

Urban highways in the Paris region

Traffic management in the Paris region



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RÉPUBLIQUE FRANÇAISE

direction

interdépartementale

des routes

Île-de-France

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Head of operating department

Urban highways in the Paris region

SUMMARY

PART 1 : Overview

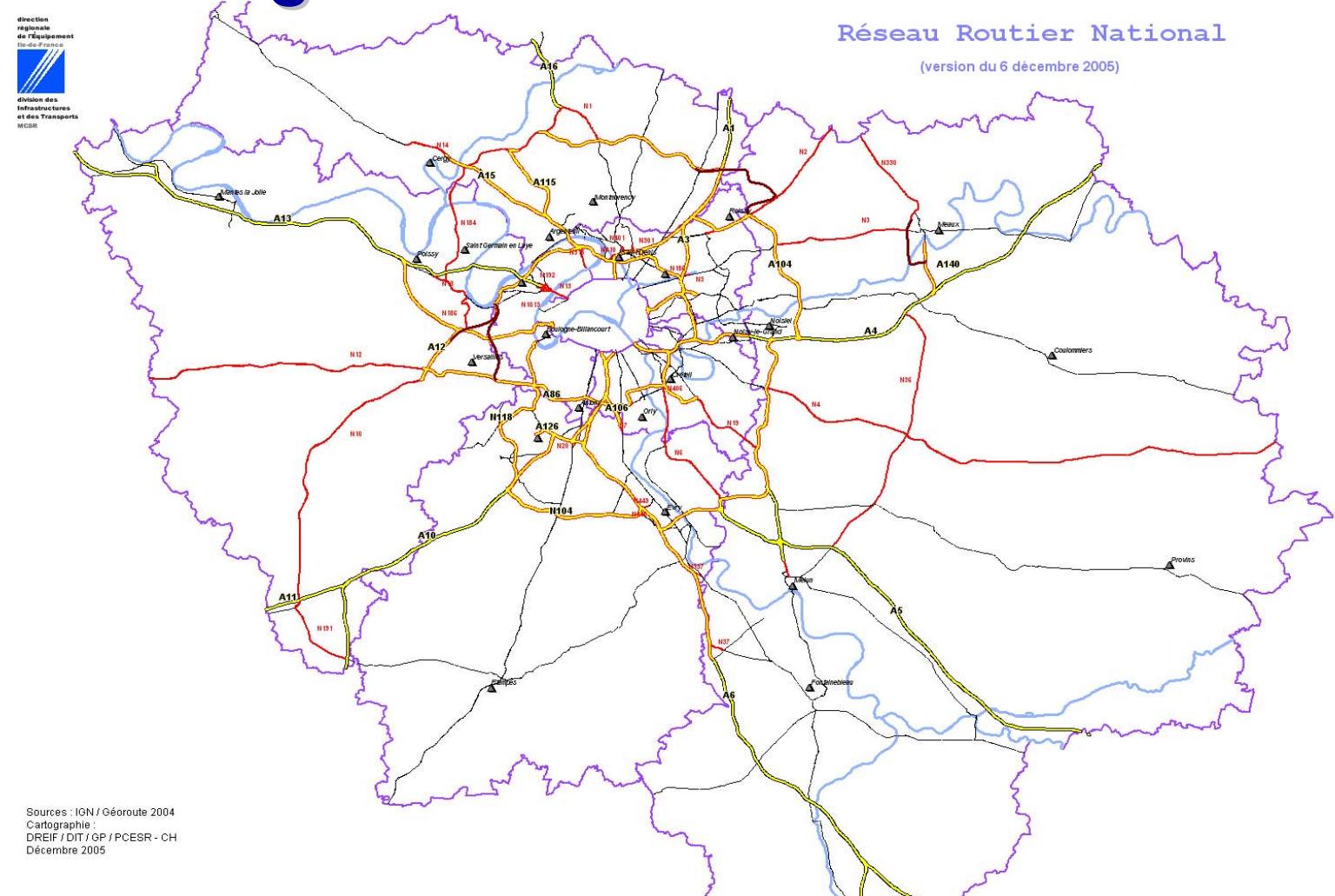
- Presentation of Paris and its region
- Mobility data
- The public highways operator

PART 2 : Traffic management on the Paris region highways network

- SIRIUS : from safety information to traffic management
- Future : physical tools for traffic management, a more integrated organization

