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Road Congress
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DUPLEX A86 – AN INNOVATIVE AND SUSTAINABLE SOLUTION TO COMPLETE THE 2nd RING ROAD OF GREATER PARIS REGION

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- The concession
- What was the problem?
- Some aspects of the project
- Focus on safety
- Toll policy
- Benefits of the project
- What about the future of this concept ?

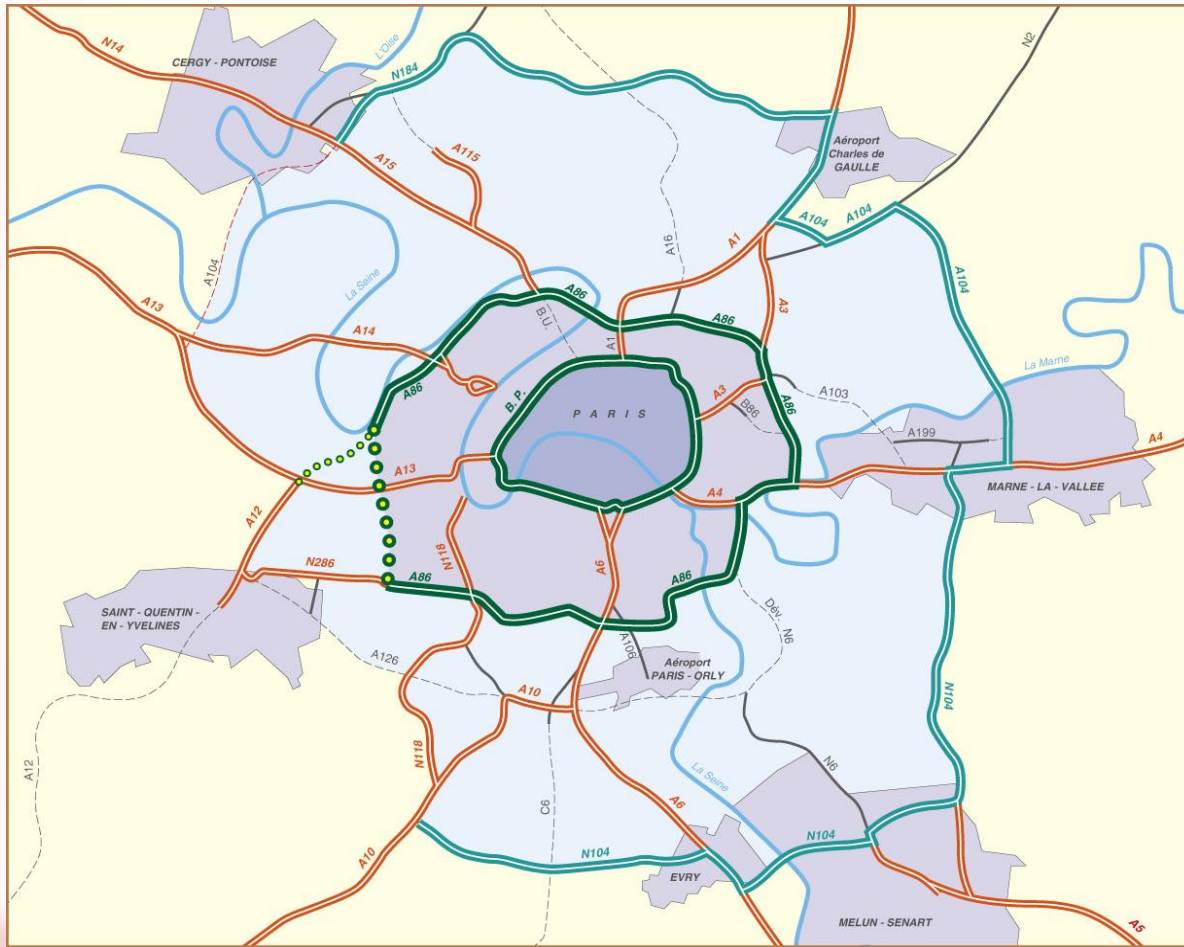


DBFO CONTRACT WITH THE FRENCH STATE

- 75 years DBFO contract
 - Cofiroute takes the risks of financing, design, construction costs, traffic forecast, operation costs.
- 2 200 million euro private investment
- No public funding, no subsidies
- Financed on a toll base by Cofiroute through its balance sheet (no project financing)
- First section opened on June 2009
- Second section opened on January 2011



