The mandatory resolutions as an opportunity. The case of ecological corridor and biodiversity project in Susa valley, managed by TELT-Tunnel Euralpin Lyon Turin

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ABSTRACT: TELT is the public promoter of the Mont Cenis Base Tunnel characterised by a strict regulatory context and a strong opposition movement. In view of the expansion of the main Italian construction site, TELT faced an important challenge: the valley is the habitat of a butterfly species (found by the opponents) included in the EU Habitat Directive. This subject has become an attractive topic for the media, affecting the project itself.

KEYWORDS: sustainability, transport, environment, logistics

1. INTRODUCTION

The new Turin-Lyon railway line is the central hub of the Mediterranean Corridor of the TEN-T. The 65-km-long cross-border section between Italy and France is under construction; its main section is the 57.5-km-long Mont Cenis Base Tunnel (the longest railway tunnel in the world). TELT-Tunnel Euralpin Lyon Turin, a bi-national public promoter, is in charge of the megaproject, financed by the European Union (40%), Italy (35%) and France (25%).

The construction sites are located in the Alpine valleys between Italy and France. On the Italian side, they are in the Susa Valley, an area with a typical Alpine climate, characterised by extensive biodiversity and the presence of species such as the Zerynthia polyxena butterfly.

Within this framework, TELT was faced with specific environmental requirements in the territories since the initial planning phase. Therefore, it decided its own strategy to combine environmental requirements, provisions imposed by regulatory bodies, protection of biodiversity and the execution of works. This resulted in the creation of an academic research group, which adopted an applied research concept. TELT chose to promote a scientific study on the animal and plant species in the Valley. The aim was to understand what actions to put in place in the area that would not only ensure the compatibility of the Lyon-Turin construction site with territory, but also generate an opportunity for the activation of biodiversity enhancement projects.

2. THE PATHWAY

In 2018, after a long project design phase and approval process for the public works, CIPE (Italian authority that authorises the financing of "priority public works"), approved the definitive plan of the cross-border section and the alternative construction works. This is a revision which mainly refers to the location of the Italian construction sites: the connection point with the base tunnel has been relocated to Chiomonte (where an excavation site for the geognostic tunnel already exists) and is no longer in Susa, where it would have been necessary to establish a new construction site. The alternative foresees compensatory measures relating to the interferences of the wood areas with the construction sites. More specifically, the requirements refer to:

- (no. 121 and 131) measures put in place to compensate for the converted forest area, aimed at rebuilding and enhancing the ecological and wildlife corridors in the Valley;
- (no. 135 and 136) specific surveys on Zerynthia to calculate the population and confirm the presence of this butterfly in 2.5 km from the construction site and, depending on the result of this survey, declare the construction site sustainable or put in place an action plan in the construction site to preserve the species.

3. FROM THE PROJECT TO THE STUDY OF THE BUTTERFLY

The Maddalena construction site switched from being an exploratory tunnel to the connection point with the base tunnel, generating an impact on about 5.6 acres of sparse woodland, where a temporary storage of spoil is foreseen. This area is inhabited by a nucleus of Zerynthia, a daytime butterfly included in Annex IV of the Habitat Directive whose habitat would be compromised by the storage, even temporary, of excavation spoil.

In line with the vocation for sustainability that accompanies the works, TELT decided to start from the most scientifically appropriate approach to address the topic in which it sees glimpses of certain aspects of experimentation and innovation that the Requirements do not envisage and are however part of the vision adopted by the promoter.

The EU Directive envisages the derogation from protective measures in the light of imperative reasons of overriding public interest, such as the Lyon-Turin line, without any compensatory measures. It follows that TELT would be exempted from finding a solution, nevertheless it decided to pose itself a question: how can we engage in a certain level of compatibility between the construction site and measures to safeguard and enhance the population of the Z. polyxena? And what actions would be possible? The initial idea is that an infrastructure of public interest should be placed within a context. As such, TELT's approach not only evaluated and managed the environmental impact on specific construction site areas, but focused on a more extended design plan that took into account different factors and variables in the area itself.

During 2018 a technical discussion took place between the promoter, the Zoology Laboratory of the University of Turin and ARPA (in charge of environmental protection, which had reported the presence of the butterfly in the territory) to share an investigation plan. In agreement with ARPA, TELT built a multidisciplinary team including the Zoology Laboratory, the Department of Agricultural, Forestry and Food Sciences and the Department of Life Sciences and Systems Biology of the University of Turin.

The round table indicated the need to assess the localisation or conformation of the construction sites in light of the results of a study on the level of population of the butterfly in the area and the distribution of the species in the immediate surroundings. These results also highlighted the need to ensure the conservation of the habitat of this species.

According to the CIPE statement, if there had been a substantial nucleus of individuals outside the construction site area, the population as a whole would not have suffered a level of damage

as to affect its state of conservation and the construction site activities could continue.