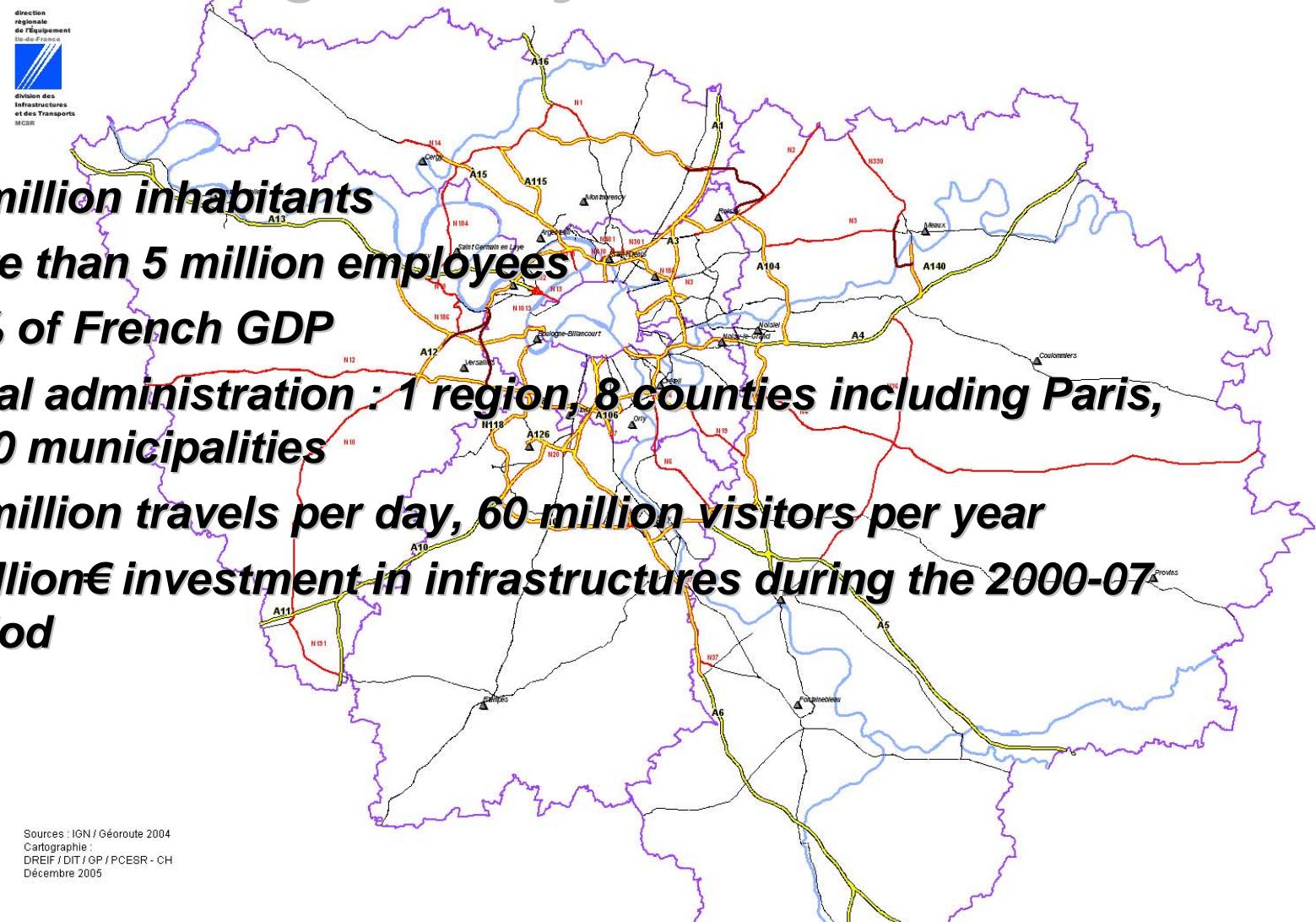
Urban highways in the Paris region

Paris region : Ile-de-France



Urban highways in the Paris region

Paris Region : key data



- ▶ **11 million inhabitants**
 - ▶ **More than 5 million employees**
 - ▶ **28% of French GDP**
 - ▶ **Local administration : 1 region, 8 counties including Paris, 1300 municipalities**
 - ▶ **35 million travels per day, 60 million visitors per year**
 - ▶ **6 billion€ investment in infrastructures during the 2000-07 period**

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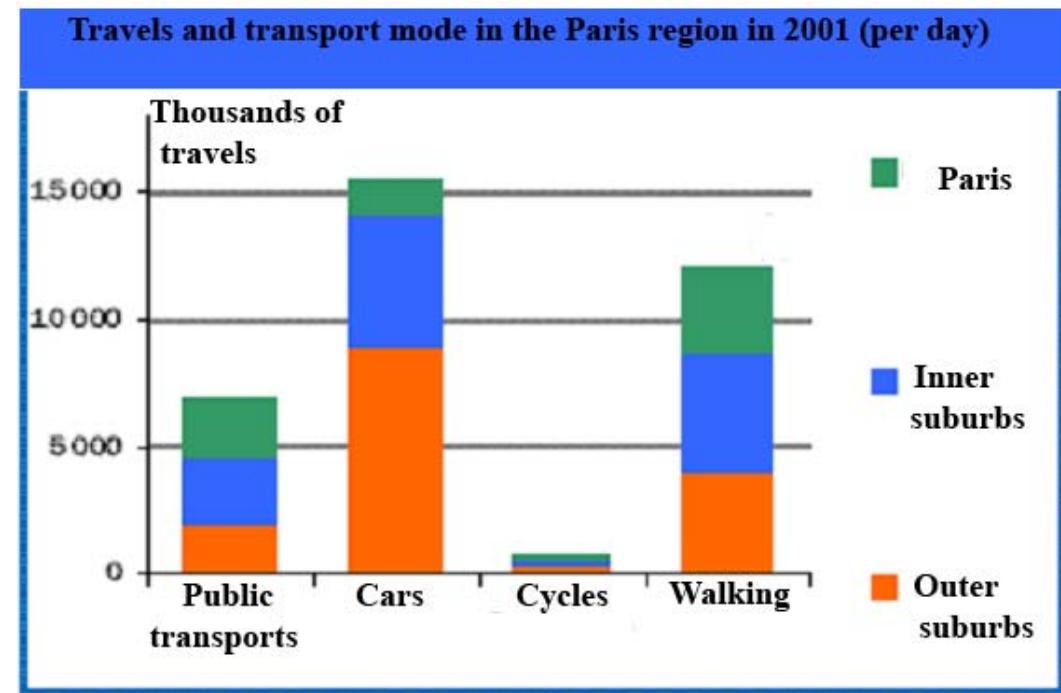
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NUMBER OF TRAVELS

► ***35 million travels per day***

► Transport modes :

- **majority of travels by car**
 - 44 % of travels by car
- **high rate of public transport in the inner city**
 - 32 % of mass transit travels in Paris
 - 20 % in near suburbs
 - 13% in far suburbs

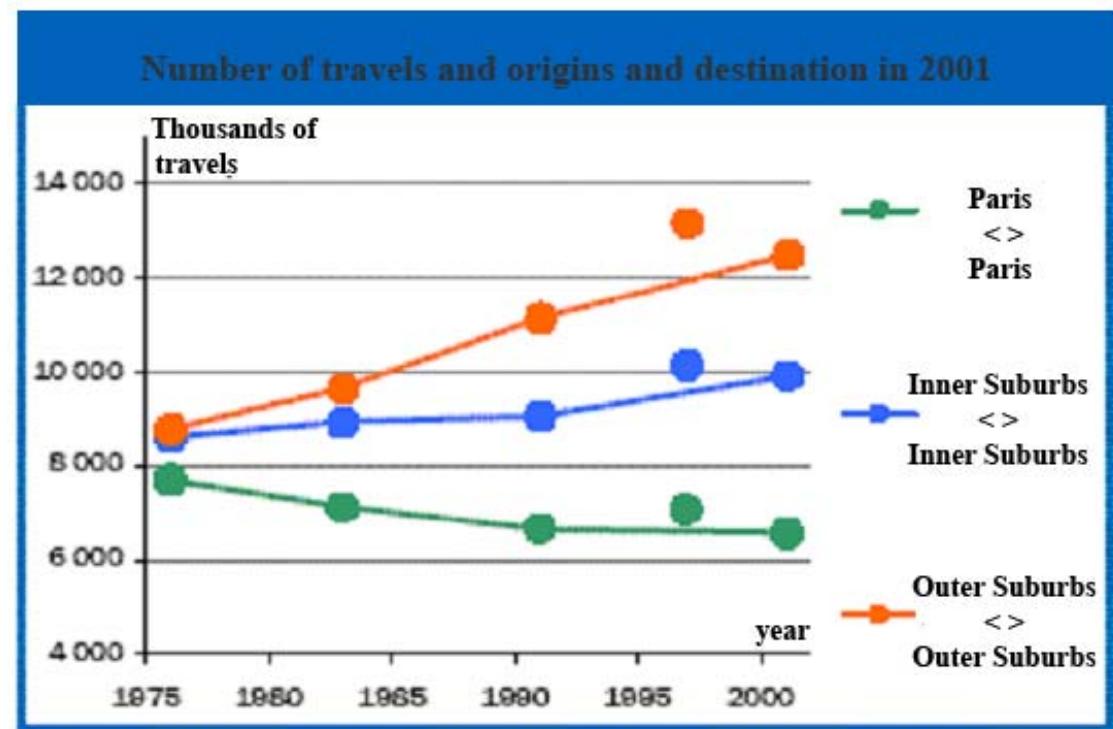


(data EGT 2001-2002)

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GEOGRAPHY OF TRAVELS

- ▶ **Paris conglomeration growth**
 - 50% travels from or to outer suburbs
- ▶ **Very important travel times**
 - 83 minutes per day, about twice the time than in other French cities
- ▶ **“Occupational” travels (work and study) decreased in the last 10 years**
 - 51% in 1991 ; 48% in 2001



