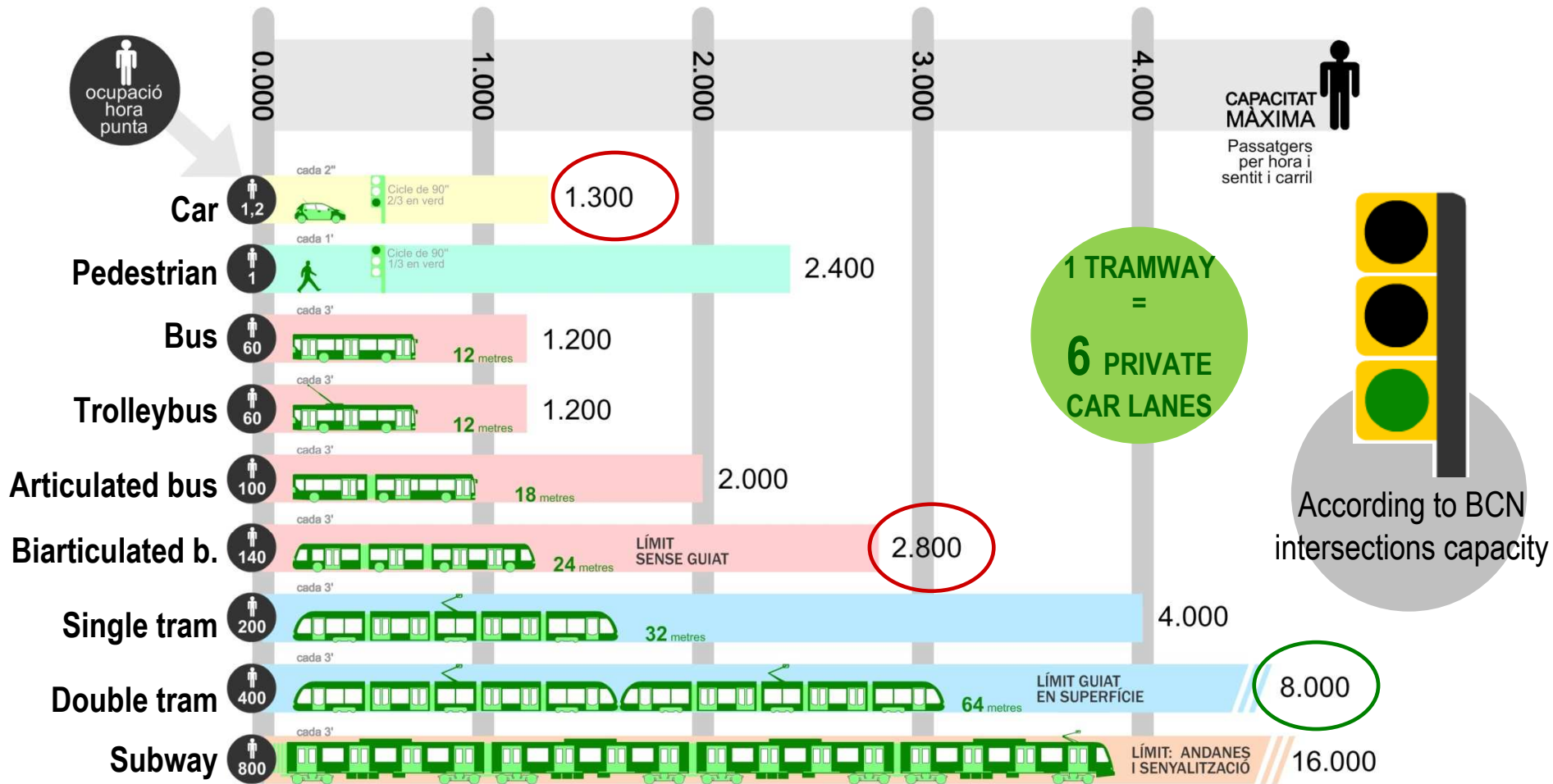
8km/h



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Main avenue in Barcelona needs more capacity

Hourly capacity per lane



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Tramway, more capacity to reach the demand of private cars



Bordeaux
90s

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Tramway, more capacity to reach the demand of private cars



Bordeaux
nowadays

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Tramway... an affordable investment



100 M€

infra

3,6 km with 7 stops

> 90.000 passengers per day on electric PT



100 M€



1 km with 1 stop

< 25.000 passengers per day on electric PT

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Tramway... an affordable investment

To spend more is not the best way to increase public transport users



Zaragoza tramway

Sevilla Metro

Málaga Metro

Investment: 355 M€

Investment: 658 M€

Investment: 762 M€

Length: 12,5 km

Length: 18,5 km

Length: 12,0 km

Underground: 0%

Underground: 50%

Underground: 80%

Year demand 2013:
30 Mio. passengers

Year demand 2013:
15 Mio. passengers

Expected year demand:
12 Mio. passengers

11,8 € / pax

43,9 € / pax

63,5 € / pax

Source: Promoció del Transport Públic

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Tramway... old fashioned?

