

Research projects in conjunction with the French National Research Agency (ANR)

► PROPICE applied to stealthy road works:

As leader of the PROPICE research consortium for 3 years, Egis brought together several major public and private sector partners to devise an overall approach to stealthy works, from design to operation.

► FURET: "stealthy urban works"

following on from PROPICE, Egis is working within a research consortium to improve urban works complexity management.



A few projects in France that developed stealthy road works

► **Applying the Egis OPTRA software** as part of simulations carried out on portions of the A7 motorway in Valence, the A9 in Narbonne and the A61 in Carcassonne.

► **Addressing traffic disruption in the design stage:** widening the hard shoulder on the A7 motorway (2 km widening project, 76,000 vehicles/day)

► Promoting the use of innovative techniques:

- on the A8 motorway in an urban area (75,000 vehicles/day): viaduct repair, invitations to tender open to alternative solution proposals by contractors to meet strong site constraints (materials including composites, tools, methodology, etc.)

- use of High Performance Fibre Reinforced Concrete (HPFRC) on the A51 Coynelle-Col du Fau motorway, to clear traffic on the roadway and accommodate mountain weather conditions.

► **Defining disruption criteria in the tender specifications:** widening of 40 km on the A63 Ombres-Bariatou motorway, two lanes kept open in each direction and returning to dual carriageway conditions with the hard shoulder in the summertime.

► **Reducing disruption for traffic and local residents:** widening of 20 km on both sides and optimisation of the overall delivery time on the A36 Belfort-Montbéliard motorway (60,000 vehicles/day).

► **Taking safety into account in the overall works scheduling:** widening of 20 km on the A61 Toulouse-Villefranche motorway.

► **Promoting feedback:** building up on best practices at the end of the project with the project manager, contractors and operator on the A62 Montauban-Saint Jory motorway (37,000 vehicles/day).

An integrated offer for road and motorway projects



Stealthy works under traffic

About Egis

Egis, a subsidiary of the French "Caisse des Dépôts" and "Iosis Partenaires" (shareholding by executive partners and employees) on a 75%-25% basis, is a consulting and engineering group working in the fields of construction for transport, urban development, buildings, industry, water, the environment and energy. The group is also active in project financing and road and airport operation.

The new group results from the merger, on 1st January 2011, of Egis, a leader in infrastructure engineering and Iosis, a French leader in construction and civil nuclear engineering.

With 11,000 employees, of whom 7,000 in engineering, and a turnover of €800 million in 2010, the new group is present in over 100 countries and has around 50 offices in France.

More information www.egis-group.com



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It is the only French construction engineering group amongst the first ten European groups and the first twenty groups in the world.

Close to local and national stakeholders, Egis proposes engineering services in the field of urban development, from buildings to transport infrastructure: hospitals, tertiary buildings, stadiums, museums, stations, airports, tramways, etc.

It is an internationally-recognised actor for its experience in major transport and civil engineering projects: high-speed railway lines, motorways, port terminals, civil nuclear engineering, etc.

Its state-of-the-art expertise also covers sectors such as water, the environment and landscaping.

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Stealthy road works

Egis expertise developed for entire project lifecycles

When road and motorway works are carried out under heavy traffic, the major challenges to be taken into consideration include improving traffic congestion, **user acceptance of the works**, maintaining a high **level of service** and **optimising construction costs**. At the same time, within the framework of sustainable development, special attention must be paid to reducing greenhouse gas emissions and noise pollution. To help its clients meet these challenges, Egis has built on its international experience of over 3,000 km of works under traffic, to put together an integrated offer focused on reducing the negative impacts of its works and leveraging a wide range of expertise.

Defining stealthy works objectives

- Qualitative and quantitative description of the disruption, definition of indicators, simulation tools, search for optimised operating scenarios
- Analysis of the value and overall cost of stealthy works solutions
- Project feedback and benchmarking



Managing projects from programming to operation

- Dynamic management of the works scheduling and operating measures
- Enhanced analysis of risks, conflict situations and crisis scenarios
- Supervision of innovative technique implementation



Defining contractual requirements and allocating works

- Definition of the contractual strategy and criteria aimed at involving all project partners in meeting the stealthy works objective
- Definition of methods for assessing stealthy performance



Egis expertise and stealthy road works

Organising projects

- Specific coordination of the stakeholders within the overall project governance structure
- Management of project teams with the assignment of roles: quality, safety, environment, stealthy works
- Strategy fostering works on operator networks



Designing whilst innovating

- Proposals and trials concerning new materials and innovative techniques
- Traffic diversion study, traffic management plans
- Studies of alternative transport solutions and modal shifts, mobility consultancy



Informing, consulting and communicating: a major challenge throughout the project

- Support with the communication and consultation strategy aimed at all economic and institutional stakeholders
- Assistance in introducing communication tools to keep clients, local residents and stakeholders abreast of the project



Egis OPTRA software
1st innovative eco-comparison tool to minimise congestion and pollution caused by works

- Simulation and optimisation of works scheduling, with real-time operation option
- Calculation of delays, over-consumption and the emission of greenhouse gases and other pollutants
- Assessment of the works' external costs (time, consumption, pollution) in the design and operating phases

Project references:
ASF - ESCOTA - SANEF
(French motorway companies)

OPTRA was awarded first prize by PIARC (World Road Association) in 2008 and was selected by the French Directorate General for Infrastructure, Transport (DGITM) for trial implementation on its worksites.