MAIN FIGURES (POPULATION) AND MAIN ROADS

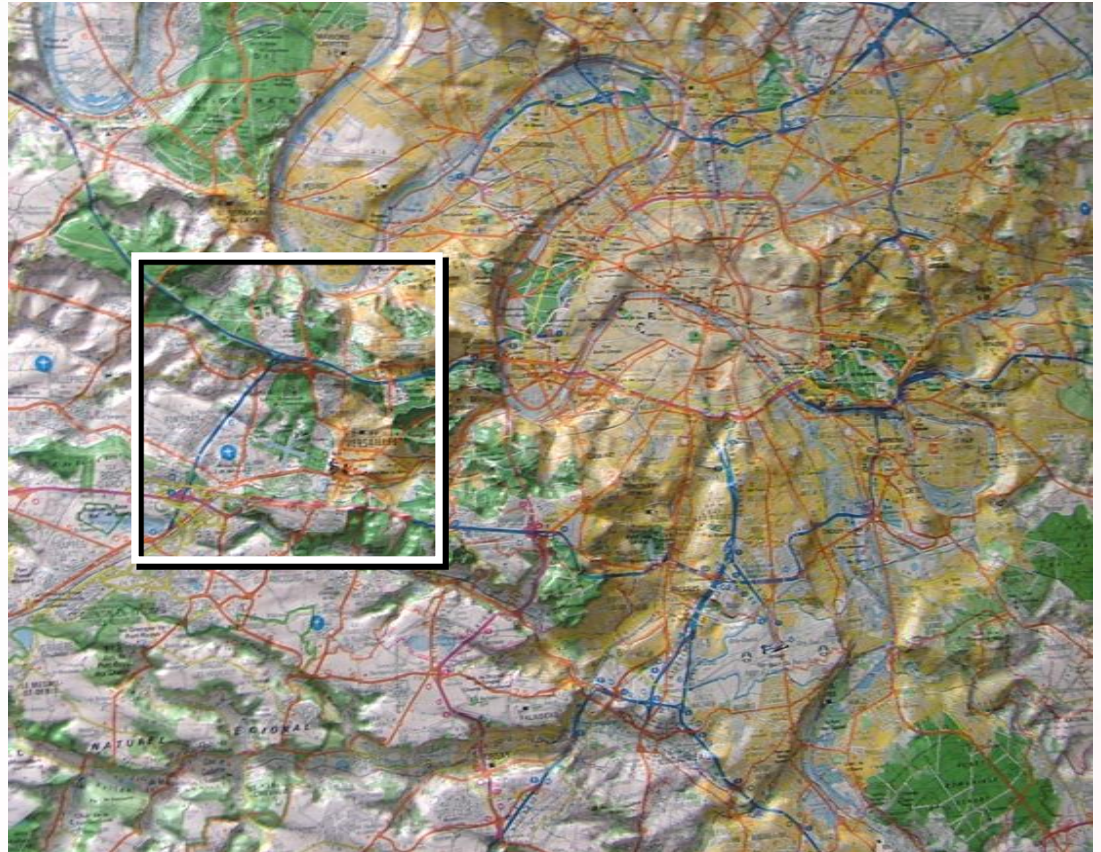


- Paris
 - 86 km²
 - 2 million inhabitants
- Région
 - 12 000 km²
 - 11 million inhabitants
- Traffic jam in the peak hours up to the third ring road
- The need : complete the second ring road



A sensitive area

- Historical sites (Versailles castle, ..)
- Environmentally protected areas (Parisian green belt)



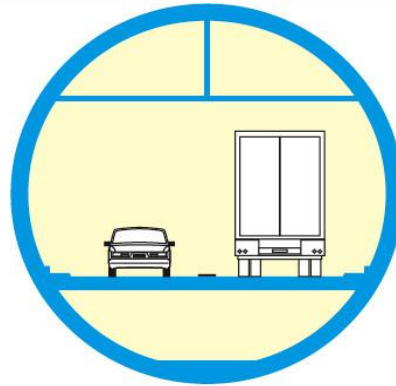
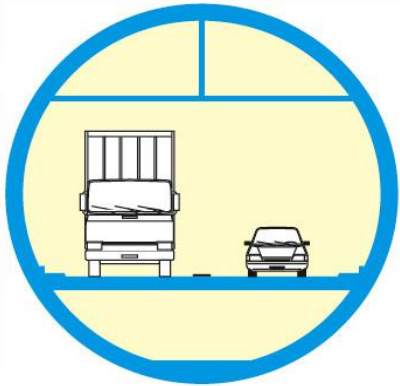
« DUPLEX A86 » : PROJECT GOALS

- Complete the second ring road (A86)
- Fully underground solution
- No public funding
- Maximize public benefits
 - Reduce traffic on surface roads
 - Improve the quality of life of the neighborhood

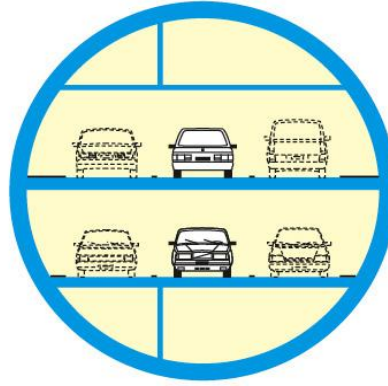
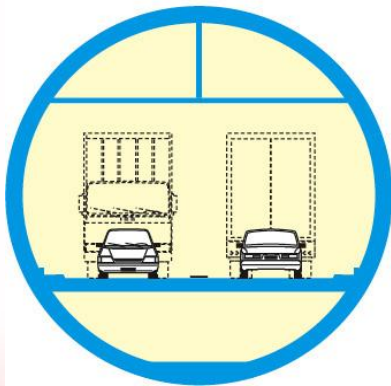


A PRIVATE INITIATIVE BASED ON AN INNOVATIVE DESIGN

- Standard design : 1 tube per direction = 4 lanes



- Innovative design : 1 tube per type of vehicle = 8 lanes



A PROJECT TO BE FINANCED THROUGH TOLLS

The design allows :

