I. INTRODUCTION

Mobility management in big cities is a thorny question. Urban populations are growing and are ever more "mobile". Enough to put transport systems under pressure... The major French cities are no exception and today have difficulty in meeting the population's growing mobility needs.

Despite the many existing alternatives, the car remains the favoured means of transport, including for short distances in an urban environment. There are practical solutions for promoting, improving and diversifying the public transport offer. These make it possible to fight road congestion without in any way denying the predominant place of the car in our modes of travel.

For example, the incorporation of digital technologies into modes of transport leads the systems, as well as mobility practices, to evolve by facilitating the move from one mode of transport to another and by optimising all flows in the urban space.
II. OUR VISION OF MOBILITY

The boom in new information and communication technologies outlines a constantly accelerating society where the relationship between time and space is changing at the same time as the behaviour and practices of users.

From soft and eco-mobility (cycling, walking, etc.) to the reasonable usage of of the car (car sharing, car pooling, vehicles as a service, etc.) tomorrow’s urban mobility should necessarily fall within a sustainable development strategy.

Egis, consistent with its development policy and its desire to innovate constantly, sees mobility as a formidable growth driver to dynamise its activities in consulting, engineering, operation and services throughout the world.

Our vision of future mobility and associated services comes in three parts: efficiency, plurality and multi-functionality.

- As it will be **efficient in energy**, resources and space, tomorrow’s mobility will find its rightful place within a future low carbon society.
- As it will be **multi-modal**, it will offer users a wide range of innovative solutions enabling them to optimise their journeys in real time. The emergence of multi-modal hubs, bringing together in one single place different modes of travel (trains, cars, taxis, coaches, buses, cycles), will encourage the use of public transport, recourse to soft mobilities and will give people with reduced mobility even easier access.
- As it will be **multi-functional**, mobility will require towns flexibility for allocation of spaces, depending on the new requirements of citizens in terms of travel.

Mobility is therefore at the heart of a new functional economy, based more on usage than on property. This is why we must now design our modes of transport like services delivery.
III. ACTIVITIES AND KEY FIGURES

Mobility is one of the major challenges of the ecological and energy transition (EET) and presents real opportunities for innovation. The qualitative and quantitative increase in travel, as well as the developments in technologies and usages, force us to rethink the way of approaching the mobility and systems market.

In this framework of the emergence of new trends the Egis group has decided to strengthen its teams devoted to mobility in order to:

1. Strengthen its commitment in the contribution to the **ecological and energy transitions** (EET) for which mobility is one of the major challenges.
2. Seize the **innovation opportunities** (new services to mobility, eco-mobility, etc.)
3. **Rethink the way of approaching the market** for mobility and systems through a more integrated offer with greater added value.

**Digital and smart mobility**

With the digital explosion and the development of the collaborative economy new usages are booming for even smarter mobility. These new solutions, which take advantage of the arrival of digital and rely on the existing transport infrastructures, participate in 2ITS (Intelligent Infrastructures Transportations and Systems) approach.

2ITS facilitates management of networks and traffic, by providing ever increasing assistance to the operator or by providing real time information to users, enabling to manage their journeys better.

Deployment of our solutions is essential for the development of Smart Cities, a new approach to urban management at the service of sustainable development.

Egis supports its customers in their smart mobility projects from upstream studies to the implementation and operation of turnkey solutions, respecting costs, delivery times and the environment.

**Consulting and Engineering**

We position ourselves from the emergence of projects with a vision on the scale of large territories (countries, continents or regions) to support decision-makers in **transport policy and planning**. This makes it possible to support decision-makers at a strategic level.
Once the infrastructure projects have been identified, we provide our expertise in **multi-modal traffic modelling** (road, rail, plane, or boat) to validate its viability.

**Achievements: Infrastructures and Systems Design**

The arrival of the 4th industrial revolution with digital transition and new services, including the Smart City, has forced us to rethink our way of business positioning. We have moved from the technical specifications for standard equipment to the development of global and multi-modal solutions with a services approach.

**Flagship projects 2017**

1. **Supervision centre for road and river canal infrastructures, Perex 4.0, in Wallonia**
   - Studies and design
   - Belgium
2. **Multi-modal National Transport Plan (NTP)**
   - Economy and transport planning
   - Turkey
3. **Master Plan for Urban Traffic Management in Rennes**
   - Assistance in the project management for drawing up Master Plans for Urban Traffic Management
   - France
4. **Intelligent Transport Systems in Wallonia**
   - Setting up an ITS strategy
   - Belgium
5. **Conakry Urban Mobility Plan**
   - Traffic studies and planning for the development of transport networks
   - Guinea
6. **Créteil Multi-modal Hub**
   - Studies of passenger traffic flows in the context of the Grand Paris Express
   - France

**Services to mobility**

We are one of the few world players to offer innovative services to meet the problems of urban mobility. Better use of assets, respecting the environment, is made possible by the diversity of our multi-modal urban services and our innovative solutions.

