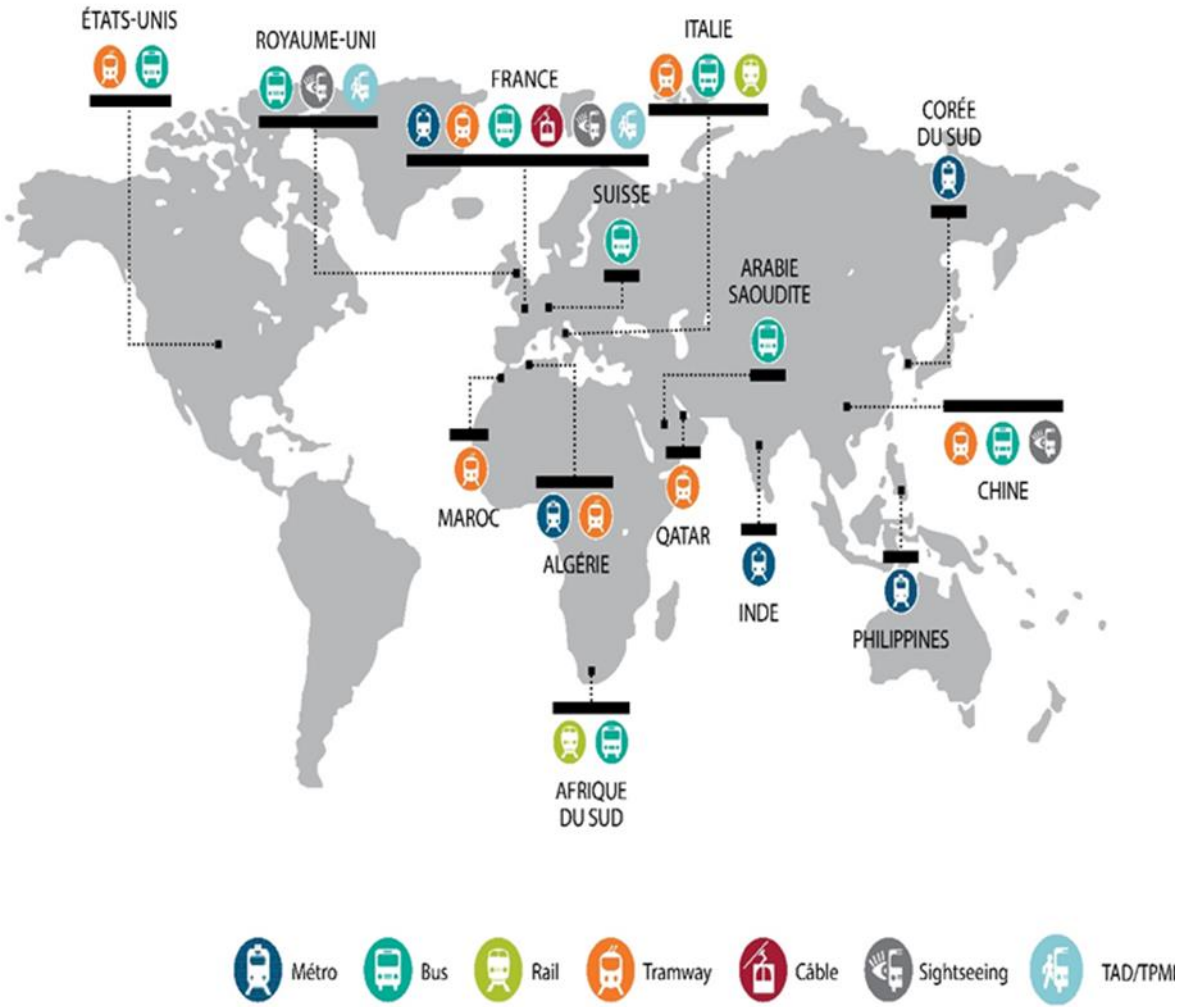
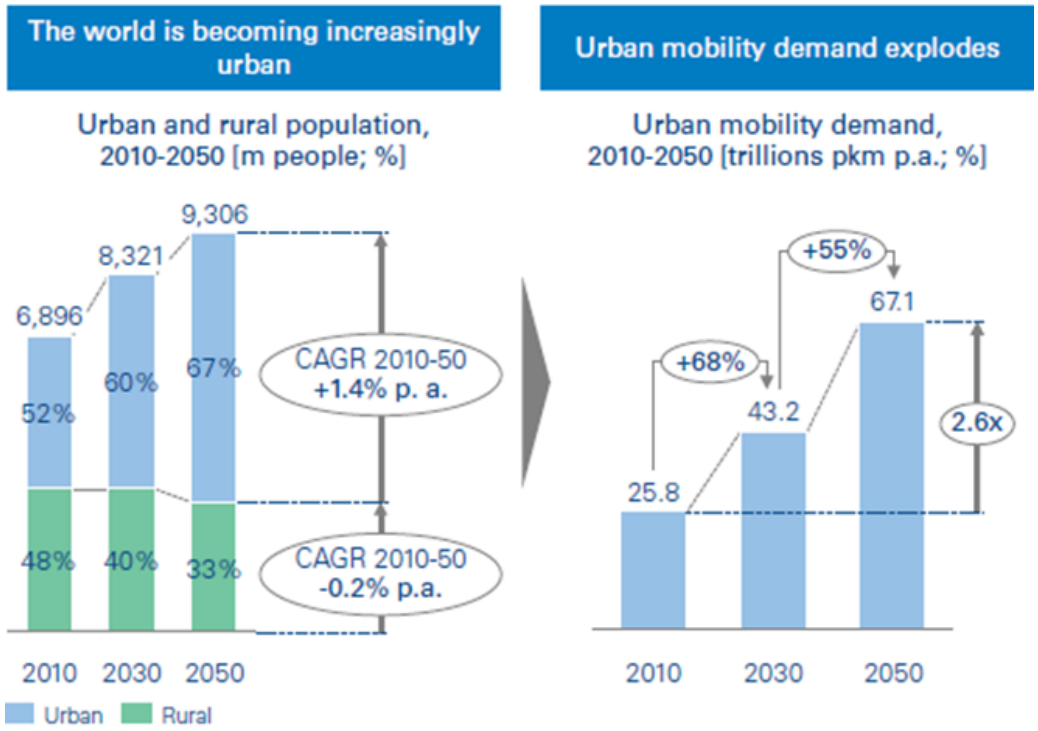
RATP

