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MANAGEMENT OF MEASURES to reduce and compensate for the environmental impact of the LGV Sud Europe Atlantique Tours-Bordeaux high-speed rail line project

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Managed by Vinci Construction Terrassement, COSEA is the company responsible for the design and building of the high-speed rail line Sud Europe Atlantique Tours-Bordeaux.

COSEA is also composed of Eurovia and VINCI Energies in association with BEC, NGE, TSO, Ineo, SYSTRA, Arcadis et Egis Rail. Since 2010, as Head of Environment and Sustainable Development of COSEA, Clara Lorinquer has been in charge of the implementation of the environmental requirements of the LGV SEA project. She is currently Director of Environment and Quality at Eurovia.

KEYWORDS

- RAIL CONCESSION
- ENVIRONMENTAL IMPACT
- BIODIVERSITY
- CONTRACTUAL COMMITMENTS
- GOVERNANCE

The ambitious new Sud Europe Atlantique Tours-Bordeaux high-speed rail line profoundly reshapes the landscapes through which it passes, with consequences for biodiversity and for local residents. Given the multiple challenges (financial, operational, legal and governance) related to the protection of biodiversity, the project team has decided to take responsibility for defining and managing impact reduction and compensation measures. A strategy built on stakeholder accountability, contractual commitments and shared governance has therefore been implemented.

INTRODUCTION

With its goal of linking Paris to Bordeaux in just two hours, the Sud Europe Atlantique Tours-Bordeaux high-speed rail line (or LGV SEA Tours-Bordeaux) is one of the most ambitious rail infrastructure projects undertaken in recent years.

This is a project on a grand scale: the section between Tours and Bordeaux involves no fewer than 302 km of new track, 10 connections to the national rail network over a 40 km stretch, and 500 engineered structures, including 19 viaducts. A total of 68 million m³ of material will be excavated, with 36 million m³ of backfill used to create embankments, 1.1 million tonnes of sleepers and 3 million tonnes of track ballast.

The LGV SEA is also the first rail contract granted by the French network operator Réseau Ferré de France (RFF) to a private operator – VINCI – for a period of 50 years from 30 June 2011. The contract covers the design, construction and operation of the entire line.

The project timetable is complex. The line is expected to become operational in summer 2017, only six years after the official start of the project; a schedule between two and three times more demanding than for previous high-speed lines. Furthermore, the terms entail penalties for late delivery that could challenge the economic and financial balance of the entire project.

Against this background, precise control of the environmental requirements of the project is an essential aspect of its environmental and social acceptability. The project team has put in place a structured and participative approach to take full account of the economic, operational, legal and governance issues involved in environmental and wildlife protection.

1. THE ENVIRONMENTAL AND SOCIAL ACCEPTABILITY OF THE LGV SEA VERY QUICKLY BECAME A CENTRAL CHALLENGE

Although rail projects usually enjoy a broadly positive image as far as public opinion is concerned, an increasing number of high-speed lines are now the focus for reluctant acceptance or even structured opposition.

1.1. MANY IMPACTS THAT REQUIRE A STRUCTURED APPROACH

The issue of environmental and social acceptability is particularly important given the significant potential effects of this project. In practical terms, the LGV SEA profoundly reshapes the landscapes through which it passes, with consequences for biodiversity and impacts for local residents.

The local acceptability of the LGV SEA is therefore dependent on the way in which all these impacts are managed.

- **The landscape and countryside:** the LGV SEA line runs through three regions (Aquitaine, Poitou-Charentes and Centre), six departments and 117 local communities. With 200 kilometres of track, Poitou-Charentes is the region most affected by the project: it effectively cuts the departments of Vienne and Charente in two, with around 90 kilometres of track running through each. Over and above the route of the line itself, the creation of new infrastructures – chiefly engineered structures and sidings – changes the landscape significantly.
- **Local residents and farmers:** some 11,000 landowners are affected by the construction of the high-speed rail line, and the daily lives of local residents are also temporarily disrupted as a direct result of the project (re-routing of roads during the construction project, road traffic issues, etc.). Managing surplus excavated earth requires a process of permanent dialogue with local farmers in order to manage the excess material produced.
- **The environment and biodiversity:** the LGV SEA affects 14 Natura 2000 sites that are specially protected due to the rarity and/or fragility of the wild species they shelter, and impacts on more than 220 protected species, including the Little Bustard, the region's official bird currently under threat of extinction, and the European Mink, a semi-aquatic mammal.