**700 staff specialising in Mobilities activity**

**More than €80 million turnover in 2017**
The range of services

Since 2006, under the brand Easytrip, Egis has offered a whole range of services to mobility for road users: individuals, professionals and company fleets, and national and international carriers.

Today the offer from Easytrip includes interoperable electronic toll collection services, car park electronic payment services, ferry/piggyback booking services for international travel, access and payment cards for charging electric vehicles, SOS Emergency applications (SOS app).

It is now being progressively extended to embarked services for professional fleets (optimisation of carriers' Total Cost of Ownership, eco-driving, servicing, safety) and to technologies for paperless payments and embarked telematics.

Eventually Easytrip would like to become a key European player in mobility services for road users by supplying its customers with an innovative services package that meets their needs.

Self-service cycle hire

Our BikeU integrated solution for self-service cycle hire (installation, operation and maintenance), developed in Poland, is based on:

- The deployment of bicycles and stations (hardware + software)
- A website and a dedicated mobile application for information, stations availability and payment
- Information in real time that can be consulted by Smartphone giving the availability of a bicycle in each stand and the possibilities for returning it (place available)
- An Operation section: customer back-office, fleet maintenance and balancing of the load between stations
- Report for the local authorities

Main results:

Egis is ranked 2nd in Poland for self-service cycle hire in 4 cities: Szczecin, Bydgoszcz, Krakow and Bielsko-Biala
Smart parking

Integrated solution of the on-street parking device

Main advantages

- Enforcement’s Optimisation: savings in time & money for the local authority (1250 cars checked/hour as opposed to 70 by a parking agent on foot)
- Reliability of this paperless service
- Management of the whole process: information, payment, enforcement, penalties follow up
- Town centre shops more attractive
- Data usage concerning parking users

Congestion charging

In the context of setting up congestion charging at the access points to a city, we offer an integrated solution for payment without stopping (free-flow tolling) and the control, or even the reporting of offending vehicles:

- Delivery of the on-street system and control room
- Registration and management of users
- Control of payments and detection of offenders
- Sending of demands for payment, or tickets or management of claims
- Reports to authorities

Main results

- Two main accesses (bridges) managed in Vancouver, Canada: Port Mann Bridge from 2012 to 2017 and Golden Ears Bridge from 2009 to 2017. 150,000 vehicles per day.
- On one of the bridges there are 2 lanes dedicated to car pooling and 1 wide lane for cyclists and pedestrians.
- Very high user satisfaction level (90% on average)
- Egis has received the award for the best service centre for 6 years in a row
Our innovation themes in mobility

Our aim: to design, build, and operate sustainable infrastructures and to imagine new services for connected “seamless travel”.

- **Agile, economical solutions for the operation and maintenance of infrastructures** (smart sensors, user information solution, mobile apps, connected vehicles, etc.) which we offer to our customers, public or private road infrastructure operators.
- **MaaS (Mobility as a Service)** through the services offered to the driver, solutions to facilitate his “door to door” journey: extension of the Easytrip services package to new mobility modes, such as community use of the car, car pooling, car sharing, etc.
- **Connected infrastructures**, particularly the interactive road: use of data from connected vehicles for new services for network managers, provision of the digital model to improve driving in autonomous vehicles, incorporation of autonomous shuttles into traffic management systems, etc.
- **Cybersecurity** for transport (stations, air terminals, platforms, lines which can be targeted), security of sensitive infrastructures using digital in the context of our systems engineering assignments.
- **Electromobility**, whether in the context of public transport projects or in the offer of service to drivers and operators of charging points for electric vehicles
- **Alternative energies** for public transport in order to achieve “zero emissions”.

On the latter two subjects, in the context of Lab CDC (incubator for Caisse des Dépôts) and in partnership with the Dutch subsidiary of TRANSDEV, Egis has developed a real toolbox making it possible to offer cities and operators different solutions adapted to the local situation for moving vehicle fleets to low carbon energies.
IV. Focus on Solutions to Fight Congestion

Congestion, a sad reality

135 hours lost on average per year per driver

17 billion Euros lost in 2013 (fuel, early wear of cars, working hours lost, etc.)