AUTONOMOUS VEHICLES: A GAME CHANGER FOR URBAN MOBILITY

RATP GROUP WORLDWIDE



1. TRENDS IN URBAN MOBILITY



By 2030

- 60% of the world population will live in cities.
- The mobility demand will increase by 70%.

By 2050

- The number of journeys will be multiplied by 3.

→ Massive investment in public transport will be necessary

1. TRENDS IN URBAN MOBILITY

- **Mobility demand will not just increase, the people's behavior have changed**

  → **They want a "door-to-door" global solution that combines mass transit and other mobility services**

- **In this context,**

  → **Mobility will be a major challenge for public transport authorities and for public transport companies**

  → **Autonomous vehicles could make it possible to offer affordable and sustainable solutions, flexible and on demand services… to all citizens and people living in suburban ou rural areas.**

1. TRENDS IN URBAN MOBILITY

- **Autonomous vehicles are an opportunity to offer new mobility services for mobility needs not currently met…**

  → Areas with less density or low traffic

  → First and last miles

  → On demand services …

… if they are shared and integrated with a public transport system

2. RATP : URBAN MOBILITY SOLUTIONS PROVIDER

- **Innovative and sustainable urban mobility solutions tailored to each region**

  → The public transport network integrates mass transit solutions – subway, tramway, buses, train… and mobility services such us car sharing… and autonomous vehicles tomorrow.

- **Three challenges**

  → Develop door to door service for every passenger
  → Imagine the new urban mobility business model

