

## Innovation policy in France

### ***The context***

The French Directorate of Roads has for some time been aware that innovation in the roads sector can only develop on condition that the processes have been tested and validated by procedures that associate the owners. The Directorate of Roads, responsible for the largest French highways network, supporting road engineering and organising the most essential departments responsible for the construction of infrastructures, has for a number of years committed itself to a policy that aims to stimulate progress in highway engineering by involving itself alongside the contractors.

Highway innovation presents major specific attributes that are worth noting:

- ***Full-scale site works are essential.***

Only the experience of a real highway under real traffic conditions can validate the sustainability of an innovation. Experimental site works represent an essential stage in the innovation process inasmuch as owners do not want to assume long-term guarantees of sustainability, given that these guarantees can no longer be covered by insurance policies.

- ***The sharing of risks between contractors and owners is justified.***

Experimental site works are profitable to the owners and the users for both financial and functional reasons. This is why the sharing of risks should be accepted.

- ***The time required to provide assessments discourages normal distribution.***

The working life of facilities and infrastructures and the length of renovation cycles slow down the transmission of innovations in highway engineering.

- ***The size of the network favours the use of innovation.***

A large network is more open to experimentation and the validation of innovations because any failure has a financial impact that is relatively less critical, because it makes it easier to find the site best adapted to carry out experiments, and because it provides the possibility of objective comparison.

Under these circumstances, the aim is to favour the creative capacity of contractors by providing backing for the research policy as well as – and this is the ground-breaking nature of this policy – carrying through new processes, new methods and new products through to their operational stage. This joint validation framework between the State and the contractor will reveal the technical and financial validity of the innovation, followed by the stabilisation of industrial processes able to provide performance levels acceptable to the road owners.

When validated in this way, the innovation no longer has to provide the guarantees that are otherwise so difficult to provide for highway engineering works.

Various parties are jointly working together to develop the innovation support policy: public owners, contractors, public engineering network, university laboratories.

The approach needs to cover:

- the functional aspects: to meet the needs of the owners,
- the economic aspects: to check the cost/efficiency ratio,
- the legal aspects: to respect the rules governing public contracts,
- the organisational aspects: to ensure the “industrial” development of the product on the market,
- the promotional aspects: to back the commercial start-up of the product or process.

This has resulted in experiments being carried out over the past ten years to meet the concerns of owners or to help develop aggressive policies. These experiments have also led to the increased exportation of the know-how and dynamic approach held by French contractors.

These experiments have particularly concerned:

- ultra-thin bituminous concretes,
- high performance hydraulic concretes,
- composite bridges with pleated webs,
- automatic patching:
- pavement reinforcement techniques.

These experiments have led to the technical validation of innovative products and procedures through the issuing of use suitability certificates.

They permit the marketing and development of new products that have been tested and are guaranteed as being suitable for use.

In the first few years, this innovation support policy was favoured by the large amount of infrastructure works carried out by a single owner, the French State. This situation meant that the “risk” taken was relatively low and easily acceptable.

In the 1980s and 1990s, the partnership expanded and motorway concessionaire companies also became involved.

This led to a clear improvement in the quality of French roads and motorways. There was also a significant progress in the maintainability and sustainability of road infrastructures.

## ***The weaknesses***

However, certain difficulties that need to be taken into consideration rapidly made themselves felt. These are linked to:

### **- The reduction of real experimentation possibilities**

There are two reasons for the number of innovative works being reduced:

- The first is that because the innovation policy showed such good results, it led to contractors holding an excellent technical position and, consequently owners felt it less urgent to continue investing in innovation as they considered that an innovative slowdown would not lead to any technical risks.
- The second is that the considerable reduction in the number of projects results in an increase in the relative risk level. As local engineers could not permit any failures in the works under their responsibility, they became less enthusiastic about providing sites to carry out experiments.

Paradoxically, the result is that France, because it has such a good highways infrastructure, is carrying out fewer experimental works.

### **- The legal framework**

To be introduced, it is necessary that the innovation falls within the level of transparency required by public contracts. This was the case until recently when a more restrictive interpretation of the Public Contracts Code was introduced that led to the possibility of using procedures that depart from standard systems being refused unless first opened to competitive tendering.

But, for innovative works, it is necessary that, within the scope of a joint charter, the public owner must, alongside the contractor, be able to share the risk as to the results, undertake more detailed inspection procedures (the appropriate supervision of experimental works engenders an additional cost that must be taken into consideration) and, above all, adapt the site characteristics to the nature of the innovation being tested. Consequently, it is not possible to fully apply the rules governing open competition.

This is why, in 2002, the Directorate of Roads carried out a general audit with the aim of validating the interest of pursuing an assertive highway innovation policy and to find the legal means to permit this to be carried through.

## ***The new priorities***

As we have already stated here in the French pavilion in Durban, the pursuit of this policy is made that much more necessary as it permits new priorities to be incorporated into the French innovation policy.

These new priorities concern societal demands that are undoubtedly much more complicated to satisfy than the purely technical considerations that have so far been mentioned. Nevertheless, exchanges with the entire international scientific community ought to result in the development of innovative ideas.

These concern:

### **- Road safety:**

- skid resistance, road equipment, road marking,
- Electronic driver information systems, driving aids, driving offence statements, etc.

There are many ways to increase safety, particularly by providing the safest (or best adapted) infrastructure.

### **- The environment:**

- Noise, air and soil pollution control.
- Cleanup techniques, recycling of materials and waste.
- Integration of highways into the landscape, with the particular aim of improving the way in which the driver appreciates the road.

All these areas need to be examined in greater depth in full-scale situations.

### **- The national network**

The aim is to provide simple highway assessment and repair methods, knowing that a preventative maintenance and repair policy results in reducing the extremely high cost of remedial works that far too many countries already suffer.

## ***The proposals***

Given these constraints, the directions worth pursuing that now exist are as follows:

### **On an international level:**

- What is innovative and that has been validated in one country must be transferable to another. Exchanging our experiences means increasing our field of experimentation, accelerating validations and increasing our knowledge. This favours innovation and the development of this innovation.

- In an area requiring innovation, it is necessary that the concerned persons from different countries operating in adjacent fields meet with one another. This goes beyond the strict interpretation of highways as such. For example, these fields could include telecommunications, information handling, etc. They might result in the opening up of areas that have as yet been little explored.

- Meetings held within the framework of PIARC must continue to act as a melting pot for innovative ideas and help transform these from theory into practice. We must ensure that the contents of our exchanges reach a large number of people.

### **On a national level:**

- It is necessary to find a well-founded legal solution that will allow the full-scale experimentation and validation of innovative procedures. The audit now being carried out is testing various solutions.

Comparisons with legal situations in other countries, especially European, are welcome to establish a solid base for drafting contract clauses.

- Define the contribution made by each of the concerned parties (owner, project manager and contractor) to the taking of risks, depending on what proportion each party can accept and the “profits” that these parties might derive.

- Better communicate to:

- understand the procedures that exist in each of our countries to provide support for innovation,
- place greater emphasis on those developing innovations,
- share acquired know-how and the values that we wish to promote.

### ***Conclusion***

The first results of the audit launched by the Directorate of Roads noted the interdependence of those involved in innovation.

This level of solidarity is also shared by the international road community in its aim to promote new ideas that will preserve our quality of life, increase the safety of road users and assure the sustainable development of our road networks.