1.2. MULTIPLE CHALLENGES TO BE RECONCILED BEFORE SUCCESS CAN BE ACHIEVED

Adoption of the project by all stakeholders is also constrained by the need to comply fully with a set of very specific requirements. From the operational point of view, it is therefore essential to avoid any delay to the in-service commissioning of the line, which would be punished by very substantial penalties.

Environmental and wildlife protection is a major challenge that must be addressed in strict compliance with the schedule of works. For example, the period devoted to the work required to clear rights-of-way (vegetation clearance and topsoil stripping) traditionally begins late winter/early spring, but this also marks the beginning of the breeding season, which generally runs from April to September. For the LGV SEA project, only three seasons of groundworks were possible.

The key challenges posed by environmental and wildlife protection are simultaneously financial, operational, legal and governance-related.

- **A financial challenge:** the cost of compensatory measures could prove to be very high. For example, the agreed compensatory measure for the Little Bustard was €500 per hectare, per year, with 540 hectares to be covered by this measure for the full route of the line, resulting in a total of €270,000. In addition to this cost, land purchases are necessary for

**3 REGIONS,
6 DEPARTMENTS AND
117 LOCAL COMMUNITIES**
crossed by the rail line

11,000 LANDOWNERS
affected by the construction
of the high-speed rail line

14 NATURA 2000 SITES
and more than
**220 PROTECTED
SPECIES** impacted

a further 160 hectares of compensatory measures. These amounts do not include the costs involved in finding the land concerned and conducting ecological studies and analyses. For example, in the Department of Charente, the compensatory measures to protect lowland birds involve 287 hectares, 101 of which must be purchased.

- **An operational challenge:** the implementation of impact reduction and compensatory measures requires the identification of practical solutions in the field, which have significant consequences for construction conditions and the methods used on site, especially in terms of landscaping and civil engineering (impact reduction measures), and for the lives of local residents, especially farmers (compensatory measures). The compensatory measures implemented to protect the Little Bustard require some land normally used for cereal cultivation to be replanted with lucerne, a herbaceous forage crop essential to the bird's nutrition and nesting. The challenge is then to find farmers prepared to switch from growing cereals to harvesting lucerne. This constraint is further complicated by the obligation imposed on farmers to delay harvest until after the breeding season of the species concerned.
- **A legal challenge:** environmental and biodiversity protection has been strictly governed by French law for many years. Already enshrined in nature protection legislation dating from 1976, article 230 of the Grenelle 2 law establishes the three inseparable obligations applying to the environmental impacts of major infrastructure projects: "to avoid, reduce and compensate for negative environmental effects".

VINCI has addressed each of these obligations through the implementation of measures throughout every phase in the design and construction of the LGV SEA.

- **Avoid:** during the design phase, the teams of LISEA and COSEA (respectively the concession holder and the design/construction company – see inset) focused on avoiding the most contentious areas and zones, continuing a task already begun by the rail infrastructure operator RFF when planning the original route of the line.
- **Reduce:** applied chiefly during the construction phase, impact reduction involves – for example – suspending work on the clearance of rights-of-way (tree felling, initial topsoil stripping, etc.) during breeding seasons or maintaining the ecological transparency of the infrastructure by providing wildlife corridors for small animals (above or below the line, whether in conjunction with watercourses or not).
- **Compensate:** the duty to compensate for any residual impact applies to all developments and infrastructures. Each hectare destroyed is therefore the subject of a compensatory measure. For the LGV SEA Tours-Bordeaux project, the compensation ratio varies between 1 and 10. In total, the compensatory measures implemented for wildlife species impacted by the project comprise more than 25,000 hectares. Thanks to pooling – the same physical hectare of compensatory measure is home to more than one species – an envelope of around 3,500 hectares of compensatory measures distributed across four main habitat types (lowland birds, wetland and aquatic areas, mature woodlands and open land) will cover all the compensatory footprint requirements of each species.
- **A governance challenge:** the issue of acceptability does not fall neatly into any precise legal category. Although many existing legislative texts and laws set

out strict limits on environmental impact reduction and compensation measures, the issue of governance (the identity of local stakeholders, how they should be included in the process, etc.) is delicate and challenging in as much as no real governance structure yet exists – unlike in other fields, such as employment. More specifically, compensation measures fall outside the project's official declaration of public interest (Déclaration D'Utilité Publique). So outside the specific legal framework, it is essential to invent ad-hoc organisational and decision-making methods.