+13% of greenhouse gas emissions linked to jams by 2030 (Inrix study)

A growing impact

Environmental

+13% greenhouse gas emissions linked to jams by 2030 in France (1)

6 months life expectancy less in 30 years’ time due to fine particles (2)

Financial (1)

€1943/year per household of expenditure linked to traffic jams

€1943/year per household of expenditure linked to traffic jams

€22 billion: lost growth (GDP) forecast in 2030
Congestion is the fruit of a temporary imbalance between the automobile demand and the road network offer. Either the offer is lower than the demand: this is the case when an accident temporarily reduces the roads available. Or the demand is higher than the offer: these are sadly the famous “rush hours” on weekdays on expressways.

Luckily, the world has solutions for fighting this phenomenon. Infrastructures, technologies and new services to mobility could soon be a game-changer. This is an overview of the answers that the Egis teams are able to provide to this problem which is well known to the authorities.

MORE LANES...

Widen the carriageway

Faced with traffic saturation the standard solution involves widening the carriageway in order to increase the infrastructure's capacity.

Sources:
(1) INRIX study dated 14 October 2014
(2) Aphekom study
Are there other solutions?

However, as the traffic space cannot be extended forever and requirements become greater, this solution is no longer viable long-term. In France, as elsewhere, the concept of dynamic lane management opens up new perspectives. The principle is to manage and optimise road traffic in a variable manner, in time and in space.

In French this is generally known as GDV (Gestion Dynamique des Voies) and in English ATM (Advanced Traffic Management, or Active Traffic Management) or even “managed lanes”.

Commuter traffic

The commuter journey is the daily journey made by the population of large urban centres between home and work or school.

This phenomenon is typical of the dissociation between business areas (city centre, business parks) and the housing areas on the periphery (suburbs and outlying suburbs).

This type of mobility causes many problems for managing means of transport and communication routes at the morning and evening rush hours.

The very heavy commuter traffic, as these graphs for the Saint-Nazaire Bridge (Egis study) show, encourages the consideration of reversible lanes.

Difficult journey times

- Fluid regime: 4' for the crossing
- Saturated regime: could take up to nearly 30’
Some examples

Saint-Nazaire

The Saint-Nazaire Bridge is a 3-lane bridge straddling the Loire estuary downstream from Nantes. It takes 31,500 vehicles on average per day. Due to the many home - work journeys, traffic jams are very frequent morning and evening. The crossing time can be up to 30 mins, whereas it is barely 5 mins at off-peak times.

With the assistance of Egis, the Loire-Atlantique Regional Council has therefore put into service an operating system that is very innovative in France. It involves changing the traffic direction of the central lane of the bridge depending on traffic needs. In the morning it is therefore reserved for traffic in the direction Saint Brévin - Saint-Nazaire, and in the evening the direction is reversed.

Dynamic road signs and automatic filter pillars, placed upstream of the dynamic lane, indicate to users the lanes they must take. Luminous ground markings complete the tool.

The red luminous inset lights, from Saint-Nazaire, are the subject of a study at CEREMA to be considered as red lights on the ground and therefore they cannot be crossed. This eventuality, which will soon be in the French Highway Code, will make it possible to design the infrastructures as required.

Very positive results

“The dynamic allocation system has made it possible to optimise traffic management and provide very good traffic fluidity. The crossing time has become very regular, between 4 and 6 minutes, instead of 8 to 20 minutes previously. The tool is also very secure with a radar section calculating the average authorised speed at 70 km/h over 4 km. The long-term fuel savings and the reduction in CO₂ emissions into the atmosphere are also appreciable gains. Finally, users seem to be very satisfied with the tool which does not appear to pose them problems with understanding.“ — Bruno Caillabet, Travel Director at the Loire-Atlantique Regional Council.

La Réunion

In La Réunion, the switch-over is carried out by a machine which places mobile concrete barriers. Safety is of prime importance. Effectively these mobile barriers have the advantage of guarding against front impacts. And we are still taking the approach “in the morning 2 lanes towards Saint-Denis and in the evening 2 lanes towards La Possession”. Here we are on a large 12-km linear stretch with 2 machines which operate in normal road operation at a speed of 6 km/h.
Guadeloupe

A purely capacitative approach

In this case the approach is simple: find an additional lane in the same direction for all types of vehicle. To do this on a 3-lane carriageway, we mark out the 3 lanes by continuous white lines and allocate the third lane according to the time of day.

Ile-de-France

The A4 and A86 motorways are infrastructures with very high road traffic flows in the Paris region. In addition, in the Val-de-Marne Department, these two motorways overlap each other over a section of about 2 km. The result is significant congestion, particularly during morning and evening rush hours.

Egis has conducted a Project Management assignment to carry out an experiment in the field, This involves using the hard shoulder in the rush hour as an additional lane for both traffic directions depending on traffic demands. So this measure has been operational in the morning rush hours in the direction of the provinces - Paris, and in the evening rush hour in the direction of Paris - provinces during the experimental period. At off-peak times this lane becomes the hard shoulder of the motorway again and is therefore prohibited to traffic.