The study on Zerynthia was therefore accompanied by parallel research on the vegetation related to the butterfly's habitat as well as bats. Experts in butterflies, mammals and vegetation engaged in applied research and extensive dialogue with environmental engineers of a public infrastructural promoter: this led to the founding of the Biodiversity Conservation Research Group along the linear Infrastructure within the framework of the Lyon-Turin project.

4. THE FOCUS ON ZERYNTHIA

Z. polyxena is widely found in Europe, but it shows a declining trend. The main threat to this species is urbanisation and the extension of agricultural areas.

The monitoring of the field work by the Zoology Laboratory allowed it to estimate the size of the population in Chiomonte, censoring all the communities within a radius of 2.5 km and estimating the probability of survival in the medium and long term. Five sub-populations were censored, three of which within the range indicated. The community of the area is currently small and lively, but its long-term presence is not guaranteed given the progressive closure of the woodlands due to natural vegetation succession. According to the CIPE statement, losing the core of the construction site's expansion area would not affect the long-term presence of the community in the area. TELT could therefore have continued as per the project design plan but, in agreement with the regional technical round table, it decided to redesign the project site area to allow a community of Zerynthia to survive the expansion of the construction site.

According to the experts, the health status of all the populations in the area remains compromised in the medium term. The laboratory therefore proposed and obtained an intervention from the technical round table, aimed at compensating the loss of biodiversity triggered by the expansion of the construction site. This is not however a mandatory element. The project foresees that the forest compensatory measures in terms of financial funding should not be allocated to forest improvement alone, but also used to create an ecological corridor, enhancing other environmental components – focusing on fauna biodiversity in particular – that will be lost as a result of the expansion of the construction site.

On these basis, the team identified an innovative solution: an ecological corridor with new woodland clearings suitable for the habitat of the butterfly, which would allow the connection of the sub-populations. This type of intervention not only allows the team to compensate the impact of the construction site but also improve the quality of the biodiversity in the area, promoting the long-term survival of the species.

The results of the multidisciplinary study have exceeded the level of compliance with the CIPE Requirement and, as regards to the interventions under TELT's responsibility in the last two years, led to the preparation of the first experimental protocol. In addition to complying with the Requirement, this protocol also led to an improvement of the species and to eco-systemic restoration interventions.

In October 2019, even before the clearing of the woodland areas and therefore before creating any damage to be compensated, TELT put in place the interventions promoted by the work group to create new ecological corridors for the butterfly, only with the funds made available for forest compensatory measures. In line with the commitment undertaken to safeguard, protect and enhance the areas surrounding the construction site work locations, the woodland shall provide a habitat to a species that would most probably never have existed in the area without the megaproject.

Ahead of this imminent stage, TELT is also organising the future applications of the project. This phase envisages forest thinning, aimed at making the habitat suitable for the butterfly, and the realisation of new tree cavities for bats. In addition, the larger felled trees will not be removed, as the tree trunks shall remain on the ground in the wood, to constitute a biomass accumulation that allows the colonisation of species that feed on dead wood. This is a highly innovative approach for Italy, with forest compensatory measures, not only aimed at a generic improvement of the woodland, but also at recreating habitats or shelters for the fauna that will be lost during deforestation.

5. FROM THE TECHNICAL-SCIENTIFIC PROJECT TO COMMUNICATION ANGLE

The presence of the protected butterfly in the construction site area was reported in 2017 by an expert of the Lyon-Turin opposition movement and was adopted as a communication element to block the work in progress. TELT was faced with another challenge from a planning and approval point of view, while the media and public opinion highlighted the incompatibility of nature and megaprojects as an unresolvable reason against the project. For the media, the lepidopteran became "the No Tav butterfly"; biologists and militant experts conveyed the absence of a way out to the public. TELT, however, decided to address the matter as a scientific question; above all, the decision was taken to support the cause of the butterfly, despite the derogations enjoyed by the same and despite the fact that the route ahead was by no means simple and the outcome not written in stone. Upstream of these decisions there was a strategic vision of the territory that foresaw consultation with the local authorities and a dialogue with the population.

The management of communications became a key aspect towards local authorities, the population of the area, national institutions, control bodies, the EU and Global Compact, all TELT stakeholders. The public promoter, the researchers and the project itself were directly exposed in the communication and a pathway opened up that overturned the relative positions: the butterfly became part of the infrastructure project and was also communicated in all required circumstances.

The experimental protocol aimed at creating a parallel habitat for both the construction site and polyxena was officially announced at the start of the project in 2018, with a presentation by TELT and the University. The scientists involved guaranteed their independence as regards to their research and any proposed solutions, with many uncertainties.