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THE TOP 3 TRAFFIC JAMS

► North-east

- A86 A3 A4
- 130,000 vehicles per day
- 550 hour x km congestion (v < 30 km/h)

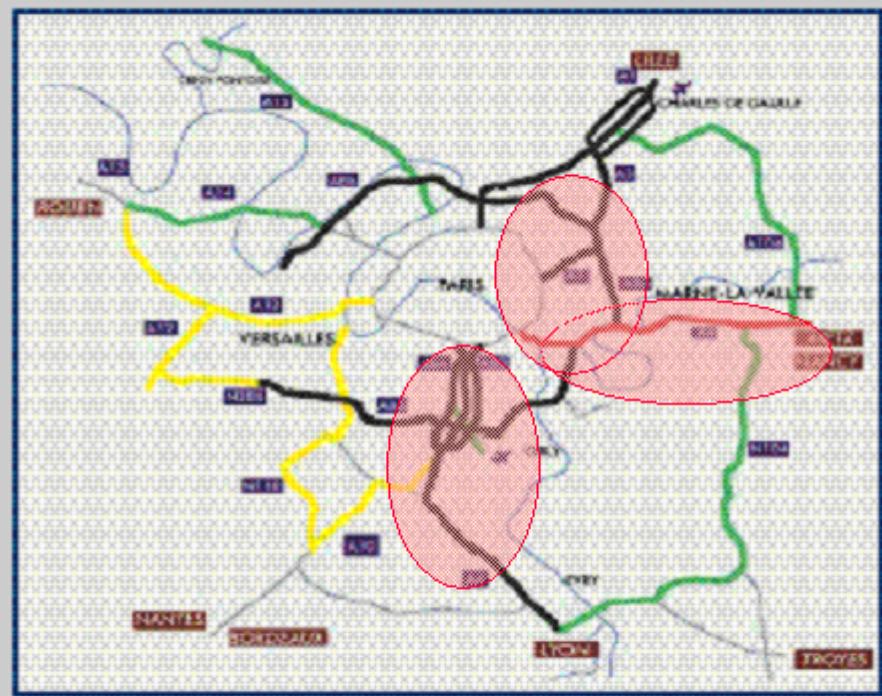
► South

- A6
- 150,000 vehicles per day
- 290 hour x km

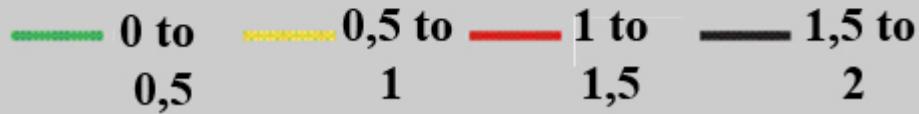
► East

- A4
- 250,000 vehicles per day
- 250 hour x km

CONGESTION BY SECTOR



% rate of total traffic jam / % way length



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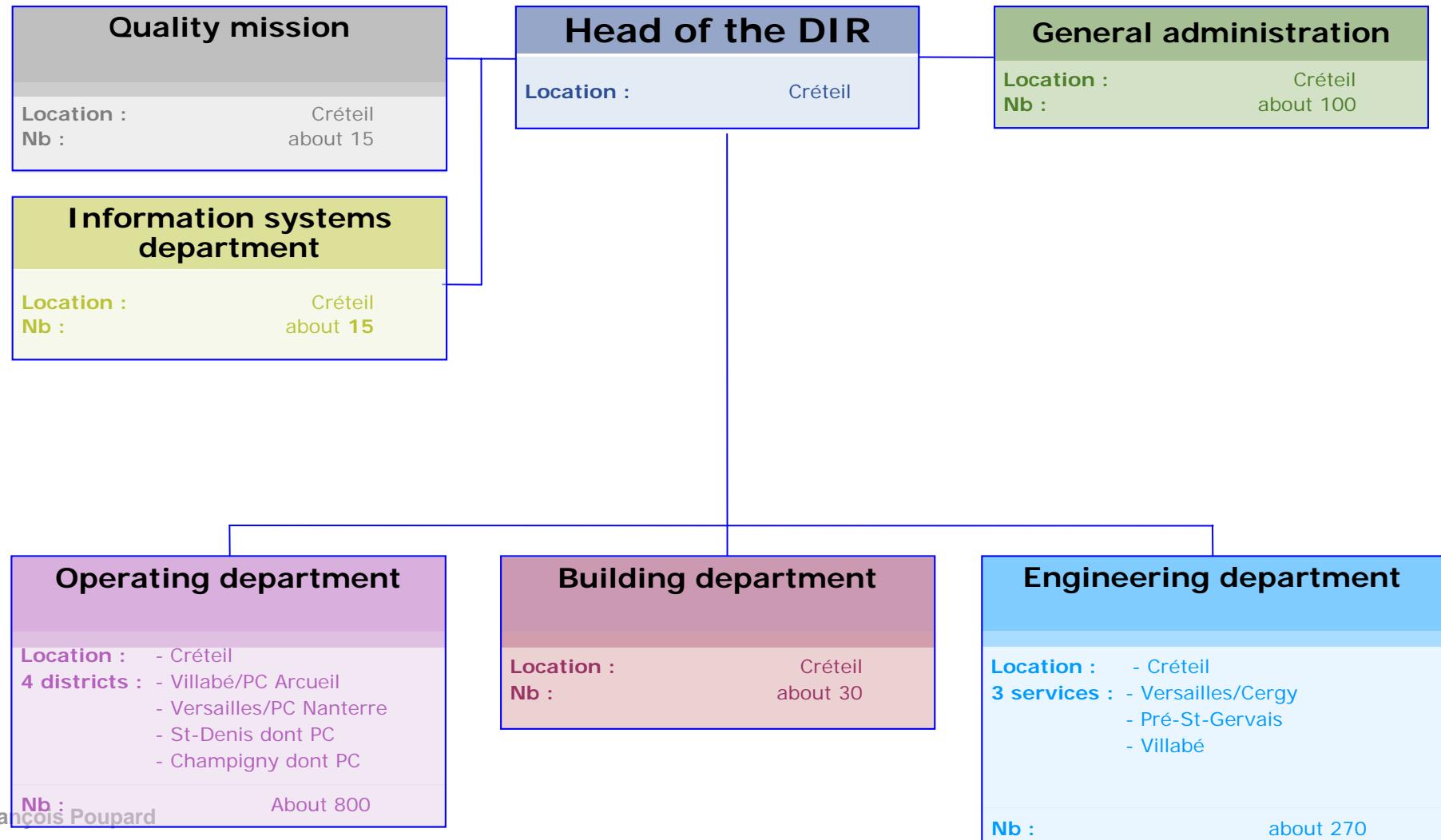
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The DIRIF : a public integrated highway operator



