

ESPRIT - a public car system

1

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ESPRIT Advisory Board members

- funded by Horizon 2020
- 2015-2018
- 18 EU partners



Easily diStributed
Personal RapId Transit

*REAL CORP 2018:
EXPANDING CITIES – DIMINISHING SPACE
Vienna, Austria*

+ 20 years



Chemnitz (March 2018)

3



private cars



from dream



to disaster

public space



Mariahilferstrasse, Vienna - 2011



today

MaaS

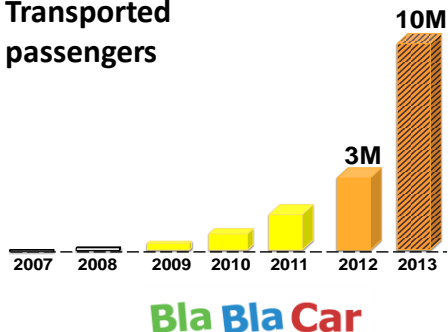
IMaaS (individual mobility)

PSMaaS (public and shared transport)

Carpooling

↔ Fill the cars

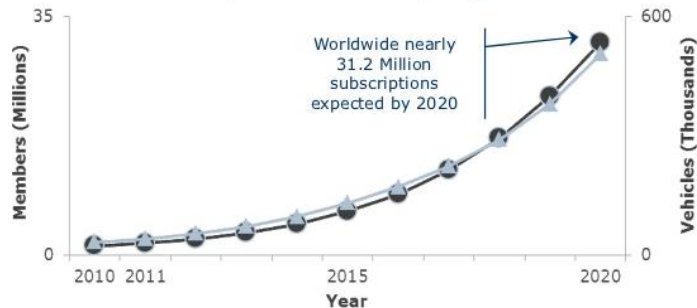
Transported passengers



Carsharing

↔ Increase the use rate of cars

Carsharing Vehicles & Members (World), 2010-2020



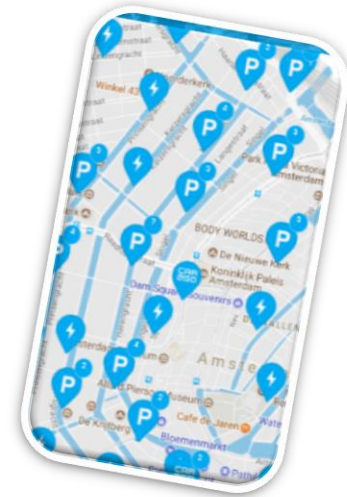
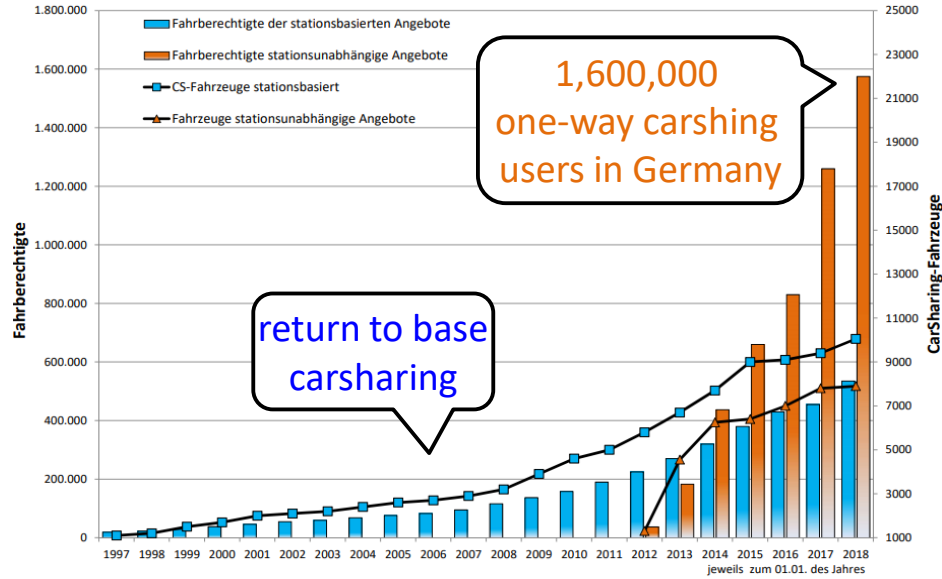
FROST & SULLIVAN

Efficient for long distance.
Not working for commuting to work

A solution for short distances?
A solution for commuting to work?