Travel authorisation or prohibition is therefore physically materialised by the deployment or folding of mobile restraint systems, known as GMA (Glissières Mobiles d’Affectation - Mobile allocation barriers). When they are deployed these barriers are an obstacle on the auxiliary lane. When folded, the auxiliary lane is free.
Multi-modal sharing of motorways and expressways in Île-de-France

To reduce and make journey times for users reliable and enable them to cross the worst congestion the Région Île-de-France, Île-de-France Mobilités (formerly STIF) and the Government have decided on multi-modal sharing of motorways and expressways in the Francilien region.

The objective? To improve bus line travel conditions, which could even be open to taxis and car pooling, in order to optimise the service to the user over 11 routes in Île-de-France.

This assignment with three key objectives was entrusted to Egis: identify and rank the relevant corridors for the development of dedicated bus lanes, correlate these solutions with existing regulations (which must evolve if applicable) and check the feasibility of the solutions in the field.

A first in France!

✓ Exceptional scale of the analysis conducted: 800 highly interactive meshed network
✓ Double consideration conducted on both infrastructures and user requirements
✓ The exhaustive exploration of all the themes: technological aspects (engineering structures, carriageways) regulations (Highway Code, methodological guides from CEREMA*), traffic, systems, road safety, intermodality, opening of dedicated lanes to taxis, car pooling, motorcycles.

* Centre d’études et d’expertise sur les risques, l’environnement, la mobilité et l’aménagement - Centre of studies and expertise on risks, environment, mobility and development
ACCESS REGULATION FOR EXPRESSWAYS

So as not to increase the number of vehicles during periods of congestion, we allow vehicles to enter by drip-feed with an algorithm which drives the traffic lights at the entrance to these expressways.

This system is now in place in Grenoble, Lille and in Île-de-France. Many conurbations are interested in it, though with the problem of holding back the queue which sometimes overflows into the municipalities adjacent to the expressway.

REVERSE TOLLING, TO SMOOTH ROAD TRAFFIC PEAKS

This is a system which rewards road users when they avoid travelling in rush hour. It allows more fluid traffic and more eco-responsible behaviour from road users.

Once a user reorganises his travel habits, he gains in quality of life. Reverse tolling are a real help for changing behaviour and make it possible to reduce journeys by 8% on average. A figure given following programmes already in place in Dutch cities. These programmes are managed by the Egis subsidiary, BNV Mobility, based in The Netherlands.

It is a solution which is incorporated into the implementation of the Group’s ecological transition strategy.
The tool

The Netherlands

Initially the solution was an experiment in The Netherlands (more than 10 programmes). This is a country with one of the highest population densities in Europe and offers free travel on all its road links. In this context the challenge was to offer solutions to reduce traffic at rush hours in the large Dutch cities, without installing additional infrastructures.

The objective by 2015 was to reduce congestion by 20% with 300 concrete, coordinated and quantifiable measures.

Conclusive results

- 6% traffic in Rotterdam thanks to 12,000 participants over a period of a year (5000 avoidances carried out per day)

- 40% daily participation

- 85% of participants have changed their habits sustainably after the end of the programme

At the end of the programme 85% of participants retained their good new travel habits. Not only did they realise the benefits of no longer finding themselves in traffic jams morning and evening, but they also acquired a true environmental conscience. This makes reverse tolling a solution that is as effective as it is sustainable.
The concept adapted to the French situation: the example of Lille

In order to decongest the entrance to the Lille area and fight pollution, the European Lille Metropole urban area has tested an innovative project: the mobility eco-bonus, which takes its inspiration from the “reverse toll” concept set up in Rotterdam by Egis. Once again, for every car journey avoided in rush hours, users are rewarded financially with several Euros, either in cash or to be used to buy a public transport ticket. The voluntary participants subscribe to the programme for 9 months, beyond which their new habits continue.

Chasseur de Bouchons (Traffic Jam Hunter) experiment in Boulogne-Billancourt

At the end of June 2016 the “Société du Grand Paris” in partnership with STIF launched an experimental programme on the subject of mobility. The purpose was to provide innovative, concrete answers to one of the major problems for users: traffic and parking during the works on the “Grand Paris Express” project until 2030.

With its “Chasseur de Bouchons” (congestion hunter) solution Egis won this call for innovation solutions. After a recruitment phase with the local companies in Boulogne-Billancout, the participants had to avoid the trapezoidal area of Boulogne, located between the “Pont de Sèvres” and the “Pont Renault”.