Urban highways in the Paris region

The DIRIF network : State-owned highways

► *An urban network*

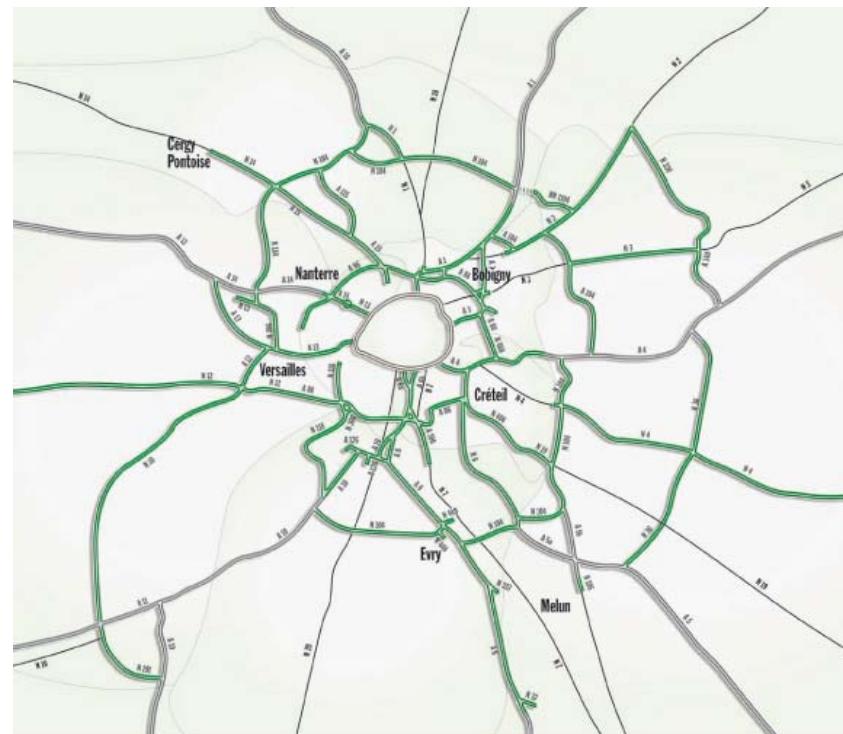
- 450 km of highways
 - 320 km of roads, which the are to become highways

► ***4 million users everyday***

- first operator in the Paris region : RATP and SNCF both carry from 2 to 3 millions
 - 4 to 6 hours congestion per day

► *An intelligent infrastructure*

- SIRIUS
 - Tunnel supervision 24h/7days



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Birth of SIRIUS at the end of the 80s: safety information



- ▶ *Event*



- ▶ *Emergency closure*

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1990s : From emergency management to traffic management

- ▶ 4 million travels everyday on the highways network
- ▶ More than 200 km congestion during 3 or 4 hours, in the morning and in the evening



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Traffic management in the Paris region

- ▶ A very important potential :
 - **650 000 h.km congestion per year**
 - **SIRIUS reduces lost time in congestion by about 20%**
- ▶ which represents about 17 million hours per year
 - **With a rate of 12 €/ h = 200 M€/ year**
 - **Cost of the whole SIRIUS system : 200 M€ maintenance costs : 10 M€/year**
- ▶ Last but not least
 - **Informed users behave more patiently in traffic jams**



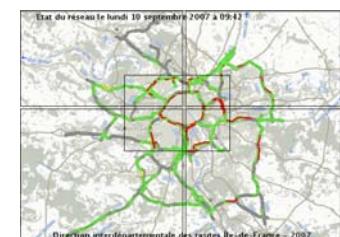
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The SIRIUS system

Data collection



Supervision
and
optimisation

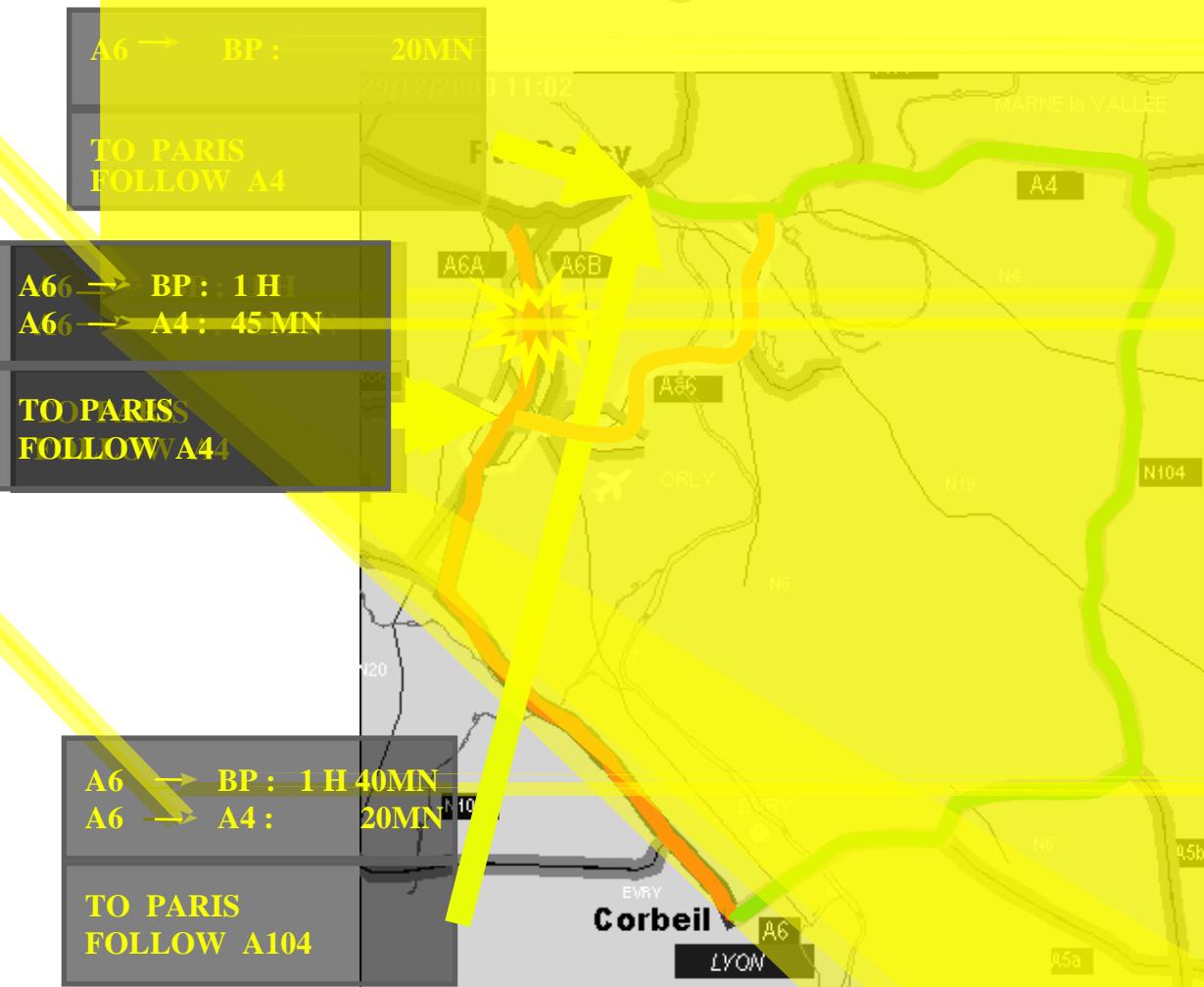
- ▶ 4 headquarters
- ▶ 1 regional centre



Traffic
management

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Traffic management in a network



- ▶ In case of such re-routing, more than 80% of users stay on the highways network
 - Users do believe information and obey !
- ▶ Highway users save about 50% on their travel times (vs road)
 - Less noise pollution for the neighbourhood
 - Time saving for the regional economy