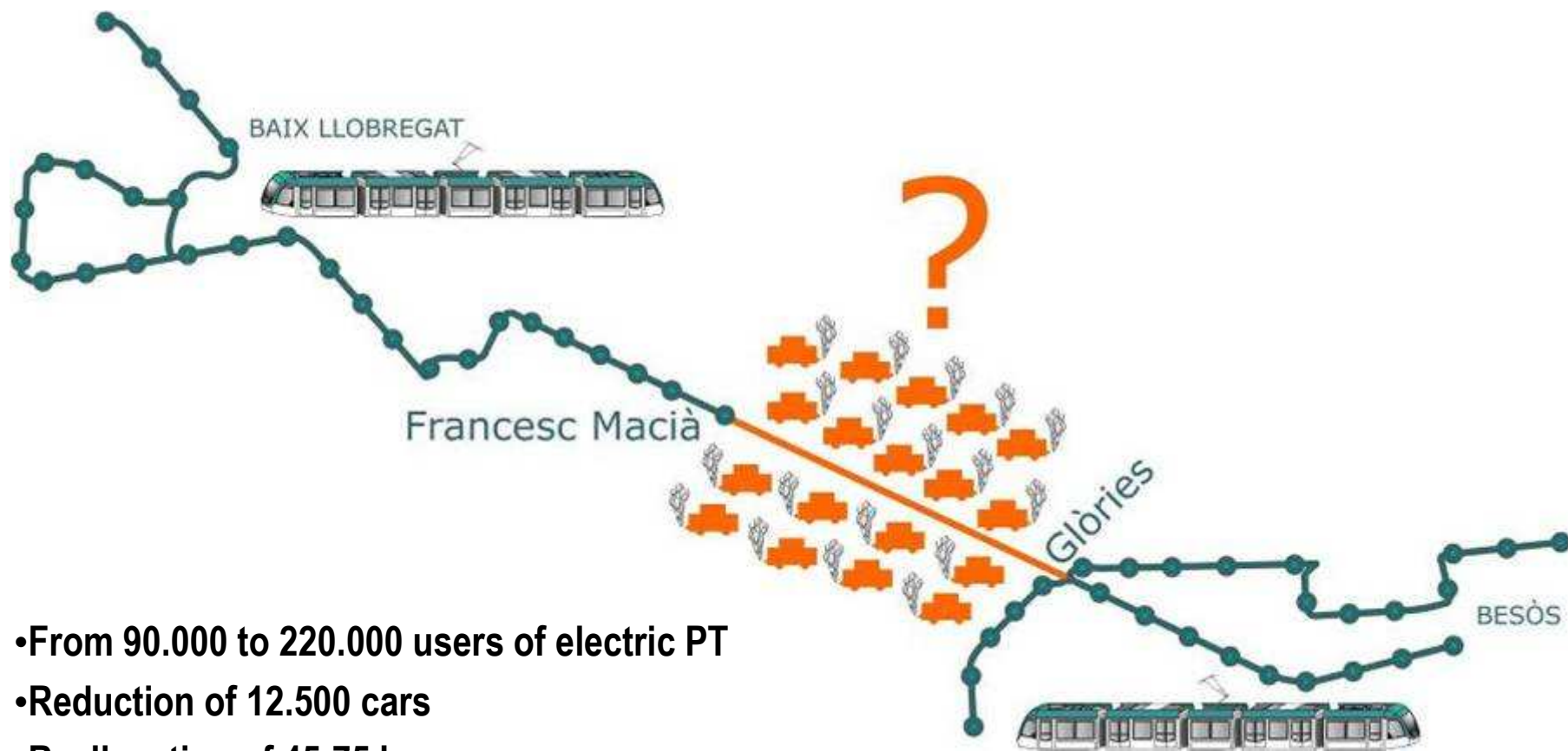


The Modern Tramway. Boosting Public Policies in the environment and air quality Tramway... old fashioned?



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So... the only affordable solution to give capacity and to earn public space is reducing cars



- From 90.000 to 220.000 users of electric PT
- Reduction of 12.500 cars
- Reallocation of 45-75 buses
- Recution of pollution, stress and accidents

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Health, public transportation and public spaces