ORGANIZATION OF THE EXPERIMENT

1. Recruitment
   - Presentation of the project to employers in the zone
   - Sending of an email inviting staff to participate
   - Online, answers to a questionnaire confirming candidate eligibility

2. Test week
   - Sending a box to the home of the participant
   - Connection of the box in the vehicle
   - One week when the participant must not change his habits

3. Reward
   - Points gained for each journey avoided for 4 weeks
   - End of the experiment initially planned on 15 June
   - Allocation of rewards after fraud control

“Le Monde” Smart-Cities Global Innovation Award 2016

Egis received two distinctions for the regulation of traffic peak hours, an innovative solution for responsible drivers.

Car pooling

Today road managers no longer talk about the number of vehicles in circulation but rather the number of people transported. In fact, commuter journeys are often undertaken in vehicles which carry 1.1 to 1.2 people on average.

If we manage to encourage car pooling and increase the number of passengers per vehicle, we reduce the number of cars on the road.

So urban areas and cities must offer solutions to encourage car pooling, and some are starting to offer a special car pooling lane to provide fluid journeys to those who make the effort to have more than one person in the car. This encourages the sharing of a vehicle to reduce congestion on the motorway and urban expressways.

Car pooling parks are also developing in Lyon and La Rochelle in particular, where studies are ongoing.

ITS strategy in Wallonia

What will tomorrow’s mobilities be?
Press Release – 2018 - Egis
Important work has been carried out by Egis and its partners in Wallonia to define the operation of all roads and motorways there. Very special attention has been paid to future innovations in the field of ITS, in particular:

- Knowledge of events via certain social networks
- Overflying some areas with drones
- Incorporation of eCall (“emergency call”)
- Creation of corridors of connected vehicles
- Incorporation of the C-roads European think-tanks
- Counting of HGV spaces available in parking areas
- Dedicated application for motorways in Wallonia on Smartphone
- Import of FCD and FMD (Floating Car Data, Floating Mobile Data) data into the future SAGT (Système d’Aide à la Gestion de Trafic - Traffic Management Assistance System)
- Putting the car pooling lanes in place.

REINVENTING OUR DRIVING

Lower speed for more fluid roads

Contrary to what one might think, higher speed does not always make it possible to carry more cars on a section. In fact, if the number of vehicles increases, high speed becomes a problem. The safety distances are no longer sufficient, the slower vehicles disrupt the flow, lane changes by some vehicles force other drivers to reduce their speed suddenly. Then a “concertina” flow builds up, or even a jam pure and simple.

Conversely, adapting speed enables road capacity to be increased. In fact, a lower speed on a motorway or expressway is a good means of reducing inter-vehicle distance and therefore limiting concertina congestion. Very many dynamic speed regulation experiments have been performed by Egis in France and Europe, particularly in Great Britain on the M25 London ring road, managed jointly by Egis and its British partners (Balfour Beatty and Atkins).
Known as the London Orbital, the M25 is the circular motorway round Greater London characterised by many intersections. With its 188 km it is the second longest ring road in Europe after the one in Berlin (196 km). It is also the busiest road in the United Kingdom.

The M25 was the first British motorway to experiment with speed regulation in 1995, and then with the national “Smart Motorway” programme (£6 million) launched in 2014 by the British government. At present the second longest ring road in Europe is fully fitted with dynamic signs to regulate speeds, as well as cameras to control the 200,000 vehicles/day on the sections with the heaviest traffic.

**Avoid the annoyance caused by HGVs**

The overtaking ban applied to HGVs put in place on distances of several kilometres are part of the measures for operation and regulation of existing traffic, which were proposed at the end of the public debate on transport policy in the Rhone Valley and the Languedoc Bow. As such it is one of the priority avenues of discussion to improve the cohabitation of heavy goods and light vehicles on the routes with heavy traffic on the national road network, especially the 2x2 roads in interurban areas.

**THE CARRIAGEWAY, A SPACE TO BE SHARED**

**Encourage public transport**

Here the aim is to encourage one mode in particular, making sure that public transport is not stuck in congestion. There are two possibilities for this:

- The most widespread involves using the hard shoulder for public transport and only when congestion starts to build up. This approach is totally different from the creation of a separate bus lane because we still have the potential of using the hard shoulder at other times.

- The other possibility is to remove one lane of the existing carriageway. This does not sort out the problem of congestion for vehicles. Quite the contrary, but it at least enables public transport to have a fluid trajectory (either buses or taxis).

**Dynamic bus corridors in Lyon**
For three months in 2017 a transitory bus corridor was the subject of an experiment by the Metropolis of Lyons and the Egis teams over about 600 metres. The principle is simple: it involves temporarily allocating a general traffic lane to buses. Therefore the traffic is no longer penalised in favour of the bus constantly over several kilometres, but just for a few minutes. This allocation is operated dynamically, using luminous filter signs and LED marking on the ground, to display the status of the reserved lane in real time. So, as soon as the lane is dedicated to buses, the corridor is “enshrined” and cars are invited not to cross into it.