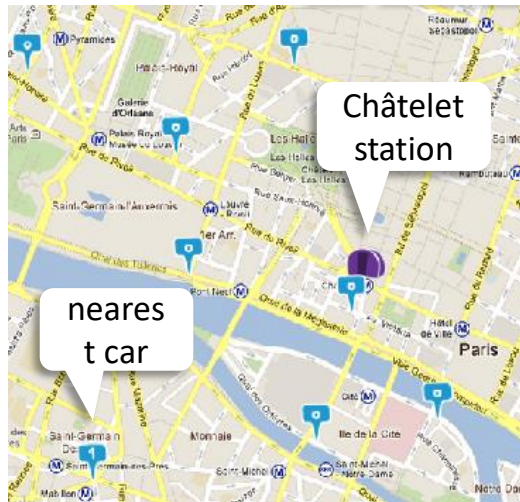
one-way carsharing



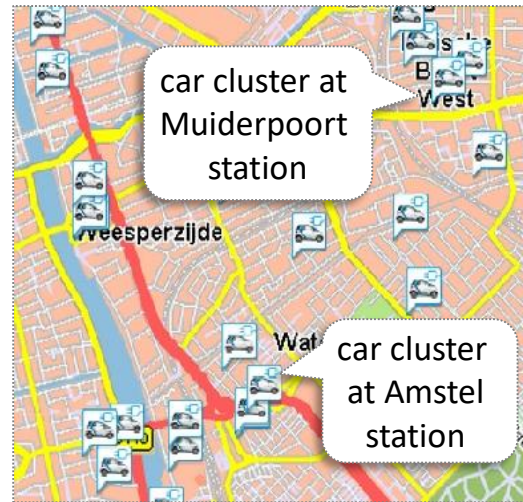
one-way carsharing - problems:

1. *unreliable vehicle supply*
2. *restricted operating areas*
3. *(dependent on sponsorship)*

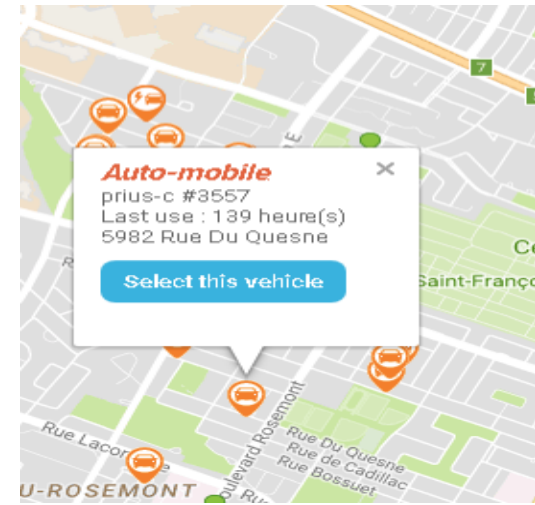
unreliable vehicle supply



no cars for 1 kilometre
In central Paris - Autolib

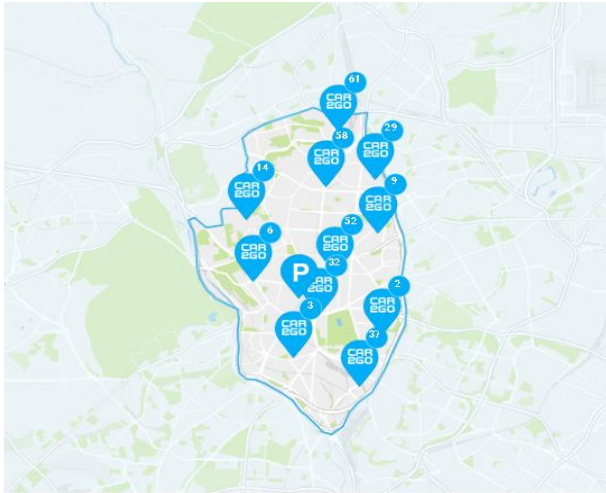


car clusters by train stations
central Amsterdam – Car2go



cars unused for 5 days
Montreal - Comunauto

restricted operating areas



Car2go - Madrid



Multicity - Berlin

dependent on sponsorship (examples)