HEILDELBURG (150.000 inhab)
UNESCO
13 $\mu\text{g}/\text{m}^3$



The Modern Tramway. Boosting Public Policies in the environment and air quality

Health, public transportation and public spaces



FREIBURG (220.000 inhab.)
Eco-capital of Germany
11 $\mu\text{g}/\text{m}^3$



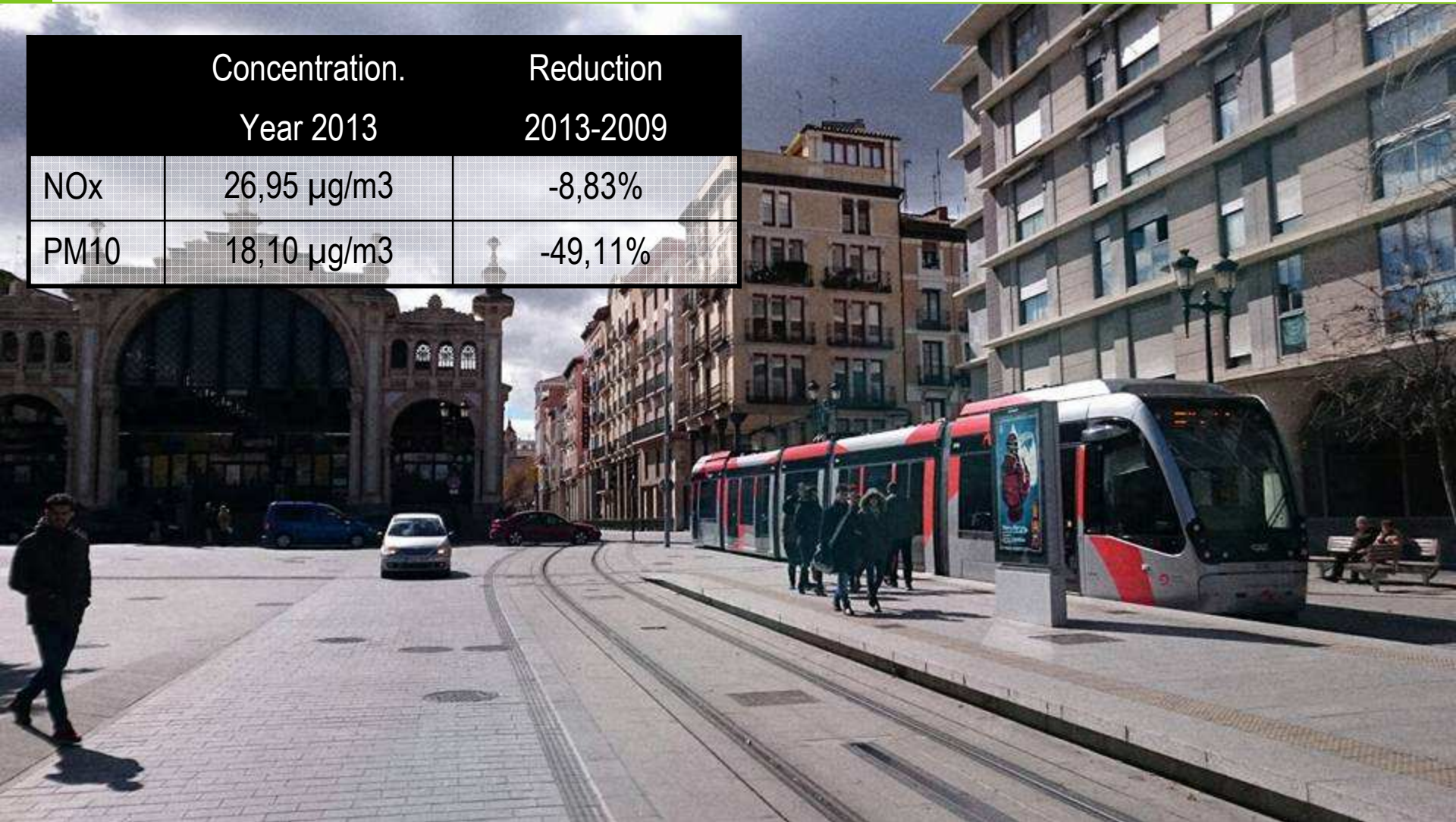
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Health, public transportation and public spaces

Concentration.
Year 2013

Reduction
2013-2009

NOx	26,95 $\mu\text{g}/\text{m}^3$	-8,83%
PM10	18,10 $\mu\text{g}/\text{m}^3$	-49,11%



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Some politicians have voted against the tramway, not citizens

2010 referendum was between three options: change the Diagonal with Boulevard, with central promenade (Rambla) or not refurbishing. According to the crisis third option was the winner, but it was not a referendum about tramway versus electric bus. New city council elections have overpassed this referendum.

Diagonal referendum 2010. Boulevard or Rambla?



City council 2015

Pro-tram: 373.046

BeC: 176.594 vots

ERC: 77.081 vots

PSC: 67.475 vots

CUP: 51.896 vots

(CUP wants public tramway)

Against-tram: 220.188

CiU: 159.222 vots

PP: 60.966 vots

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People wants tramway



Public transport users, bike riders, associations for road safety, pedestrians, trade unions, environment NGO, and neighbors associations claim for tramway!

Plataforma Diagonal per a Tothom (Diagonal for all), since 2010

Plataforma per la Qualitat de l'Aire (Good quality Air), since 2014

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People wants tramway

Marxa Diagonal per a Tothom (2005)



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People wants tramway



x2

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Changes are not easy, but everyone wants solutions



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Changes are not easy, but everyone wants solutions



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Ricard Riol Jurado

www.transportpublic.org

info@transportpublic.org

93 244 49 70