This device is a real alternative to the permanent separate lane. The intermittent bus corridor makes it possible over time to limit the right of way for public transport in the lane and therefore not reduce the capacity of the lane to other users forever. So the traffic can continue to flow, the image and efficiency of public transport is promoted and drivers accept it more easily. In this way by optimising space the dynamic bus corridor could revolutionise the urban approach to separate lanes, which is frequently a source of conflict between drivers and public transport. Furthermore, its ability to be replicated would encourage optimisation of transport infrastructures to limit congestion in the urban environment on other sites.

The contributions of the solution tested are many:

- **Attractiveness of public transport**: better management of crossroads with traffic lights for buses leads to improvement in the regularity of public transport, its commercial speed and, as a result, its attractiveness.
- **Efficiency of the mobility ecosystem**: by proposing optimisation of the public space, this solution enables shared, intelligent use of the carriageway between all modes of transport.
- **Economic**: this solution makes it possible to avoid putting in place long stretches of bus corridors when the problem often lies in crossing junctions with traffic lights.
Evidence from Pierre Soulard, Urban Mobility Service Manager at the Metropolis of Lyons Roads Department

“The experiment has shown proven time savings, but especially unexpected gains in regularity. Moreover, this shows the specific application conditions. The Metropolis of Lyons brought this subject to the attention of the Mobility Conference, not just to facilitate this type of experiment but also to develop regulations and allow this type of dynamic space sharing in the French Highway Code, and also in the ISRR (Instruction interministérielle sur la signalisation routière - Interministerial Instruction on Road Signage).

In this particular case, the Metropolis’ interest was to find innovative solutions to space sharing to improve the performance, and therefore the attractiveness, of public transport. This project was conducted in a context of progressive transition from mainly individual motorised travel to more sustainable travel. When 90% of journeys take place in the public space the roads are areas of excellent intermodality and multi-modality. The geometric distribution of spaces is no longer enough and the operating conditions must pursue more balanced sharing that is more favourable to alternative modes.”
The Quai Deschamps in Bordeaux

Bordeaux metropolis wishes to regain its urban space, restore living space to its citizens and to develop towards reasoned mobility, which is more fluid and more efficient. This policy has led to the creation of the Parc aux Angéliques along the Quai Deschamps. However, the functional condition of the road is not suitable for this new development.

In the beginning, the Quai had a 2x2 traffic lane configuration (bus lane in each direction), no parking and very limited pedestrian traffic due to vehicles encroaching on the pavements.

To meet the metropolis’ challenges without damage to the service level, Egis and Axium proposed a solution of dynamic allocation of the urban space. With the “shared Quai” Bordeaux now has 3 traffic lanes, the use of which varies throughout the day. The results are real commuter traffic for buses, parking possible all along the Quai and the recovery of pedestrian space.

In the morning rush hour 2 lanes are allocated in the “entry” direction to the city, one is devoted to buses and cycles and the other to general traffic; the third lane is for the other travel direction. In the evening rush hour the reverse is true.

At off-peak times when there is less traffic, the central lane is taken out of service, restoring a convivial, “ventilated” space continuing on from the Parc aux Angéliques.
How can the allocation of lanes be arbitrated?

“Full matrix” diode panels installed at the access to the Quai and repeated at fixed intervals, indicate the allocation of each traffic lane in real time (“all modes” or “bus +cycles” or “closed”).

Permanent marking (T3-5U) is compliant with the standard for marking out a bus lane. Marking on the ground (red diode beacons) completes this tool for marking out the traffic lanes.

BETTER TRAFFIC MANAGEMENT

The roads in Guadeloupe under control with Trafikera

The Trafikera dynamic traffic management and road operation system is unique in the Caribbean. It ensures that the time lost in traffic jams is reduced as is the environmental impact linked to journeys. It was set up by Egis in August 2013 on a portion of the road network in Guadeloupe and it is intended that it will be extended over the whole island.

Evidence from Jean-Gabriel Quillin,
Managing Director of Routes de Guadeloupe

“On an island you can’t increase the number of roads ad infinitum. We have therefore opted for this system which manages traffic in real time, depending on what is happening. The strength of Trafikera is the ability to take immediate measures due to the cameras, counters and carriageway analysers. With this system it is possible to balance and regulate traffic levels on the whole of the existing network. Trafikera is a complete system, configured to cope with 17 types of event having effects on traffic. With the integration of all the information, operation and intervention procedures, we save precious minutes. Previously the qualification of an incident on some routes took at least 20 minutes, the time required to completely paralyse the centre of the conurbation. From now on, with Trafikera this time will be in the order of 2 minutes, which will enable us to take the necessary measures right away. The average duration of these disruptions have therefore been reduced significantly. “

PEREX 4.0 Centre in Wallonia

The region of Wallonia wished to develop a “smart networks” concept that is able to manage the road and river infrastructures in real time from a new centre. This project was achieved in a modern effective way in terms of mobility, safety and the environment.