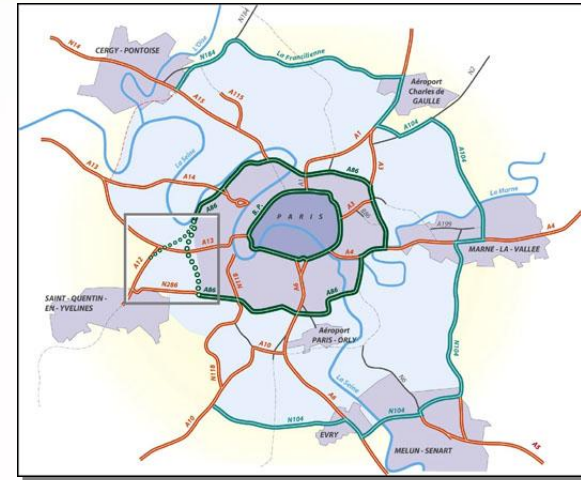
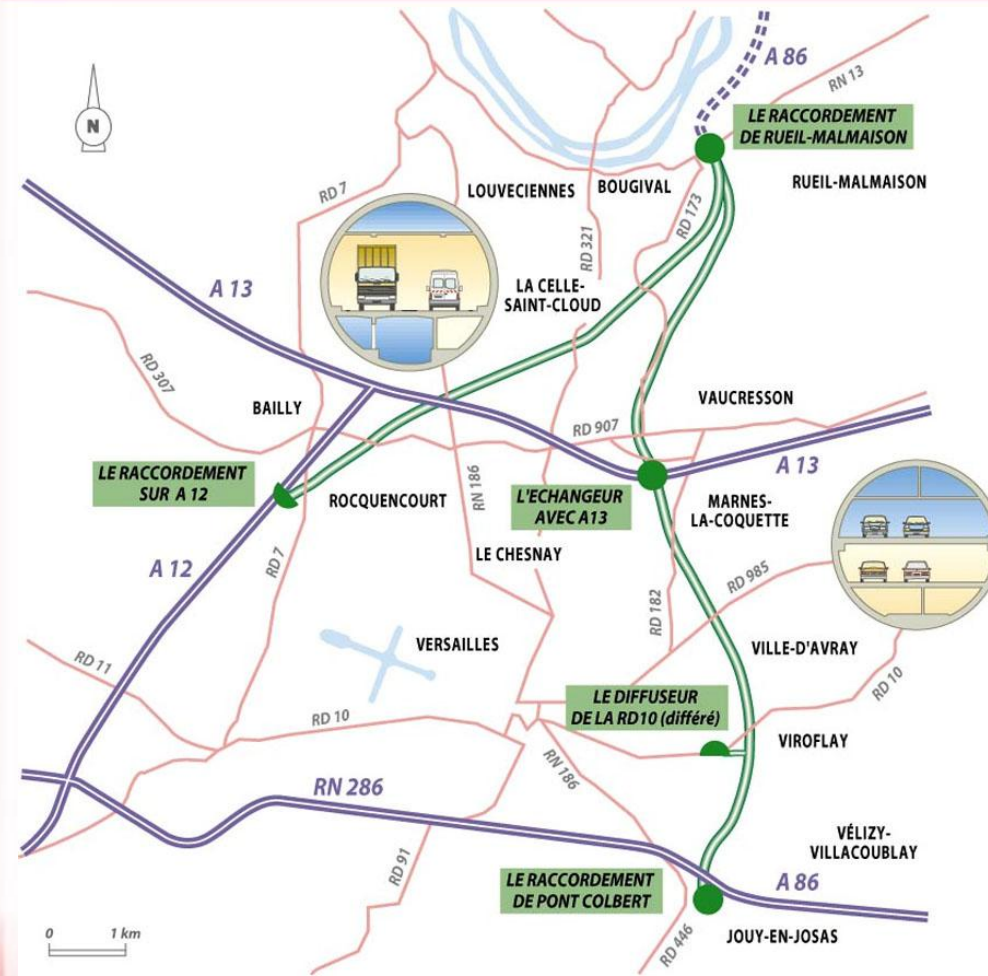
- Doubling the tunnel's capacity
- Intermediate interchange to allow for connection between the tunnel reserved to light vehicles and surface roads
- Different route for each tunnel to match traffic needs and thus better efficiency

These key elements of the design result in better public utility and better return on investment for the concessionaire.

Assumption : car users are ready to pay around 7 to 9 € to save thirty to forty minutes in the peak hour.