2. A STRATEGY BUILT ON STAKEHOLDER ACCOUNTABILITY, CONTRACTUAL COMMITMENTS AND SHARED GOVERNANCE

Given these many challenges, the project team has decided to retain responsibility for defining and managing impact reduction and compensation measures. This is a strategic decision, since this aspect of the project could have been delegated in its entirety to a service provider such as the Caisse des Dépôts subsidiary CDC biodiversité.

Having made the decision to manage the LGV environmental impacts in-house, VINCI has implemented a structure designed not only to involve all stakeholders in the consultation phase, but also and more importantly in the definition and implementation of measures. This structure relies on three cornerstones: **(1)** accountability, **(2)** contractual commitment and **(3)** governance involvement for all stakeholders.

2.1. STAKEHOLDER ACCOUNTABILITY

At the beginning of November 2010, a series of meetings were held with local stakeholders to gain an understanding of their perception of the project and its impacts, their expectations and their concerns.

The principle is as simple as it is essential: meetings with all project stakeholders, from Fishing Federations and Chambers of Agriculture to Nature Conservancy Bodies (Conservatoires des Espèces Naturelles or CEN), Regional Landownership Centres (Centres Régionaux de la Propriété Foncière or CRPF) and nature protection associations. This round of consultancy with stakeholders began in Poitou-Charentes with a visit to Poitou-Charentes Nature, and continued in all three of the regions through which the new rail line passes.

This stage was crucial in terms of representation, and made it possible to identify all the project's environmental stakeholders at local level. But above all else, it identified an opportunity that has proven to be a key factor for the success of the project: sourcing locally all the skills needed to define and implement impact reduction and compensation measures.

The local level stakeholders were identified as:

- environmental associations and experts with the ability to identify potential areas and the measures to be implemented for each protected species affected by the LGV project (e.g. the need for the Little Bustard to have access to lucerne);
- professional federations (fishermen, farmers, etc.) with the ability to define those measures assessed as 'acceptable' (e.g. regarding the switch from wheat growing to lucerne), identify land within the areas jointly defined, and support the relevant professionals in implementing these compensatory measures.

Ultimately, the cost of the measures concerned was able to be defined jointly with VINCI teams.

THE PROJECT ORGANISATION AND STRUCTURES

To ensure the smooth-running of the contract, VINCI has put in place an organisational structure to manage the project for its full term:

- **LISEA:** the contractor managed by VINCI Concessions (28.5%), VINCI SA (5%), CDC Infrastructure (Groupe Caisse des Dépôts et des Consignations), Sojas SAS, AXA IP and AXA II.
- **COSEA:** the design and construction company whose authorised representative is VINCI Construction Terrassement, which is owned equally by Eurovia and VINCI Energies in association with BEC, NGE, TSO, Ineo, SYSTRA, Arcadis and Egis Rail.
- **MESEA:** the maintenance and operations company owned jointly by VINCI Concessions (70%) and SYSTRA.

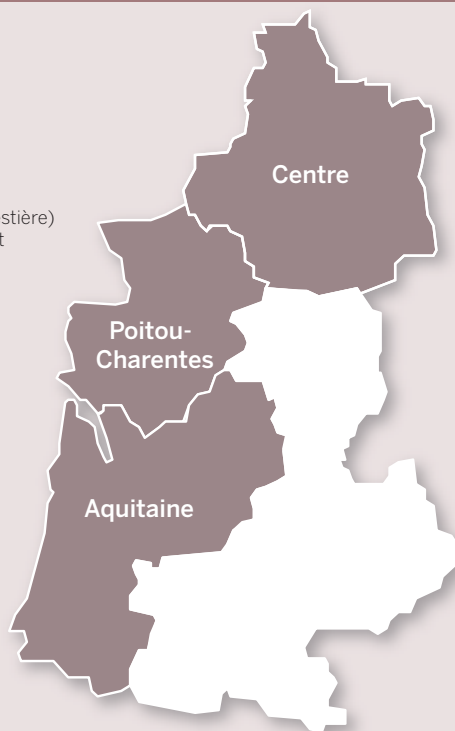
Key stakeholders by region

Poitou-Charentes region

- CEN (Conservatoire d'Espaces Naturels)
- LPO France
- Poitou-Charentes Nature
- Fédérations de Pêche
- Chambers of Agriculture
- CRPF (Centre Régional de la Propriété Forestière)
- SAFER (Société d'Aménagement Foncier et d'Établissement Rural)