The Egis teams provided the project management. Using functional analysis their task was, in particular, to make the new centre as “high tech” as possible as far as the management of road and river infrastructures in Wallonia is concerned. The future centre must allow not only optimal
management of road and river traffic but also better management of information to the user (miscellaneous events, condition of infrastructures, etc).

Moovia®, a new brand devoted to the control of on-street parking

Egis and Transdev have created Moovia®, a new benchmark brand which, since January 2018 and for the next 6 years, is providing the control of more than 115,000 on-street parking spaces in six Paris arrondissemements and in ten other cities in France including Bordeaux and Nice. Egis supplies the systems and back-office operations necessary for parking control. Today Egis is one of the leaders in parking in France (and in Europe).

Parking control in Paris

From 1 January 2018 the consortium, made up of Urbis Park Services, Transdev and Egis, manages the system for controlling paid parking in the 8th, 9th, 10th, 17th, 18th and 19th arrondissemements, representing more than 43,000 parking places.

Egis was responsible for setting up the IT platform and the claim management services. It is also the partner holding 30% of the project company. With this new contract, and following the success of the Amsterdam project, Egis has become one of the leading operators managing the control of paid on-street parking in Europe, and is therefore involved in an ambitious development of the smart parking market in France.

Effectively fighting fraud helps increase the rotation rate and therefore increases the available capacity mechanically. This new approach should also have a beneficial effect on the environment by limiting pollutant emissions which will result in a reduction in congestion.

City of Paris (43,000 spaces - 150 members of staff)

8th, 9th, 10th, 17th, 18th and 19th arrondissemements

- Duration of the contract: 6 years
- Service provision contract
- Parking control and management of claims
- Human control supported by automated systems (scan cars and scooters) to carry out the pre-controls
- Virtual tickets platform supplied by the City of Paris
Parking control in Amsterdam

Since 2016 Egis has been operating the 150,000 paid on-street parking spaces in the city of Amsterdam. The 100% digital approach that has been adopted makes it possible to obtain a constantly rising spontaneous payment rate. In 2016 it was 85%.

150,000 parking spaces

Price:
- Between €0.1 and €5 for one hour
- Fine: €38

180,000 permits
- 56 zones
- 26 different types of permit

30 types of exception right
- Disabled people
- Social workers
- Sports clubs

2400 parking meters

100% digital

EPA Award for Innovation 2017 for the “On-street parking” category

For its 18th Congress the European Parking Association awarded the Prize for Innovation to Egis in the field of digital applications adapted to parking management.

PUBLIC TRANSPORT, THE ALTERNATIVE OFFER

Exclusive right of way for public transport to unblock road traffic in conurbations

Exclusive rights of way are essential as an efficient way to lighten road traffic. Exclusive right of way is a passenger public transport system using a lane or space allocated exclusively to the system, and in most cases benefiting from priority at lights and intersections. Several types of exclusive right of way exist: BRT (Bus Rapid Transit), tramways, underground railways and even cable transport systems. For the user this provides shortened transport times, higher frequency on routes and a pleasanter, more
comfortable journey. For more than 50 years and with more than 1500 km of achievements in exclusive right of way, Egis has used its expertise to support local authorities, enabling each conurbation to identify the most suitable exclusive right of way mode for its needs.

In Nice an adapted tramway type transport offer provides an efficient alternative to the car.
V. TOMORROW’S TRANSPORT

Driverless vehicles (autonomous vehicles)

A driverless vehicle is one which can travel on the open road without the intervention of a driver. Over time the aim is to develop a vehicle which can operate in any situation in real traffic, on a non-specific infrastructure without the intervention of a human being.

The driverless vehicle, a standard vehicle in origin, is fitted with digital sensors (cameras, radars, sonars, lidars, etc.), the data from which is processed by specific software and processors:

- When this data is merged this software reconstitutes the 3D road situation by shape recognition (limits of carriageways, lanes, vehicles, obstacles, signs) and uses artificial intelligence algorithms to decide what action should be taken on the vehicle’s controls.
- The actions decided upon by the software are performed by servo-controls on the steering wheel, accelerator, brakes and various interfaces allowing the engagement and disengagement of the automatic driving mode.