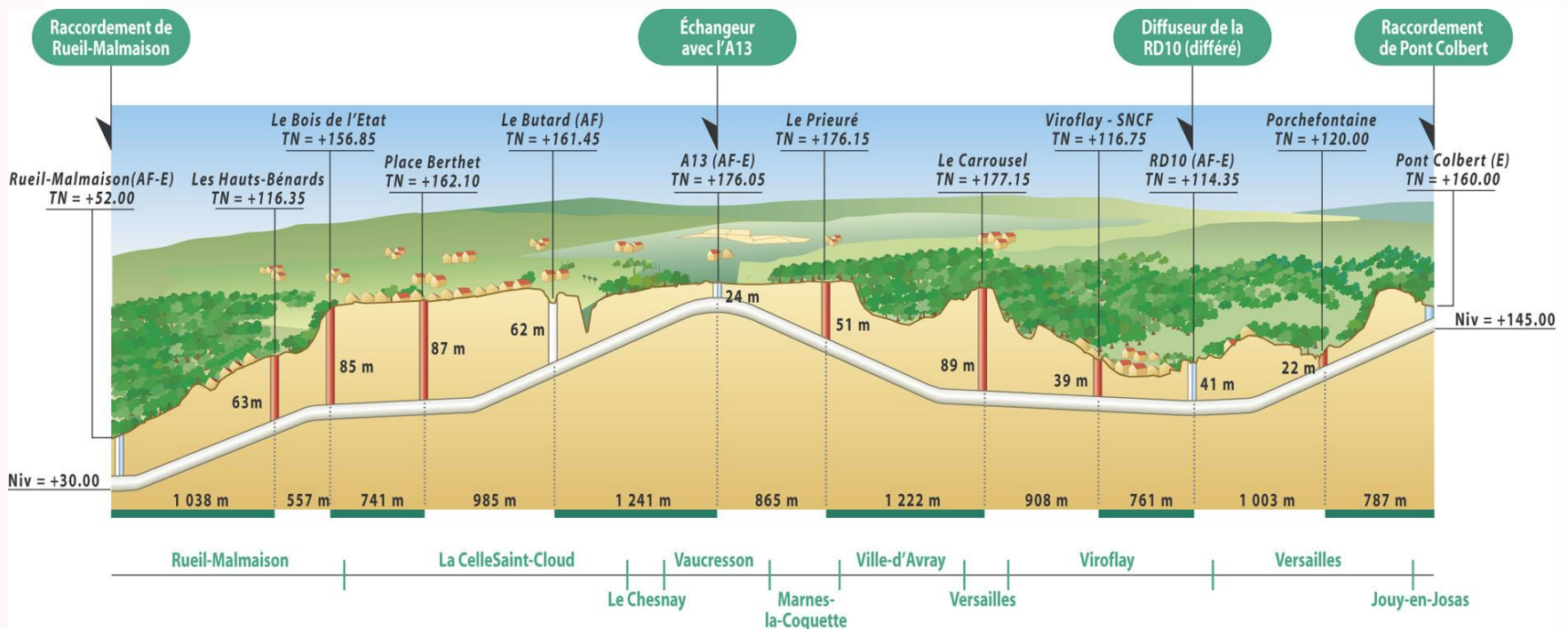
THE PROJECT DECLARED OF PUBLIC UTILITY (DECEMBER 1995)



- One double deck tunnel of 10 km for light vehicles
- One intermediate interchange
- One single tunnel of 7 km for all type of vehicles (under study)



LONGITUDINAL PROFILE OF THE « DUPLEX A86 » TUNNEL



- Depth : from 20 to 80 m
- Maximum slope : 4.5%
- 13 different geological layers