  → **Integrate the autonomous vehicle as part of our public transport system**

Test program contributes to meet this goal

2. TEST PROGRAM

Autonomous shuttles

France – USA…

Automatic parking operation of buses

Automatic parking operation of tramway

Autonomous cars

2. AUTONOMOUS SHUTTLE – CHARLES DE GAULLE BRIDGE IN PARIS

- January – April 17
- More than 30 000 passengers

- 2 shuttles EZ10 on a dedicated line
- 100% electric

2. AUTONOMOUS SHUTTLE – AUSTIN IN TEXAS

- Marsh 2017
- Austin university in Texas

- EZ10 shuttles
- lane

2. AUTONOMOUS SHUTTLE – BOULOGNE SUR MER IN FRANCE

April 2017

2 EZ10 shuttles

- **Shared line with pedestrian and bycicle**
- **2500 passengers**

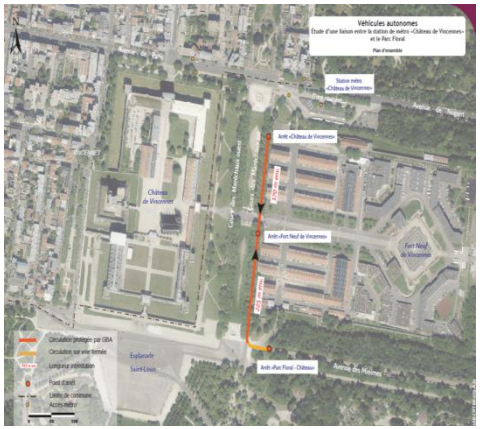
2. AUTONOMOUS SHUTTLES

VIDEO - Navette

2. AUTONOMOUS SHUTTLE – CHATEAU DE VINCENNES STATION IN PARIS

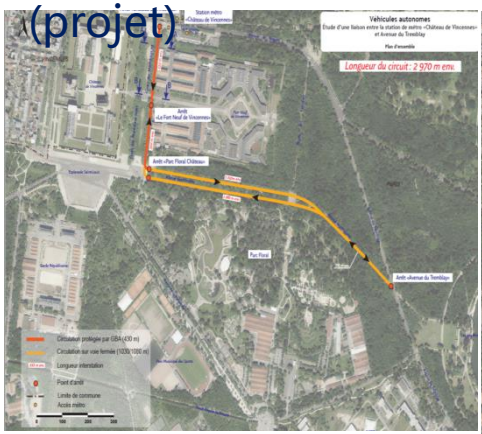
Launched in Novembre for 1 year

Step 1



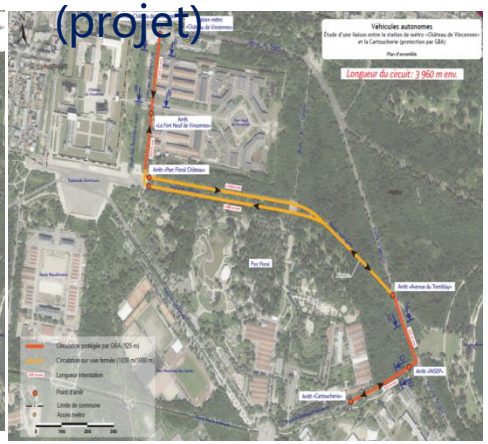
Château de Vincennes station to Parc Floral

Step 2 (projet)



Extension via Minimes avenue + 2 stops

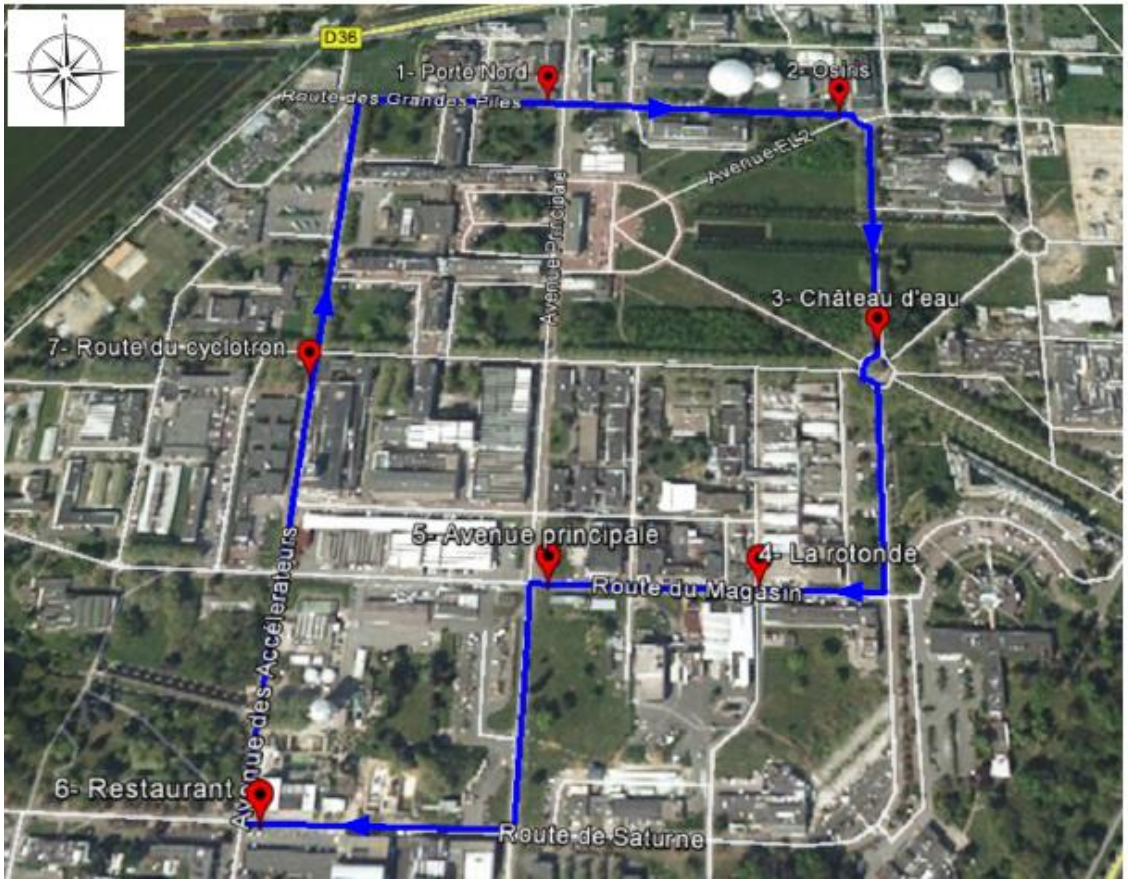
Step 3 (projet)