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SIRIUS infrastructure : eyes and ears

- ▶ Data collection
 - **6 000 electro-magnetic loops**
 - **790 cameras**
 - **1 200 emergency phones**
 - **Our own road-side optical fibre**



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SIRIUS 2 : a centralized information system

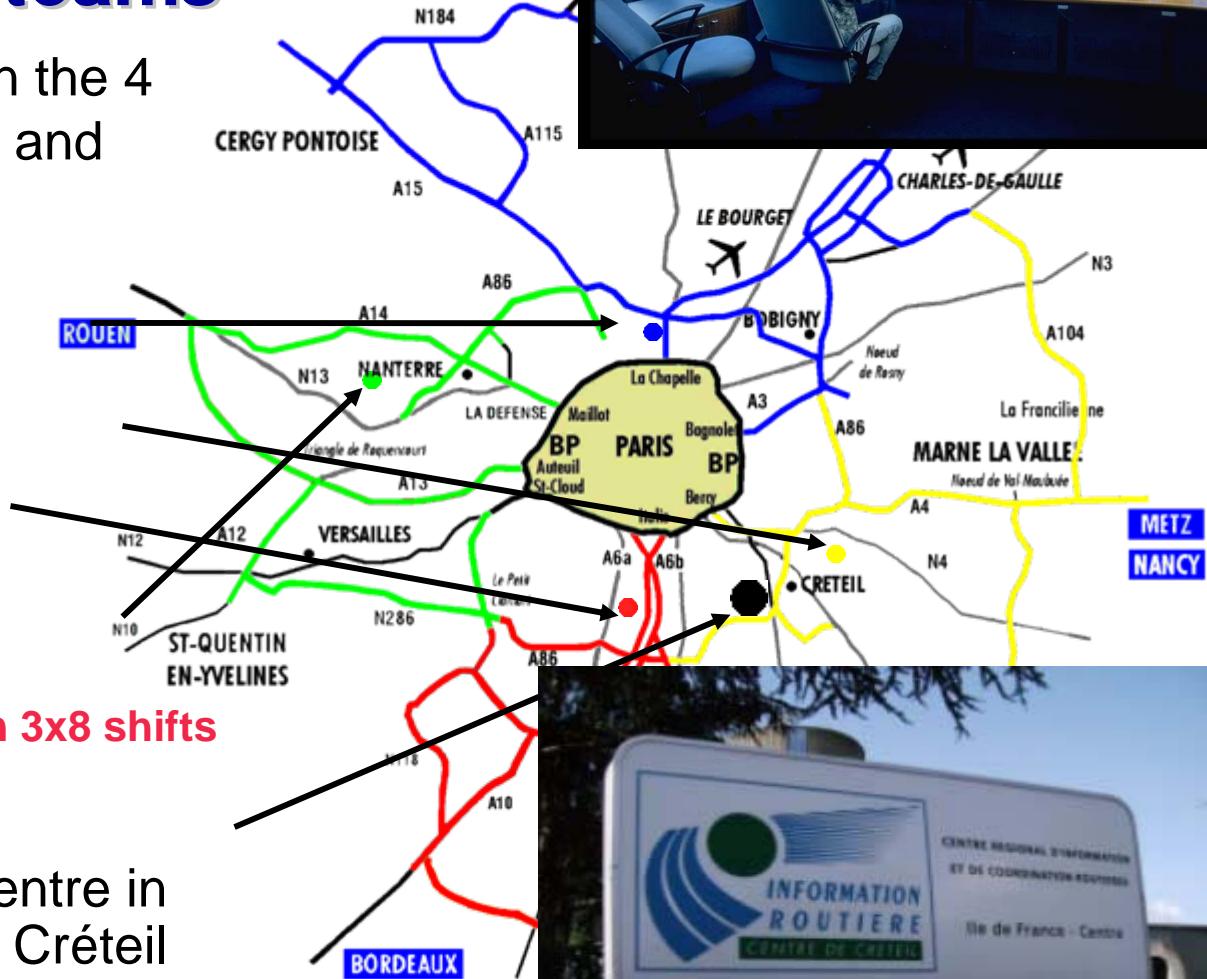
- ▶ *Human organization of traffic management :*
 - The regional coordination Centre : traffic management, diffusion of information to medias – 2x8 shifts - 5 days/ 7
 - 4 headquarters (based in the inner suburbs: Nanterre, St-Denis, Arcueil and Champigny/s/Marne) : safety actions, traffic management – 3x8 shifts, 7days/7
- ▶ *Information system :*
 - 1 regional department : 1 region-wide system with local configurations
 - 1.5 million code lines

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The SIRIUS teams

- Manage information in the 4 SIRIUS headquarters and the regional centre

- North : St Denis
- East : Champigny
- South : Arcueil
- West : Nanterre



The 4 headquarters work in 3x8 shifts

Regional coordination centre in Crétteil

The regional centre works in 2x8 shifts



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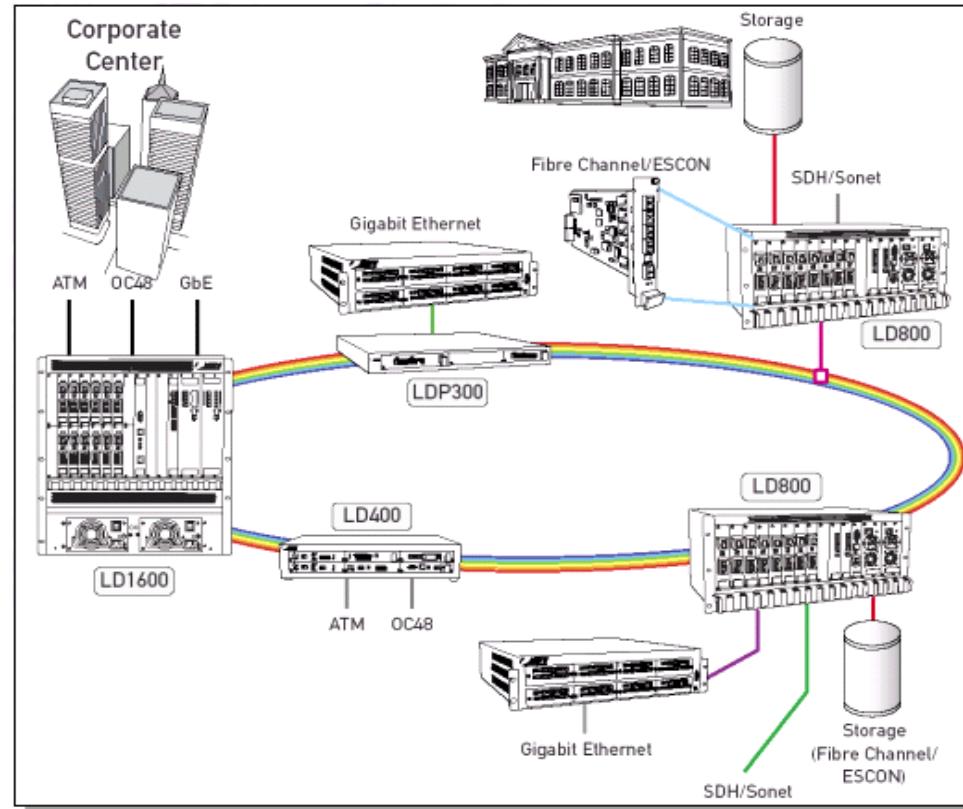
SIRIUS 2 : a centralized information system