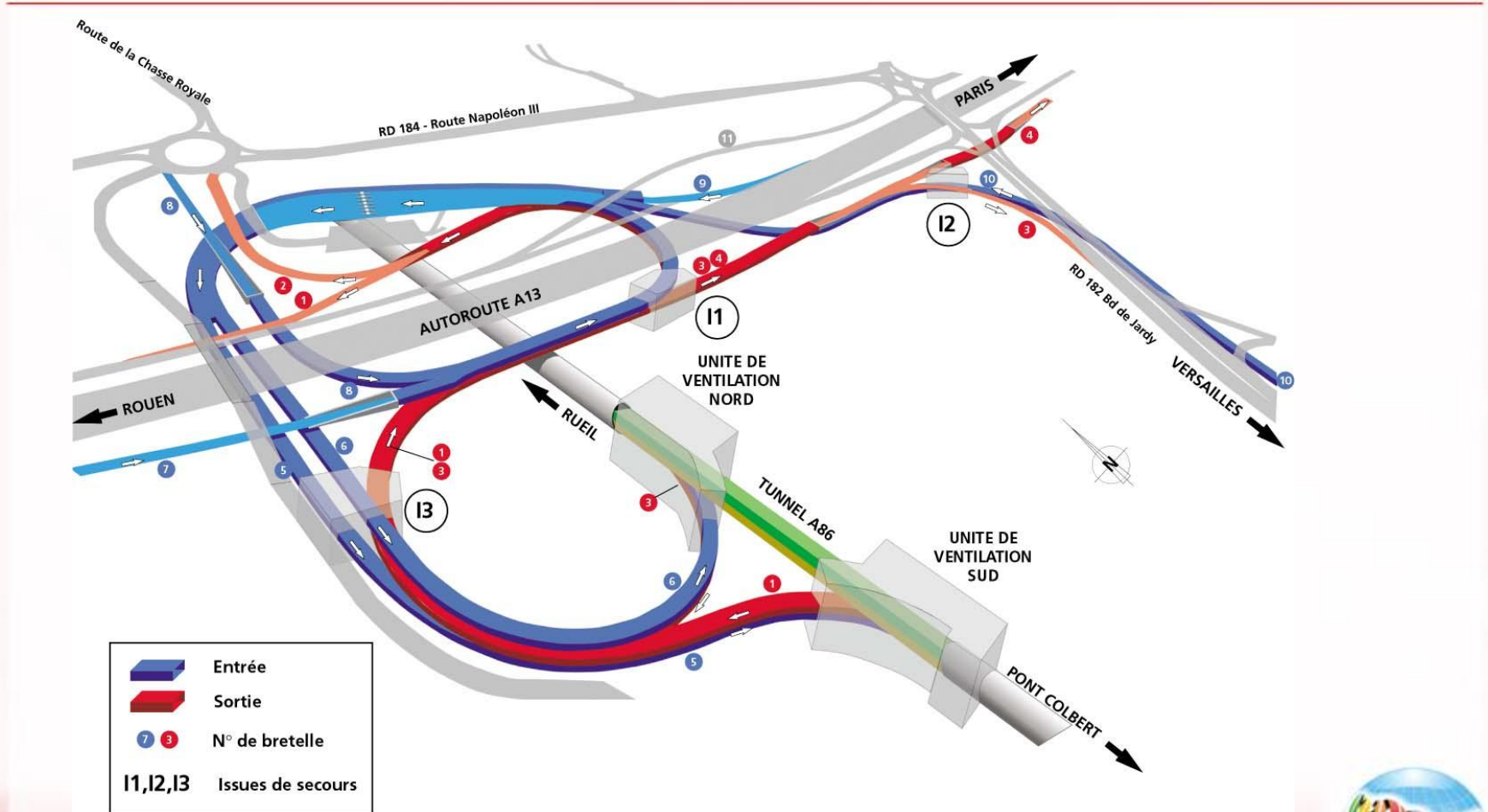


THE A86/A13 UNDERGROUND INTERCHANGE

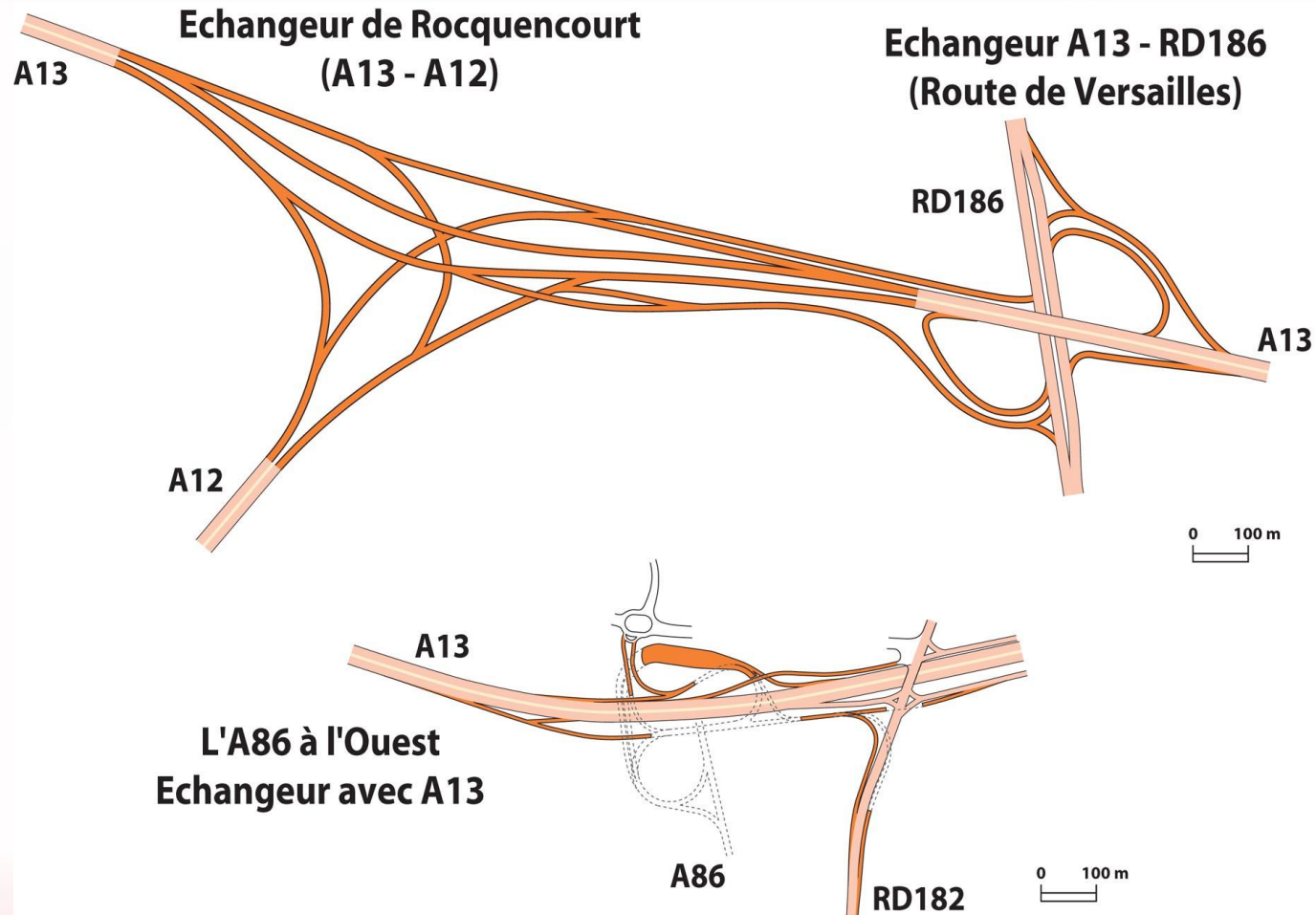
- 4 ramps with the A13 highway
- 4 ramps with local roads
- 3 km of secondary tunnels for the ramps
- One toll plaza