Aquitaine region

- CEN (Conservatoire d'Espaces Naturels)
- Chamber of Agriculture
- Fédération de Pêche
- SAFER (Société d'Aménagement Foncier et d'Établissement Rural)
- LPO France



Centre region

- CEN (Conservatoire d'Espaces Naturels)
- LPO France
- LPO Touraine
- SEPANT (Société d'Étude, de Protection et d'Aménagement de la NaTure)
- Fédération de Pêche
- Chamber of Agriculture
- CRPF (Centre Régional de la Propriété Forestière)
- SAFER (Société d'Aménagement Foncier et d'Établissement Rural)

The next step was to draw on these local skills by applying the principle of accountability to involve the stakeholders in the process of defining and implementing impact reduction and compensation measures. After a series of bilateral meetings over a period of two months, a meeting was held in December 2010 to bring together all stakeholders with the project management team to formulate an initial agreement on cooperation methods.

2.2. THE PRINCIPLE OF CONTRACTUAL AGREEMENT

The next stage was to prepare a framework within which the compensatory measures would be operationally implemented. For this purpose, a general wildlife innovation agreement was signed by all stakeholders in June 2011, after six months of negotiation. This agreement sets out the major compensation measures, maps their locations, and allocates individual roles (ecological analysis, site identification, etc.).

In Poitou-Charentes, the management plans were developed with input from all stakeholders (VINCI, CREN Poitou-Charentes, the Poitou-Charentes Chambers of Agriculture, the nature protection associations represented by Poitou-Charentes Nature and CRPF Poitou-Charentes) focusing on three methodologies.

(1) For the acquisition of non-agricultural land: the nature protection associations represented by Poitou-Charentes Nature and CRPF Poitou-Charentes consult on the woodland clearance and – in conjunction with CREN Poitou-Charentes – evaluate and propose the management measures to be implemented.

(2) For the acquisition of agricultural land: the associations represented by Poitou-Charentes Nature – in partnership with CREN Poitou-Charentes –

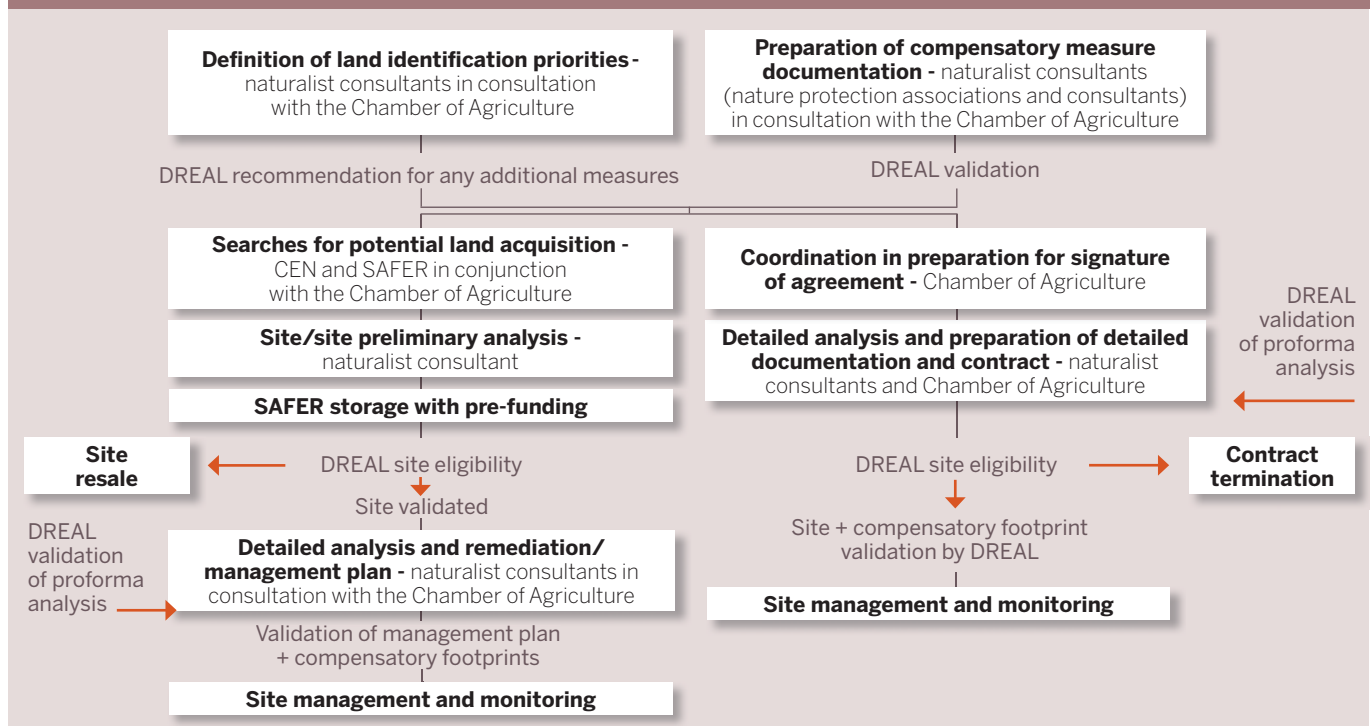
assess and propose the management methods to be implemented, accompanied by systematic consultation with the Chambers of Agriculture