■ Reasons for this choice :

- Human organization
- Economy of means
- Traffic management of the whole network
- Using IP technology
- Centralized management of configurations

■ Data volume problem :

- WDM multiplex technology : transportation of both video and IP network on the same fibre



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Diffusion of information

- ▶ Pre Trip
 - SYTADIN
- ▶ www.sytadin.gouv.fr
 - SYTADIN for wap

HTTP://WAP.SYTADIN.GOUV.FR



- ▶ On Trip
 - www.sytadin.gouv.fr
SYTADIN for wap
 - Variable message signs
 - Information center : more than 40 radios



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Different strategies



- ▶ *Travel time*



- ▶ *Event*



- ▶ *Cause*



- ▶ *Traffic management SUMMARY*



- ▶ *Emergency closure*



- ▶ *Re-routing*

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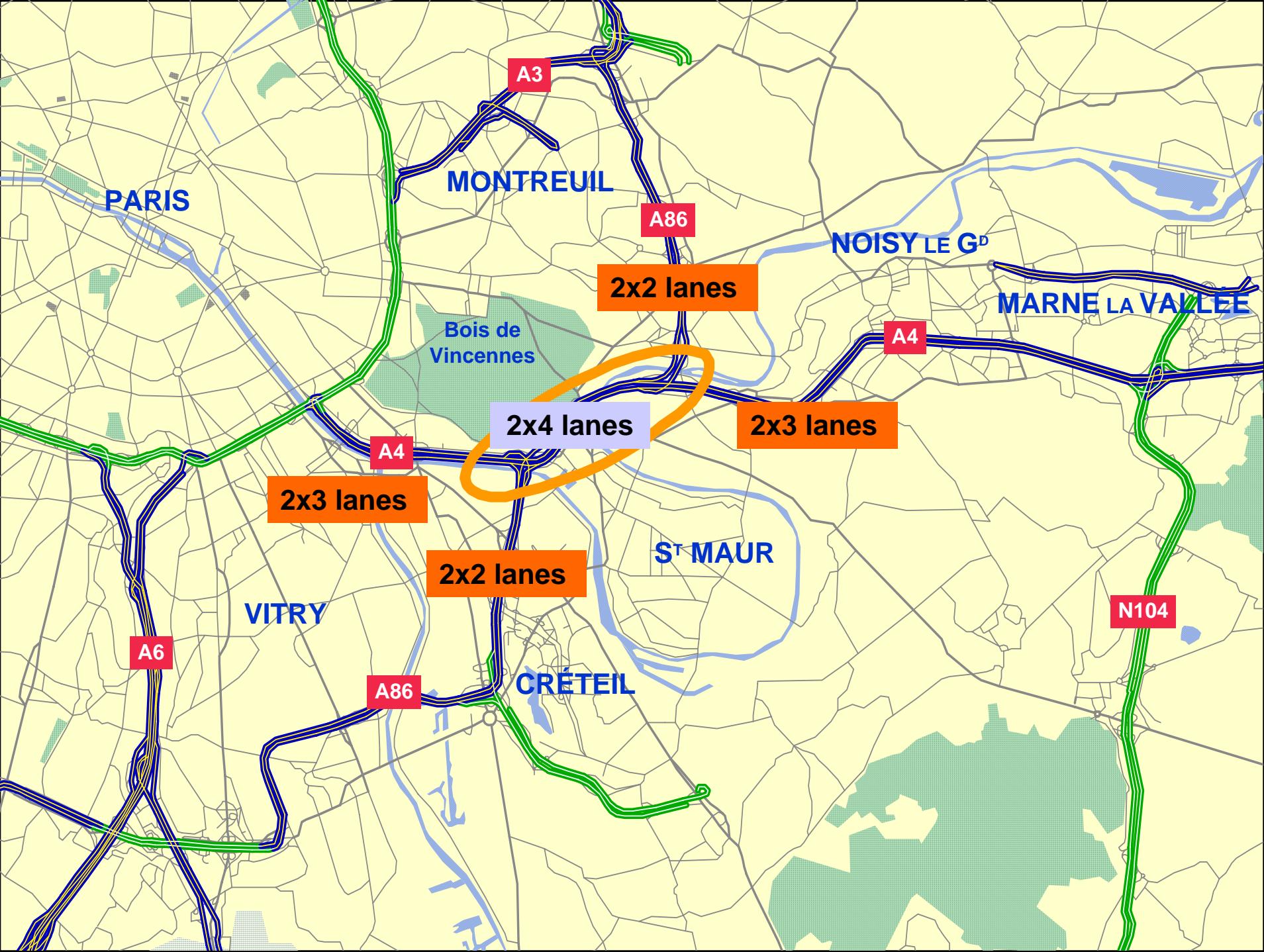
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2000's : new systems

- ▶ Implementing physical actions onto traffic systems
 - Dynamic barriers on the A4 A86 common section
 - Ramp metering
 - Other dynamic systems to be developed





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Goals of dynamic barriers

- ▶ Use the hard shoulder as a normal lane, when the safety conditions are satisfied
- ▶ Make up for the capacity deficit by adding a 5th lane
- ▶ Dynamic barriers, variable message signs (VMSs), centralised management system
- ▶ Cost : 20 M€



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The results

- ▶ Results after one year of operation
 - Operating
 - ✓ Hardware and software : ok
 - ✓ Opening and closure considering a large sector
 - Safety
 - ✓ No increase of the number of accidents
 - ✓ Closure of the barrier behind the Nogent tunnel to ensure that the speed in the tunnel is over 15 km / h