The use of cooperative systems is crucial for increasing the safety of future driverless vehicles and their full integration into the global transport system by the following functions as an example:

- Guiding driverless vehicles when crossing traffic lights and toll booths.
- Transmitting warnings to the vehicles concerned whenever the situation so requires (traffic, incident, roadworks, etc.).

Driverless shuttles (autonomous shuttles)

Driverless shuttles are a hot topic and considered to be the transport of tomorrow. They will be the source of many technological and legislative challenges in the future. Egis has won two contracts for driverless shuttles, in the United Arab Emirates and the United States, which show its capacity for innovation abroad and makes it a major player in the transport of the futures.

Variable capacity shuttles in Dubai, United Arab Emirates

Bluewaters Island is a new tourist destination offered by Meraas, a Dubai-based property company. Both modern and family-friendly, it combines the joys of urban life with those of the seaside. The island is intended to be an assortment of shops, residential complexes, restaurants, health and leisure centres.

The automated transport system (Ground Rapid Transit - GRT) will link Bluewaters Island to the Dubai underground railway in the residential quarter in less than 5 minutes. Via a dedicated 2.8 km
platform with 2 separated traffic lanes, largely over a viaduct, it will allow a shared journey for 6 to 24 passengers per vehicle. The number will vary depending on the period of the day. In fact it will offer flexible capacity, from service on demand at off-peak times to 2500 passengers per hour in each direction at rush hour periods.

The GRT product from the Dutch company, 2GetThere, has been selected.

Egis, in partnership with Parsons and Atkins, will provide the engineering for both the design and the construction of the transport platform, a station and the depot/maintenance centre/control centre complex, as well as the project integration in its entirety.

The Bluewaters GRT project is a first in terms of capacity-driven use of the transport method using a driverless shuttle. In rush hour the GRT system proposed is, in fact, comparable in terms of transport capacity to a light tram type system.

**Technology change for the “People Mover” in Jacksonville in the United States**

Within the context of the “Ultimate Urban Circulator” project the transport authority in the city of Jacksonville (Jacksonville Transportation Authority, JTA) wishes to modernise its public transport system. This ambitious project involves changing the “Jacksonville Skyway”, the current low-capacity automated transport system (also known as the People Mover), which has been in existence for more than 30 years and makes it possible to cross the city centre, into a new public transport system based on driverless vehicles.

The JTA has therefore started consultations to obtain a study of this project so that its needs are met specifically, to plan it over time and to take advantage of the best possible technologies.

With its American partner, Louis Berger, Egis is responsible for carrying out the study on this driverless vehicle transport system, which will be based on a wide range of technologies already in existence.

This project, the second in the United States for the Louis Bergis/Egis Joint Venture, is the first project for the replacement of a People Mover type existing transport system by driverless shuttles.
COMMUTE project in Toulouse

Egis is part of the first driverless shuttle project in the Toulouse metropolis. With the European Union and several partners, the conurbation is embarking on an innovative, ambitious project: the “COMMUTE” (Collaborative Mobility Management for Urban Traffic and Emissions reduction) project which involves creating a shared lane for a driverless shuttle over 2.6 km in Pibrac.

Hyperloop: Egis has a piece of the action

Hyperloop, an innovative project invented by the entrepreneur, Elon Musk, is a means of transport which involves moving a shuttle in magnetic levitation in a reduced-pressure tube, which can reach 1200 km/h due to the maximum reduction of friction.

The concept seems to have come straight from a science fiction film but it could, however, become a reality in the very near future.

Hyperloop Transportation Technologies (HTT) has already called on Egis to carry out the detailed design of the test track, which will be constructed in 2018 at Francazal airport near Toulouse. This French site has, in fact, been chosen by HTT for the installation of its world test centre, made up of 2 test tracks and a 3000 m² research centre.

Our teams were entrusted with a detailed designed study of the 1 km aerial test track, as well an assignment for assisting the project management. Discussions are ongoing to decide on other forms of collaboration in the longer term.

For Egis, this ambitious project is a real opportunity to encounter a world where the forms of work are different, where new technologies could make an appearance and sketch out the uses for tomorrow.
VI. TOMORROW’S MOBILITY… A COLLECTIVE CHALLENGE

The growth in world population will cause a large increase in journeys by 2050. Even so, is traffic saturation inevitable? Not if engineering companies like Egis, and also the town planners, legislators and users, coordinate to put in place new tools that are more suitable for tomorrow’s challenges. Here the challenge is obviously collective!

In coming years multi-modality will be the core of the transport offer. To be truly efficient the new travel methods must be treated in a global context and combine electric mobility, shared mobility, transport networks and driverless vehicles.

See our Press Space at www.egis-group.com

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