(3) For contractual agreements: the Chambers of Agriculture assess and propose management measures in partnership with the associations represented by Poitou-Charentes Nature.

At the same time, bilateral agreements were signed with each stakeholder concerned in order to define reciprocal missions between them and their counterparts.

“FOR THIS PURPOSE, A GENERAL WILDLIFE INNOVATION AGREEMENT WAS SIGNED BY ALL STAKEHOLDERS IN JUNE 2011, AFTER SIX MONTHS OF NEGOTIATION. THIS AGREEMENT SETS OUT THE MAJOR COMPENSATION MEASURES, MAPS THEIR LOCATIONS, AND ALLOCATES INDIVIDUAL ROLES (ECOLOGICAL ANALYSIS, SITE IDENTIFICATION, ETC.).”

Definition, management and monitoring of compensatory measures



This strategy has proven effective thanks to the combination of at least four factors:

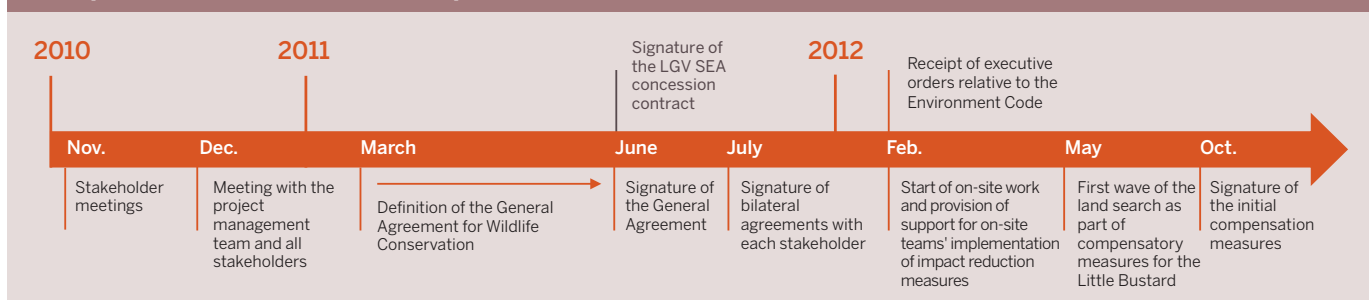
- **Discussions held at a very early stage** (*see timeline*): the various meetings and discussions held with stakeholders made it possible to arrive at an agreed method for environmental impact management before work commenced on site.
- **A shared contractual arrangement**: the drafting of the agreement and its approval by all stakeholders helped to build a climate of trust further assisted by the decision of VINCI to avoid competition between stakeholders. The partners were then able to put the agreement into practice and adapt it to reflect on-site realities.
- **A partnership-based relationship**: the agreement united the stakeholders in a true partnership agreement, rather than a supplier relationship, the effect of which was to enable joint definition of

compensatory measures and complete freedom of expression. As a result, the compensatory measures submitted to government departments were rapidly approved because they had been defined on the basis of consensus.

- **Procedural transparency**: to ensure the best-possible definition and operational implementation of impact reduction measures, the environmental protection organisations were also tasked with supporting on-site work teams in defining and implementing appropriate measures. The LGV SEA project was the first to be completely open to all stakeholders, who were able to see for themselves the potential consequences of the route, those habitats most at risk, etc.