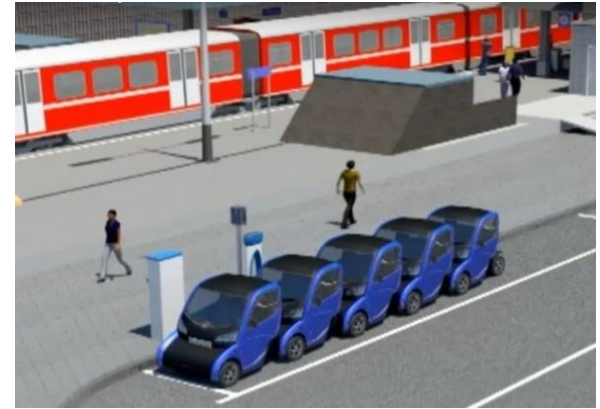
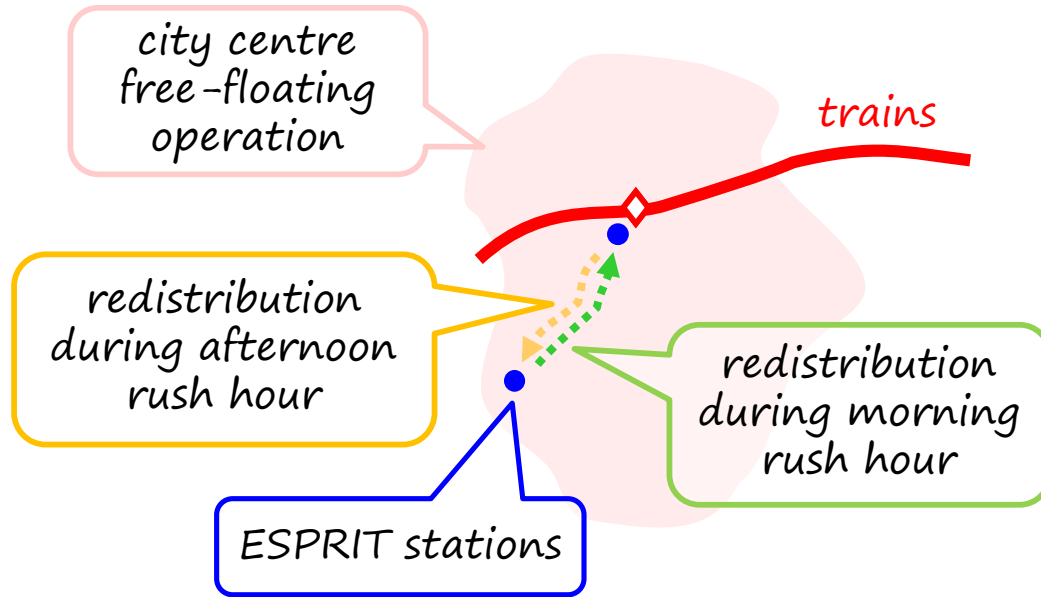
<u>operator</u>	<u>sponsor</u>
Car2go	Daimler
DriveNow	BMW
Multicity	Citroen
Autolib	Bolloré

- city transport funding
- electrical companies (uzilities)

ESPRIT offers:

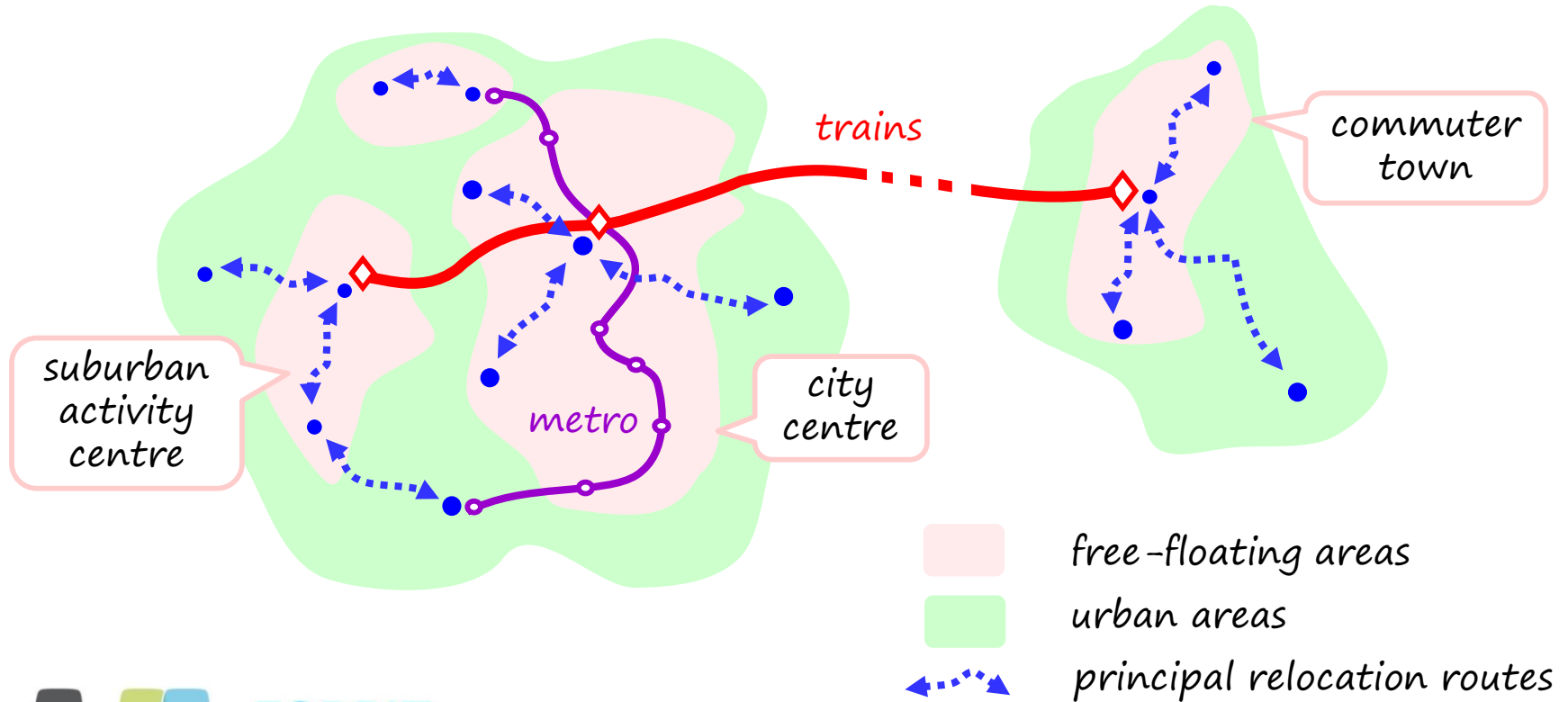
1. *efficient vehicle distribution*
2. *extensive operational areas*
3. *viability for all operators*

efficient vehicle distribution



an ESPRIT station

extensive operating areas



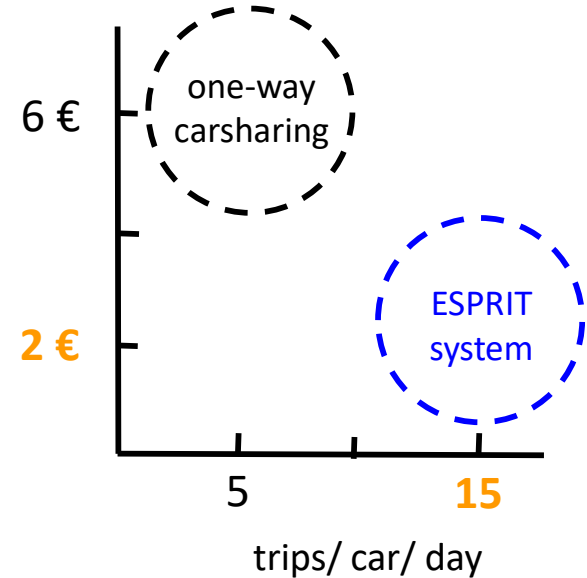
viability for all operators

estimated efficiency:

- from 6 up to **30** cars/ relocator
- from 5 up to **15** trips/ car/ day

fares:

- from 6 € down to **2€** / trip

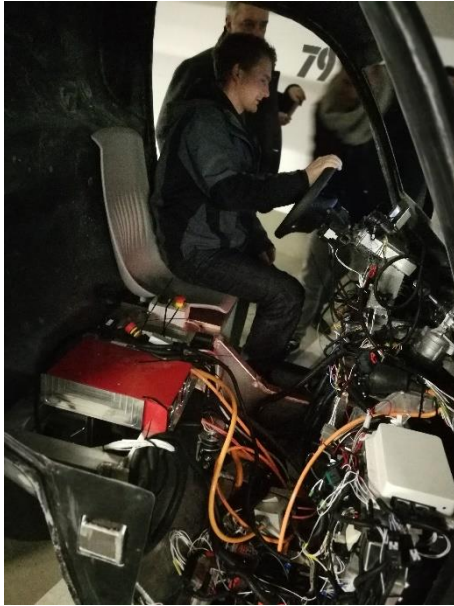


conclusion - ESPRIT provides:

- *public and shared transport*
- *efficient vehicle supply*
- *extensive operational areas*
- *viability for all operators*

- a public car system

complex onboard technology



as it will look like...



tests

20



video of experimental prototype video of docked prototypes

ESPRIT road train demos:

- **Lyon** 29/30 August
 - **Glasgow** 11/12/13 September
 - **L'Hospitalet** (Barcelona) 25/26 September
-
- operational tests are anticipated for 2020
 - commercial exploitation by 2022



- maintenance checked by relocators
- creation of local employment
- early market deployment, 3-4 years



- difficult integration with pedestrians, etc.
- vulnerable to IT failure / hacking
- long term market deployment, 20-30 years

co-authors

co-authors:

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website: <http://www.esprit-transport-system.eu>

ESPRIT Project Partners



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Complementary slides

ESPRIT Rationale and vision

- Transportation both in urban and suburban areas is unsustainable in terms of congestion, environmental and societal aspects.
 - Shared, electric car systems now offer an alternative for personal urban mobility, such as *Car2go* or *Autolib* - there are two million* users in Europe today and expected take up 30% of the market within the next 20 to 30 years*.
 - However, vehicle supply is unreliable – demand cannot be met on time and regular use is unaffordable for most people, due to the high cost of one-by-one redistribution and extensive charging infrastructure.
 - By the 2030's driverless cars may have an answer with the infrastructure needed to enable redistribution of cars to where they are needed*, however ESPRIT will be able to do so by the early 2020's and with a safer system.
-
- The ESPRIT project* is developing a light-weight, L category, electric vehicle with an innovative coupling mechanism that enables roadtrains of up to 8 vehicles to be redistributed easily, thereby assuring availability, affordable use and enabling widespread implementation.



model of ESPRIT roadtrain

ESPRIT operational advantages

ESPRIT cars will have autonomous functions and could be driverless, but the manual redistribution of the roadtrains has important **advantages** over the independent redistribution of driverless cars:

- ESPRIT services could be operating 10 or more years before the public use of driverless cars is possible.
- Roadtrains take up a fraction of the road and parking space of that needed for platooning and parking of driverless cars.
- A roadtrain of 8 ESPRIT cars can be charged from a single charging point and also balance battery charges among cars while redistributing.
- Roadtrains do not depend on ITS* and can be manoeuvred more efficiently, faster and cars can be checked regularly for damage and maintenance.
- ESPRIT systems employ local people, about 25* per fleet of 300 cars



cars can be delivered where and when they are needed

How ESPRIT works

ORIGIN



1-WAY CAR-SHARING



SYSTEM IS READY. ESPRIT VEHICLES ARE CHARGING AT STATIONS



USER MAKES 1-WAY TRIP IN ESPRIT



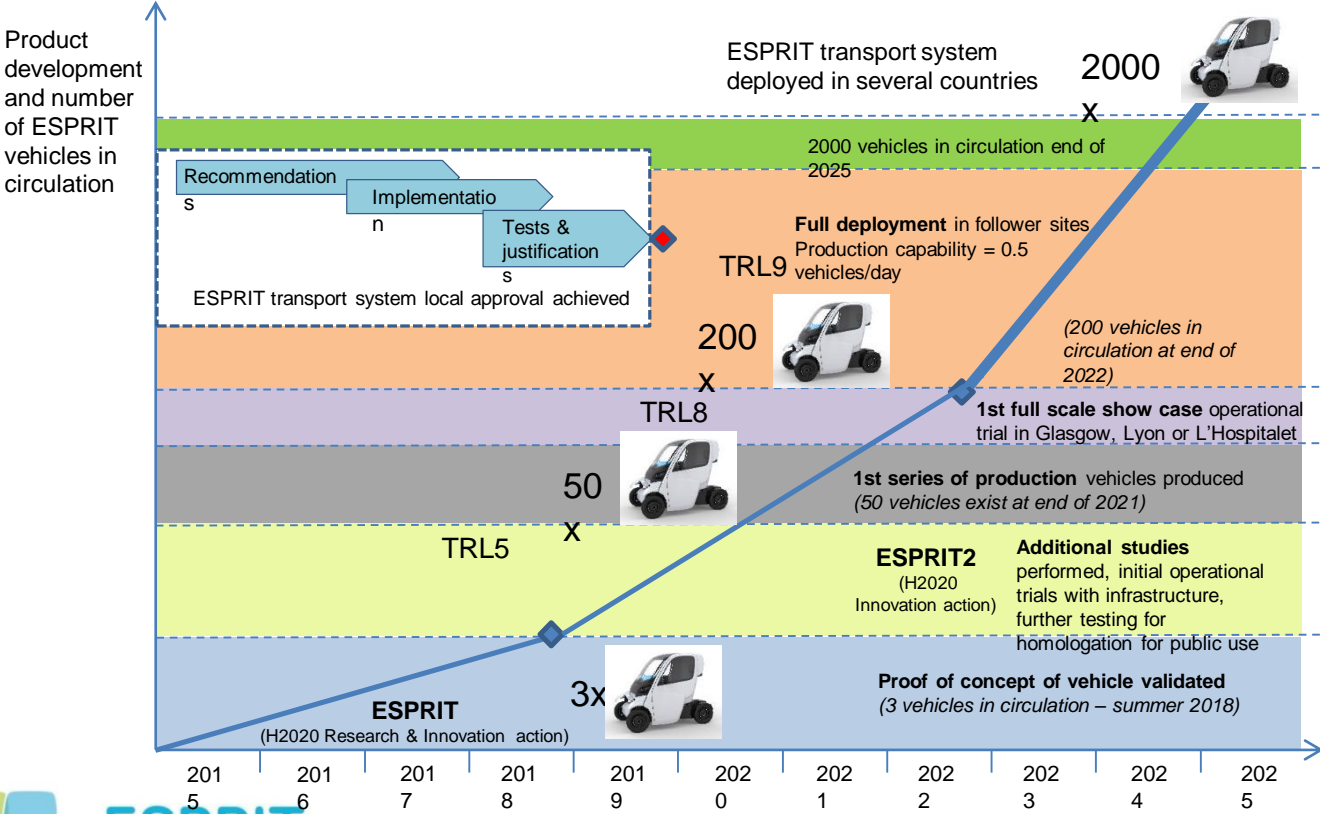
REDISTRIBUTION IN ROAD TRAIN

STATION VEHICLE DISTRIBUTION HAS BEEN REBALANCED

DESTINATION



Planned development of the **ESPRIT** vehicle and system



ESPRIT final demonstration

- Events will last two days and include:
 - Vehicle testing
 - Focus groups
 - Exhibitions
 - Stakeholder workshops