THE A86/A13 UNDERGROUND INTERCHANGE

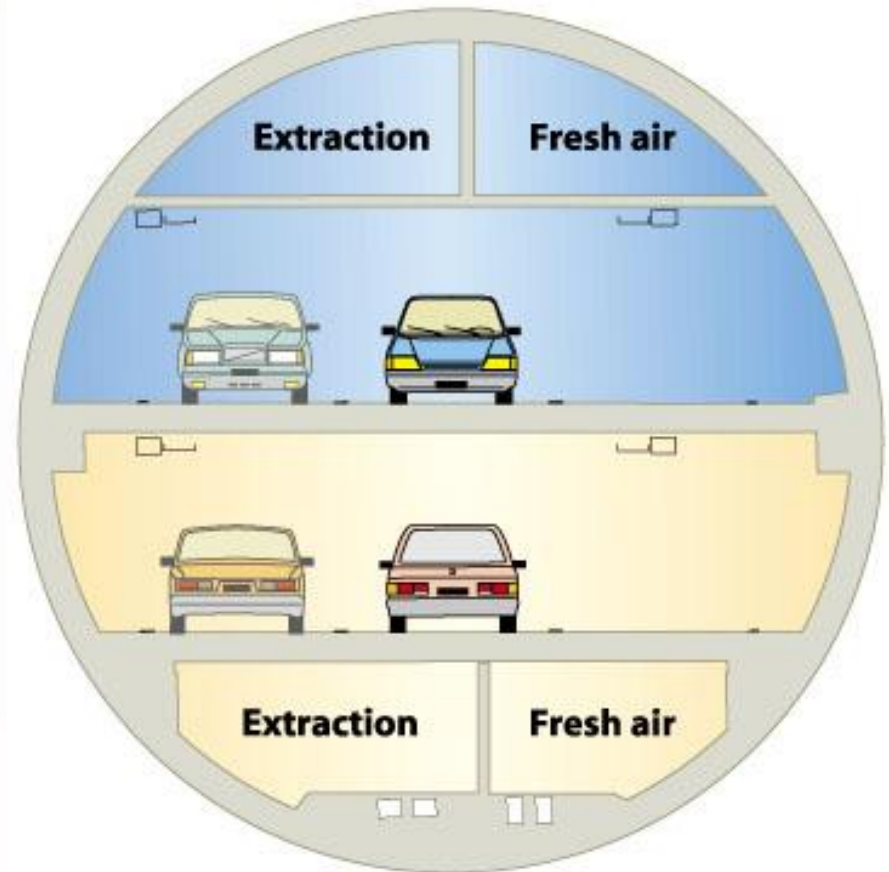


THE A86/A13 UNDERGROUND INTERCHANGE NEEDS A VERY LIMITED AREA



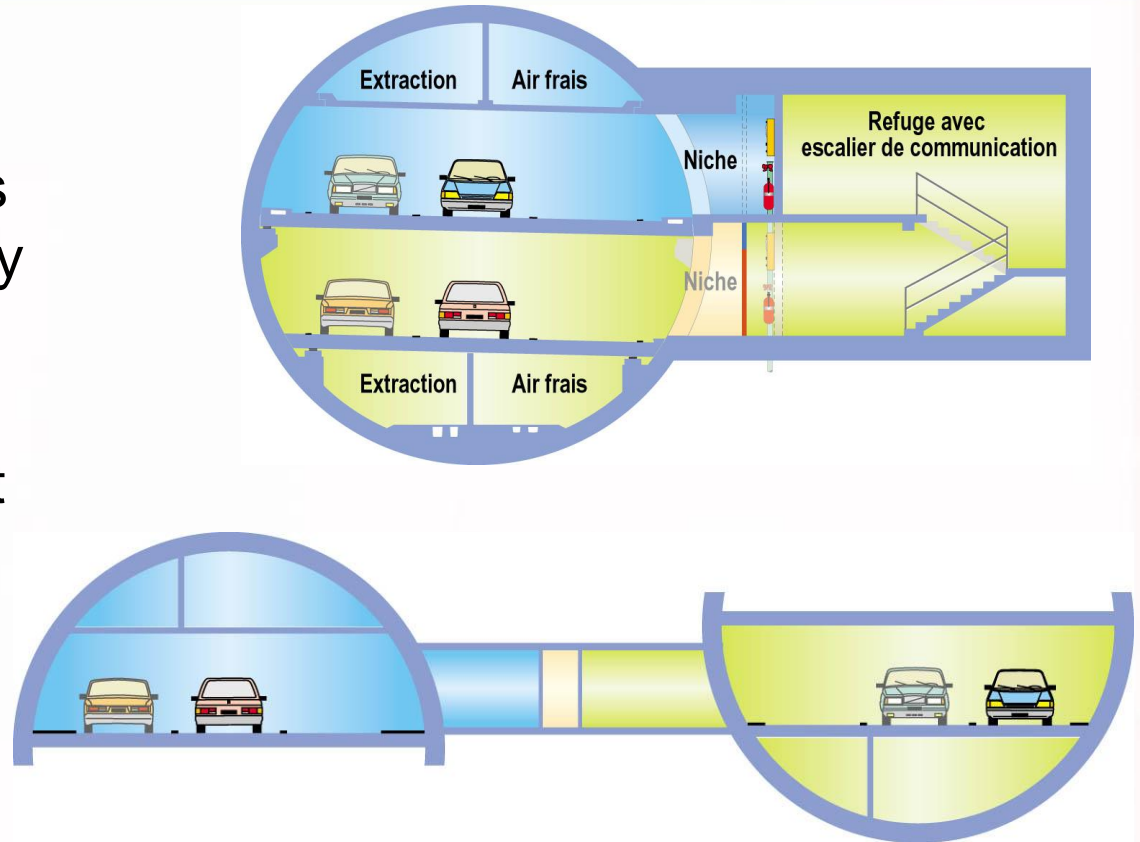
SECTION OF THE « DUPLEX A86 »