The work carried out jointly by VINCI and the local stakeholders ultimately resulted in the emergence of a win-win model. On the one hand, the Group's teams were able to deliver more effective project management and compensatory measures. On the other, the environmental experts have often highlighted the fact that they have discovered new opportunities and working methods as a result of working closely with a private-sector operator for the first time.

Timeline of the definition and signature of initial environmental impact reduction and compensation measures



2.3. SHARED GOVERNANCE

Three governance bodies (see *inset*) were set up to guide and monitor the measures implemented; all three were created from scratch in each region, with members drawn from the project team and stakeholder signatories to the agreement. The **Management Strategy Committee** (Comité Stratégie de Pilotage or CPS) chaired by LISEA develops and proposes the compensatory measure implementation policy, while the **Working Groups and On-site Support Groups** respectively provide support and follow-up for the compensation measures implemented in the four habitat types (lowland birds, wetland and aquatic areas, mature woodlands and calcicolous grasslands) and impact reduction measures in the on-site construction phase. The **Local Monitoring Operational Committee** (Commission Opérationnelle de Suivi Local or COS) ensures compensatory measures (land finding strategy, progress tracking, etc.).

Strategic coordination of some cross-disciplinary topics is delegated to partners in the non-profit sector. For example, the task of evaluating compensatory measure effectiveness has been delegated to the French bird protection league (Ligue pour la Protection des Oiseaux or LPO) – a national-scale organisation – in order to guarantee the independence of results.

These governance methods have enabled stakeholders to be involved not only in defining and implementing compensatory measures, but also in supervising and monitoring them.

Governance bodies

Management Strategy Committee

- Ensures the alignment and compatibility between regulatory obligations and the missions of scientific and non-profit stakeholders
- Puts forward initiatives to develop the natural heritage in the context of compensatory and supporting measures
- Contributes to the design of compensatory measures
- Assesses the proposals made by scientific and non-profit partners
- Checks the implementation of measures and decides on follow-up action in the event of non-compliance
- Validates the standard agreements entered into with farmers
- Puts forward a policy to promote the initiatives implemented throughout the concession period
- Validates the communication strategy

Working Groups and on-site support Groups

- Prepare the specification for compensation measures (working groups) and construction phase impact reduction measures (on-site support groups)
- Proposes studies to the CPS and identifies the most suitable specialists
- Provides scientific qualification of site suitability and levers for action
- Four working groups: (1) lowland birds, (2) wetland and aquatic areas, (3) mature woodlands and (4) calcicolous grasslands

Monitoring Operational Committee

- Identifies the partners
- Implements compensatory measures
- Monitors work on-site and ensures compliance with recommendations
- Assesses the results of studies for the CPS
- Provides qualitative monitoring of compensatory measures over time
- Provides feedback that contributes to increasing knowledge of biodiversity

3. KEY FACTORS FOR SUCCESS

Four years after the signature of the general agreement and bilateral agreements, the strategy developed for the LGV SEA project in conjunction with its non-profit partners has enabled the consensual and effective introduction of environmental impact reduction and compensation measures. That effectiveness is well illustrated by the fact that no appeal has yet been lodged regarding the environmental and/or biodiversity aspects of the project.

A number of key factors for success have clearly emerged:

- **Management involvement:** with an issue as critical as environmental impact, a very high level of involvement by management and its support for the decision to manage compensatory measures in house have together facilitated the emergence of fast, innovative solutions. For example, COSEA Project Director Xavier Neuschwander attended all the meetings with stakeholders and co-signed the agreements.
- **The integration of environmental issues at a very early stage:** the decision to identify and discuss these issues with all stakeholders as early as 2010 has enabled a rapid pace of progress by respecting the principle of concurrent engineering which flows through the entire LGV SEA project.

- **Partnership:** the assertion and recognition of stakeholders as partners, rather than simply suppliers, has ensured the development of a climate of trust and mutual respect for each other's positions.
- **The leadership role played by VINCI:** throughout the process of defining and implementing compensatory measures, the Group has played its role as leader to enable the clear definition of the status and legitimacy of each stakeholder.
- **Transparency:** the opening up of the project to all stakeholders further strengthened the trust and transparency required to reach agreement.
- **Consensus:** the decision-making processes engaged in with non-profit partners meant that no voting took place; consensus was required for all the solutions and compensatory measures defined. The definition of consensual solutions meant that the measures submitted to central government departments respected the wishes and interests of all local stakeholders.