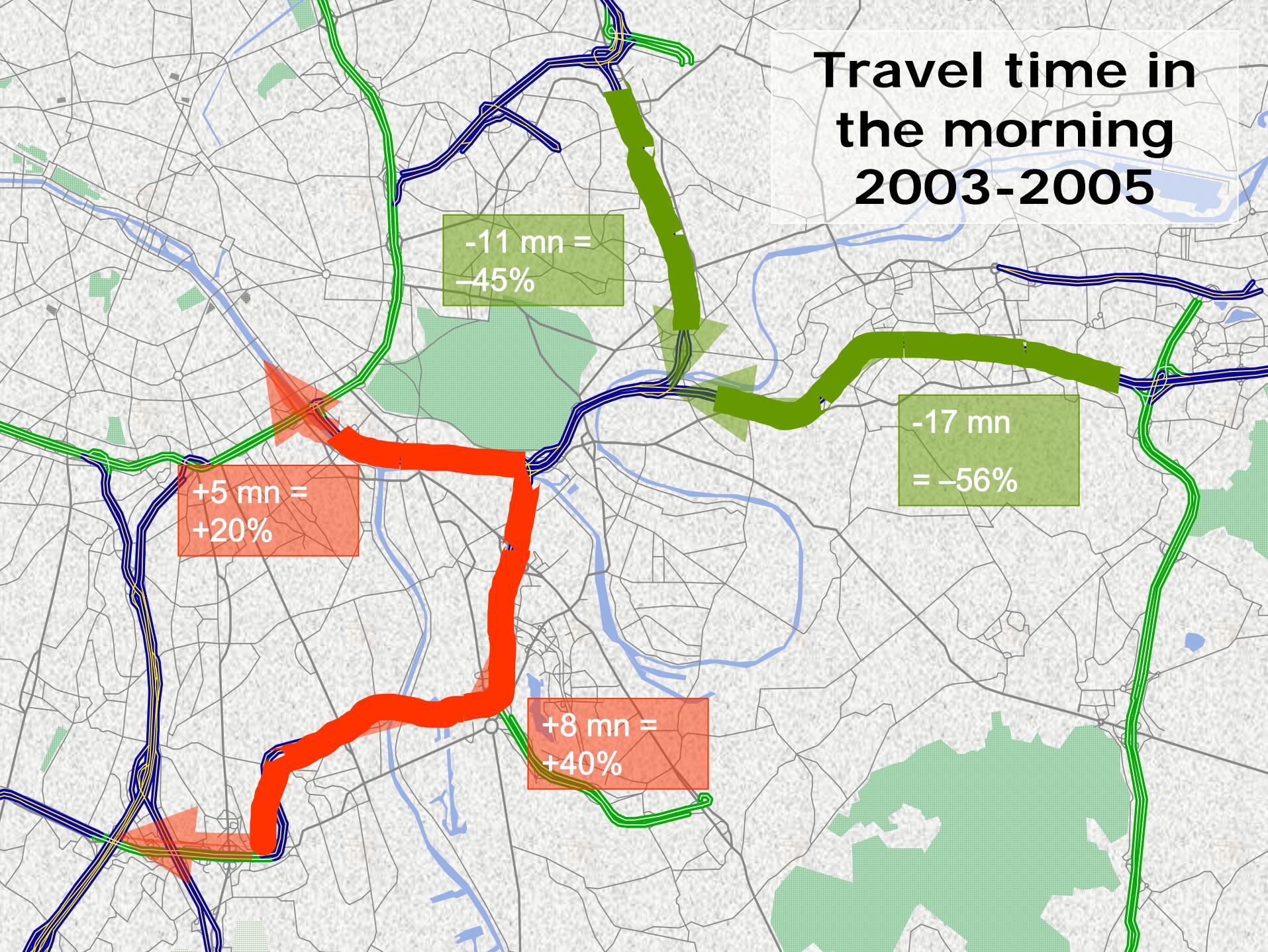


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Impressive results in terms of traffic management

- ▶ *More than 17 mn saved before the tunnel; 8 mn lost after*
- ▶ *Average : 10 mn saved for 10,000 users, during 4 hours in the morning and in the evening*
- ▶ *Average travel time : 40 mn*
- ▶ *25% of travel time saved*

Travel time in the morning 2003-2005



Congestion time 2003-2005

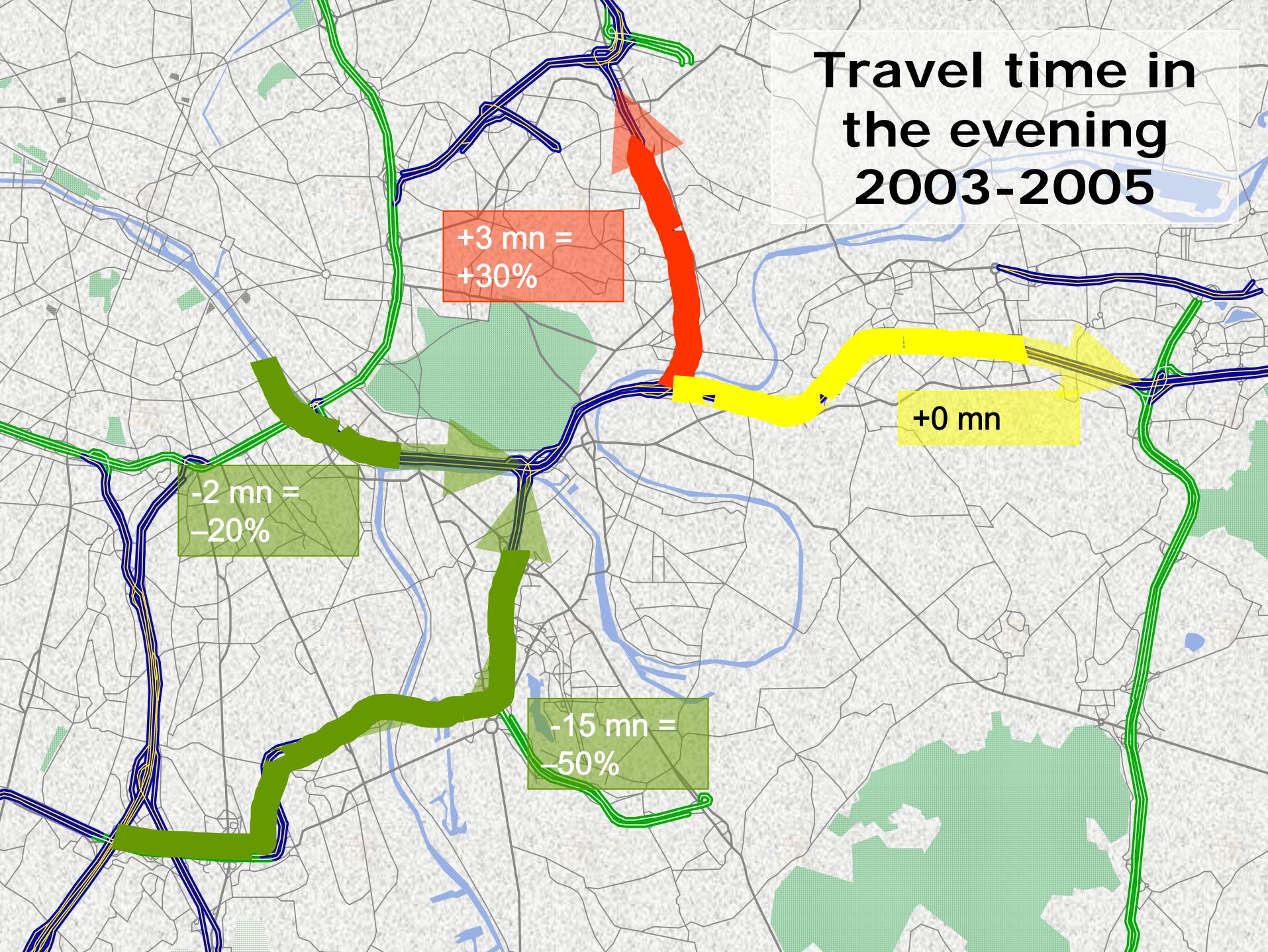
Nogent to Paris : 145
mn → 10 mn
= -135 mn (-93 %)

Bercy to Paris :
94 mn → 155 mn
= +61 mn (+65 %)

Noisy to Paris:
160 mn → 60 mn
= -100 mn (-62 %)

Pompadour to A6 :
59 mn → 108 mn
= +49 mn (+83 %)