- Maximum height of vehicles: 2m
- Clearance : 2,55 m
- Inside diameter: 10,40 m
- Special vehicles for the fire brigade



« TWO TUNNELS IN ONE RELATED EVERY 200 M »

- For operation the tunnel acts as two independent tunnels interconnected every 200m by stairs with shelters
- In case of accident in one tube, emergency crews can access through the other tube



FIXED WATER MIST SPRAY SYSTEM



Our objective : Provide high quality conditions for peaceful driving

An innovative approach taking into account the driver's perception :

- Use of a dynamic driving simulator
- A social sciences research program oriented the communications policy and project architecture: multiple domains (anthropology, psychiatry, political science, linguistics, etc.), including a survey of 3000 people.



DUPLEX A86 : DESIGNED FOR PEACEFUL DRIVING



PRICING POLICY – TRAFIC MONITORING

Pricing set up in order to keep the tunnel free of congestion

- Without traffic jam the safety condition are improved

Toll levels

- 9 € per trip (total length) in the peak hour
- 6 € in normal hours
- 2 € during the night
- Subscriptions according to the number of trips per month (up to 35% discount)

Traffic 2011: 24 000 vehicles per day (average Monday to Friday)



SR91 EXPRESS LANES IN CALIFORNIA : A LONG EXPERIENCE OF TRAFIC MONITORING



SR91 EXPRESS LANES IN CALIFORNIA : CONGESTION PRICING POLICY

Toll Schedule – Eastbound

	Sun	M	Tu	W	Th	F	Sat
Midnight							
1:00 am							
2:00 am							
3:00 am				1.05			
4:00 am							
5:00 am							
6:00 am							
7:00 am							
8:00 am	1.40			1.75			
9:00 am							
10:00 am	2.10						2.10
11:00 am							
Noon						2.60	
1:00 pm	2.50		2.35		2.60	4.05	2.50
2:00 pm			3.40		3.50		
3:00 pm			3.65		3.90	6.25	
4:00 pm		4.40	5.00	5.50	7.00		
5:00 pm	2.10	5.70	5.50	6.25	7.00	6.25	
6:00 pm		3.65	3.80	3.90	4.10	4.40	2.10
7:00 pm			2.60		3.70	4.10	
8:00 pm					2.35	3.70	1.75
9:00 pm			1.75			2.35	
10:00 pm			1.05			1.75	
11:00 pm							