- **Lyon demonstration event**

Date: 29th and 30th August 2018

Venue: Confluences, Lyon, France

- **Glasgow demonstration event**

Date: 1st and 12th September 2018

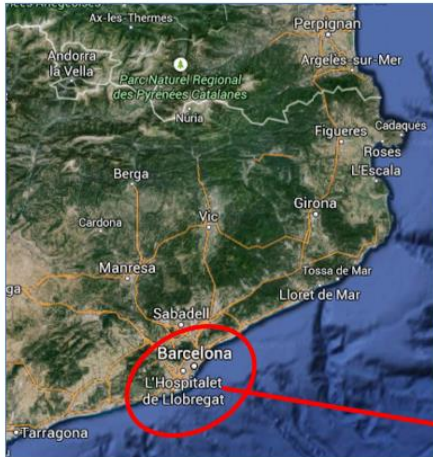
Venue: Hillington Park, Glasgow, UK

- **L'Hospitalet demonstration event**

Date: 25th and 26th September 2018

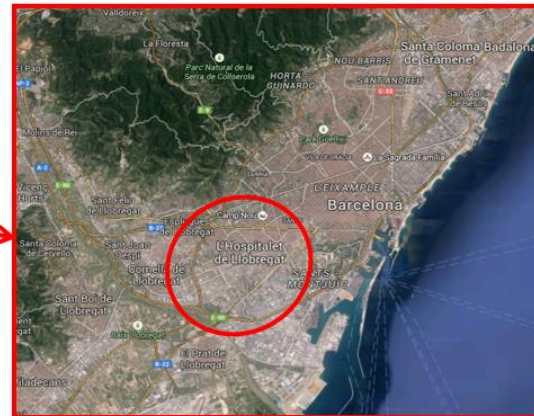
Venue: near Smart City Expo Centre, L'Hospitalet de Llobregat, Spain

Study Area : L'Hospitalet, Barcelona



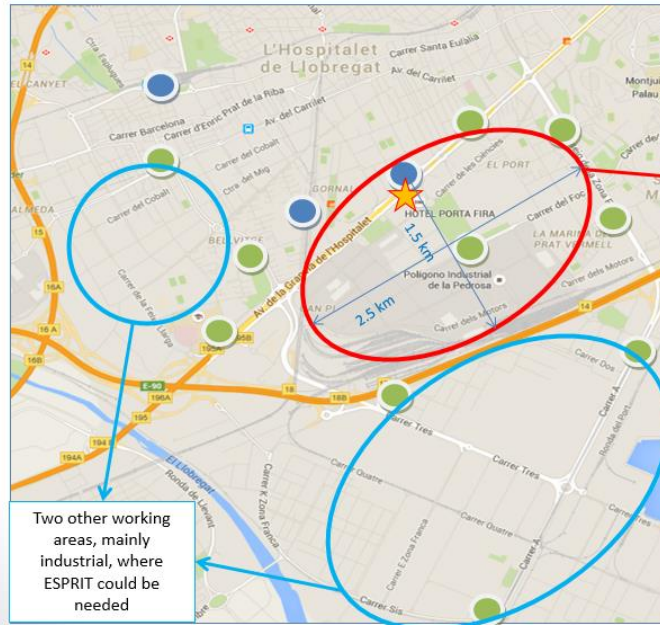
Data about the city:

- 261.310 inhabitants (2nd largest city in Catalonia, and 16th in Spain)
- One of the most densely populated city in the UE
- 12,49 km²
- 7 Administrative districts and 12 neighbourhoods



Study Area : L'Hospitalet, Barcelona

Potential ESPRIT Areas



- L'Hospitalet demonstration site would be located in a 2 km² economical-industrial district, called GranVia.

- GranVia is the second major business district of Barcelona, second largest trade fair and exhibition centres in Europe. It is also an industrial area in its southern part. It is adjacent to "Ciutat de la Justícia de Barcelona i l'Hospitalet", that hosts most of the legal departments of the Barcelona metropolitan area.