New extension up to the Cartoucherie Theatre

Mains issues : Crossroads - platooning – increase speed – progressive insertion into the traffic (pedestrian, bycicle, cars)

AUTONOMOUS SHUTTLE – 2018 – CEA PRIVATE SITE AT SACLAY



Longueur du parcours total (m)	2 519	Durée totale du parcours (min)	20.8
Nombre de stations	7	Nombre de départs par heure	7
Temps moyen en station (s)	20	Nombre de passagers maximum par heure	69
Vitesse maximum Vmax (m/s)	3.5	Temps d'attente en station (min)	10.4
Nombre de véhicules simultanés	2	Vitesse moyenne d'opération (m/s)	2

** Données fournies à titre indicatif seulement, les valeurs finales seront déterminées durant le Setup*

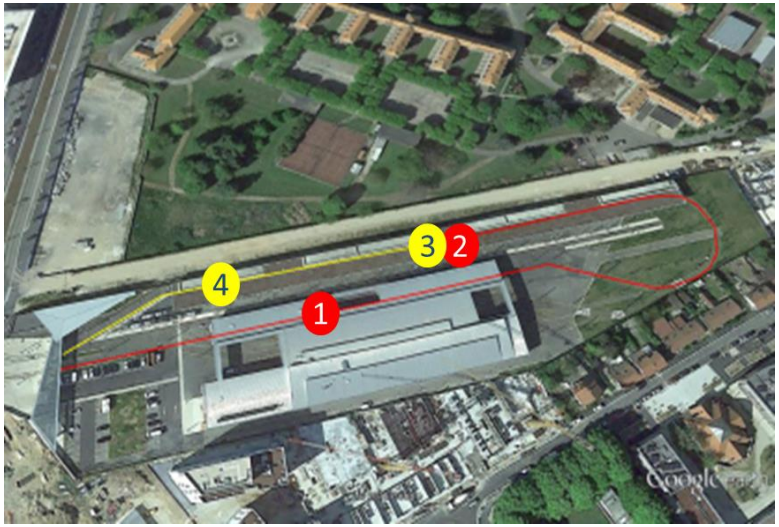
	Station
	Parcours de l'EZ10

2. BUSES AND TRAMWAY – AUTOMATIC PARKING

Optimize available space in bus and tramway depot

Save time by automatically parking buses and tramways

Demonstration – 2018 Marsh – Bus depot



First test – 2017 May - Tramway depot

BUSES AND TRAMWAY – AUTOMATIC PARKING

VIDEO - Tram

3. AUTONOMOUS VEHICLE NATIONAL PROGRAM

→ Large scale experiment from mid 2018
→ Affordable autonomous vehicle for all from 2020




Ambitions for France

→ A place for autonomous vehicle experiments
→ A center of excellence for embedded intelligence technologies
→ A key player in critical safety system

INDUSTRIE DU FUTUR

Scopes

→ Legal framework
→ Experiments
→ Safety
→ Key technologies

The program deals with three types of uses

→ Individual uses
→ Collectif and shared uses
→ Industrial uses

3. FOCUS ON THE AUTONOMOUS PUBLIC TRANSPORT SYSTEM

Community

3. FOCUS ON THE AUTONOMOUS PUBLIC TRANSPORT SYSTEM

Main Topics

- Use case and experiments
- Security, safety
- Vehicle and infrastructure spécification
- Test and homologation
- Regulation

CONCLUSION

A worldwide competition

Things are moving very fast and we need to be able to cope with this