Travel time in the evening 2003-2005



Congestion time 2003-2005

Nogent to north : 57 mn →
117 mn
= +60 mn (+105 %)

A4 to east
105 mn → 50 mn
= -55 mn (-52 %)

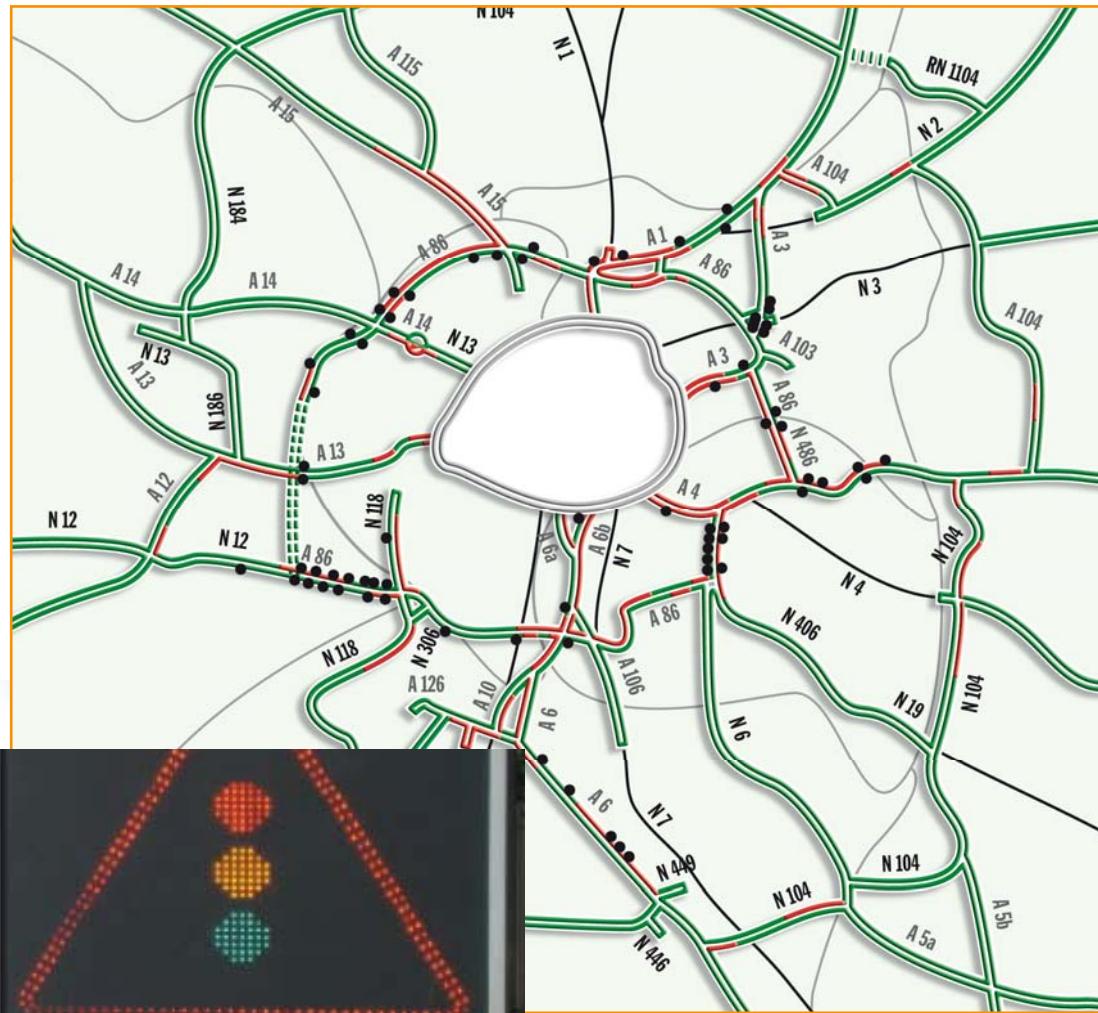
Noisy to east:
0 mn → 0 mn

Créteil to north :
210 mn → 33 mn
= -177 mn (-84 %)

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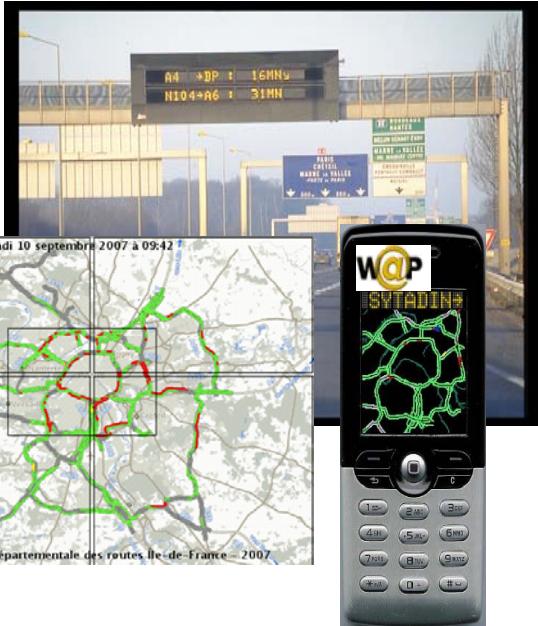
Ramp metering

- Goal : optimise infrastructure capacity
- 80 ramps in the network will be implemented
- An experiment on A6 showed a 10% saving on travel times

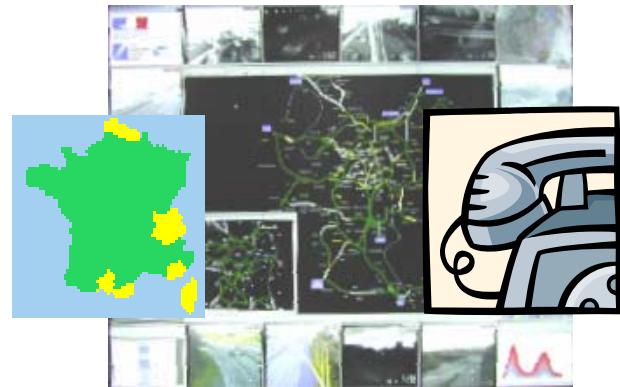


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The crisis management is based on SIRIUS



Data collection, traffic management and information tools : SIRIUS, VMS, Sytadin web site



Crisis monitoring and management tools : regional centre, wall display



Physical traffic management tools : dynamic barriers, ramp metering

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... and the roads information centre

- ▶ 24h/24 organization
 - 36 people
- ▶ Important means
 - Collecting police and SIRIUS data
- ▶ More than 200 messages per day
 - Congestions, incidents, events...
 - 24h/24 information to 40 medias, to keep road users informed several times per hour, at peak hours

Radio France, RMC, RTL, Europe...

- Very good rate of information updates

Ex : City Radio : 6 flashes per hour



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In the next ten years

- ▶ A high quality of service with a complete network
- ▶ A complete interface with the safety systems in tunnels
- ▶ Ramp metering on the urban highways
- ▶ Dynamic barriers at all congestion points and tunnel entrances
- ▶ Integration of the organization with 4 districts, each one including a headquarter and the necessary industrial means (trucks, patrols vehicles...)
- ▶ Links between the patrols and the SIRIUS system in real time



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Thank you for your attention !