Toll Schedule – Westbound

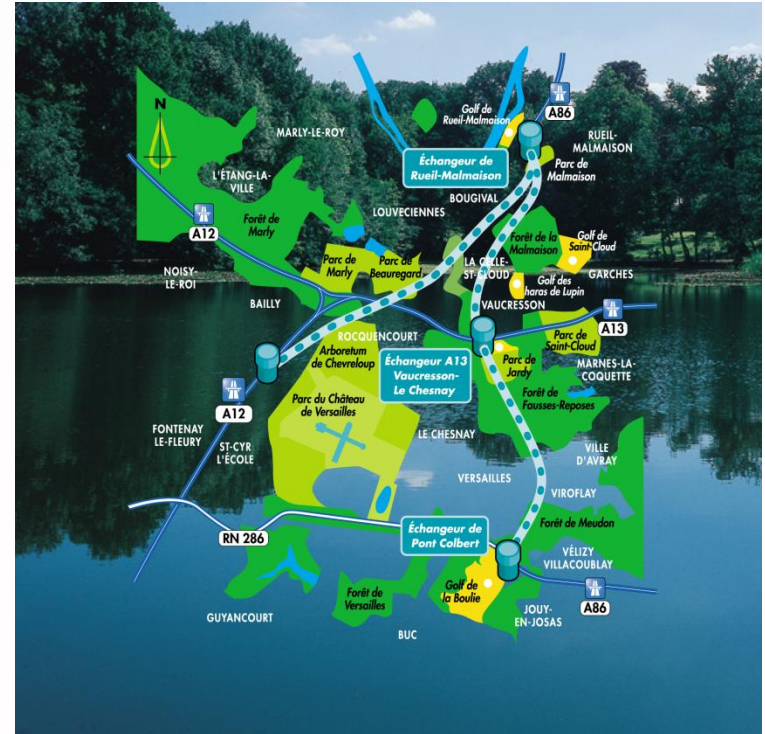
	Sun	M	Tu	W	Th	F	Sat
Midnight							
1:00 am							
2:00 am				1.05			
3:00 am							
4:00 am				2.00			
5:00 am				3.30		3.20	
6:00 am				3.40		3.30	
7:00 am				3.75		3.65	1.50
8:00 am	1.50			3.40		3.30	1.75
9:00 am				2.75			2.10
10:00 am							
11:00 am	2.10						
Noon							
1:00 pm				1.75			2.40
2:00 pm	2.40						
3:00 pm							
4:00 pm						2.10	2.55
5:00 pm	2.55						
6:00 pm						2.50	2.10
7:00 pm						1.75	
8:00 pm	2.10						
9:00 pm				1.05			
10:00 pm							
11:00 pm							



THE NATURAL ADVANTAGES OF THE DUPLEX A86

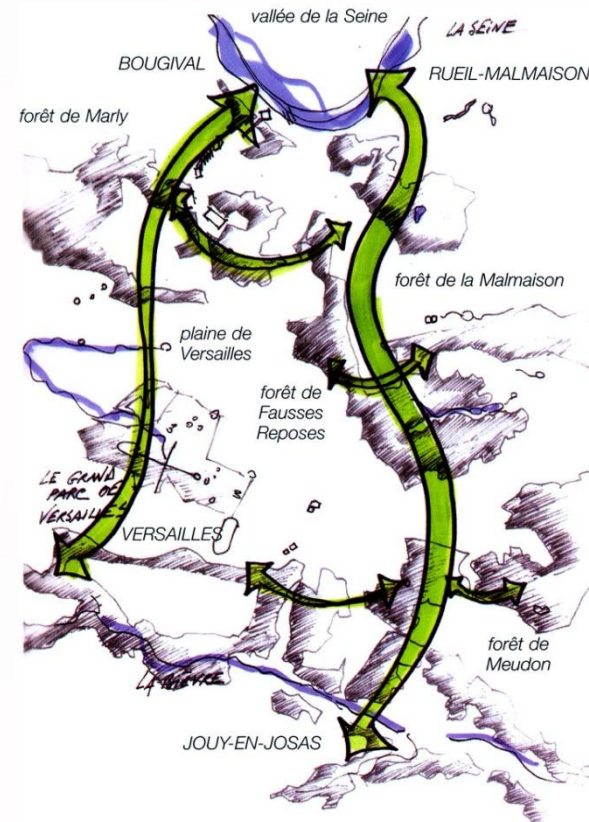
The underground solution allows :

- to reduce harmful effects during construction (**no effect on city activities**)
- to preserve the forested land of the Parisian green belt (**landscape**)
- to avoid harmful effects in the residential areas (**noise**)
- to limit the visual impact on historic monuments (**patrimony**)
- to relieve the congestion on surface (**traffic**)
- to contribute to the reduction of greenhouse gas emissions (**air**)



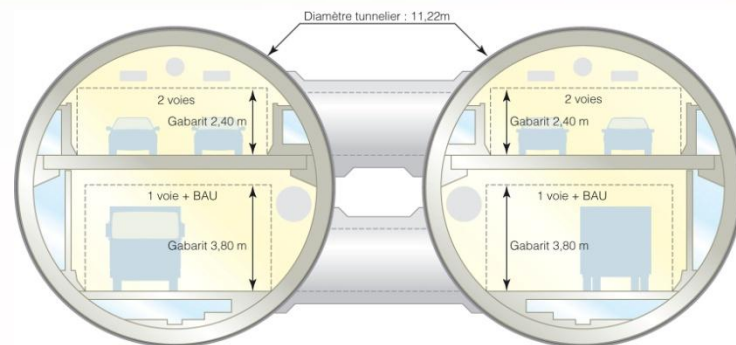
COFIROUTE'S COMMITMENT : THE « 1% LANDSCAPING

- Financing of landscaping carried out by communes
- 7.5 M€ budget
- Examples of projects carried out :
 - Pedestrian footpaths,
 - Cycle tracks
 - Promenades along the Seine,
 - Bridle paths



WHAT ABOUT THE FUTURE FOR THIS TYPE OF CONCEPT?

- Complete a missing link in a very sensitive area
 - Fuxing Road tunnels beyond the river in Shanghai
 - Project in Seoul
- Could be an alternative to urban toll in core cities
 - Toll as a service (reduced time of travel and quality of travel)
 - On a freedom base
 - Instead of “urban toll” as a tax to everybody





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