ESPRIT pilot station



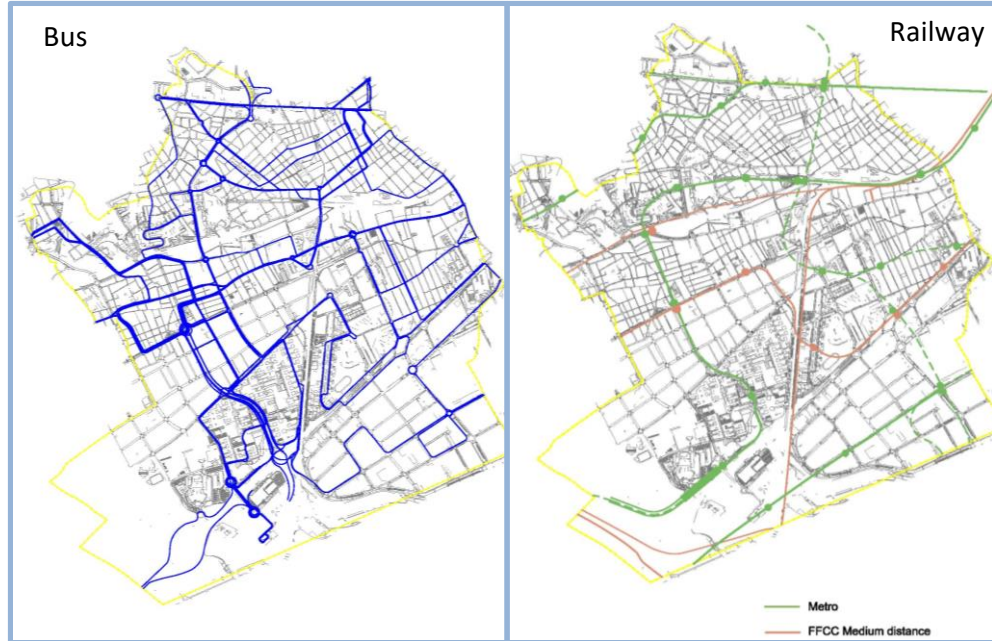
Medium Distance Train station and Underground



Underground stations

Demo Area : L'Hospitalet, Barcelona

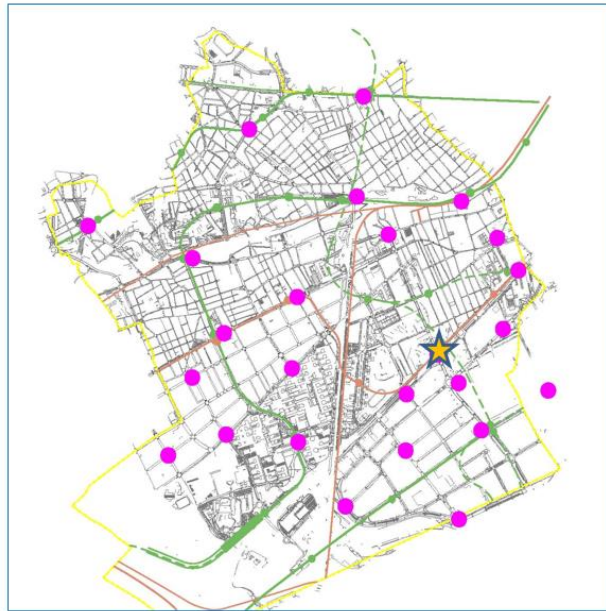
Public Transport



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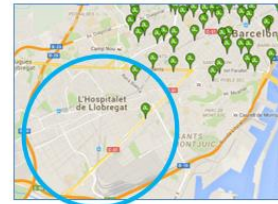
Study Area : L'Hospitalet, Barcelona


Proposed Charging Stations



- Major users of ESPRIT would most likely be:
 - Obligate mobility: Workers coming from outside to L'H by train or metro
 - Puntual mobility from the business park to the city center

- Carsharing available:
NO carsharing available in l'Hospitalet



 ESPRIT pilot charging station

 ESPRIT charging station (proposal)

 Metro

 FFCC Medium distance