Therefore, the activities began: biologists and researchers entered the Valley woods for the field activities; their headquarters based in the Archaeological Museum of Chiomonte, adjacent to the construction site and the habitat of the butterfly. TELT leased the property from the City Council and assigned it to the research team. This action underlines the engagement with the project.

The presence and visibility of young researchers' activities on the territory has increasingly aroused the curiosity of inhabitants about the project. TELT was anxious to receive the results of the research before putting in place media actions related to any tangible progress; on the other hand, it was necessary to satisfy a growing and timely local demand for information. Initially, the researchers themselves managed it, in an informal manner. A more in-depth analysis of the opportunities that the research offers led to an integrated approach to communication, with specific targeted objectives:

- Communicating to the community of the area the existence of the Biodiversity Project
- Enhancing the scientific presence on site
- Promoting the vision of TELT.

6. COMMUNICATION ACTIONS

- Laboratory set-up and naming
- Bioblitz and other presentation events
- Information snippets
- Media/digital relations

7. THE BIODIVERSITY LAB

The Laboratory has its own identity as a research centre: this is the specificity that TELT chose to enhance with its own name and equip the rooms, intending to:

- set up regular events focused on naturalistic and scientific animation and education, to involve local populations

- to make visitors aware of such ongoing research (institutions, students, citizens, media), a corollary of the presence of TELT in the area.

From the reception area to the research rooms, panels, monitors and other communication instruments (keywords, talking mats, walls made of building blocks, sound effects recorded in the forest, simulations of field activities, installations) immerse visitors in the laboratory work.

8. THE BIOBLITZ

The decision was made in July 2019 to organise the very first event open to the public, with the collaboration of the research group and with precise objectives endorsed by the public promoter:

• To offer 50 citizens the opportunity to "become researchers for a day" and to see the same area through different eyes, often only related to the presence of the construction site

• To officially bring the public closer to the researchers and their manner of working

• Present a totally different dimension of the work carried out by TELT.

The event focused on dissemination for scientific purposes, allowing adults and children to come into contact with the various species studied in the Susa Valley and to take part in the field activities of researchers, learning about butterflies, plants, wood-eating insects and bats.

The event marked a turning point in the history of the construction site and the public promoter: it was the first time an event involving the local citizens had been organised. Never before had the doors been opened to the local population, in a context at risk as regards to public order. In the end, 50 people (foreseen target) chose to participate spontaneously, thanks to communication actions carried out by researchers and local media, as well as in the local council chambers. The success of the event was also made possible thanks to major preparation activities and interaction with the mayors and local associations, with the analysis, prevention and management of the main criticalities, the fundamental collaboration with law enforcement units, extensive integration with the research group and a huge commitment by TELT.

The focus on the contents of the research work and the work group, the leading roles played and the driving force (public) of the project: this allowed to achieve an overall level of awareness and cross-party participation.

TELT's involvement was pretty low profile and took a back seat so as to highlight the tangible results of the scientific research and avoid media boomerang effects.

9. CONCLUSION

The lesson learnt by this experience:

- It is the first time in Europe that this kind of multidisciplinary cooperation has been put into practice

- it is the first time that these measures have been possible without additional funds than those already allocated for forest compensatory measures

- it is the first time that a multidisciplinary scientific experiment on the flora and fauna of an ecosystem has been included in the legislative process of a line infrastructure

- it is the first time that TELT has had the opportunity to communicate its approach to territorial planning and to present its constructive vision in the face of a "blocking" non-constructive vision.

More generally, it is highlighted how the design of new infrastructures makes it possible to improve the effects of mobility on the environment, and that the introduction of public works of this kind will always generate impacts on ecosystems. This experience underlines what can happen by completely reversing the vision and transforming infrastructure into opportunities, boosting the advantages for the population and the environment based on a single circular vision that ventures beyond those of the regulatory standards.

The joint design plan, with a proactive approach to the challenge of the environmental compatibility of the works, also gives a different view of their presence to areas surrounding the construction sites. Without the Turin-Lyon construction works, the protection of the rare butterfly and the whole biodiversity system would not have been feasible at such a level.

This approach, however, requires a mix of expertise, including that of ecologists who shall be involved from the initial design and planning phase of the works. Their input will be vital in assessing the environmental problems that the works may generate and in the dialogue with engineers and geologists to find effective solutions.

Starting from the scientific approach, the project acceptance strategy on the entire infrastructure also reaps its benefits. In the specific case of communication, the Biodiversity Project and Biodiversity Lab represent an opportunity for dialogue and information, but above all to disseminate the extent of the complexity of the infrastructure design planning aspects upstream and during the entire works pathway. This raises another issue: the need to "translate" scientific technical issues for the public opinion. In this sense, it is easy for those who challenge the works to pose such matters; it is much more difficult however for the public promoter to collect and present all the elements of downstream research.

The role of infrastructure changes: from pressure to opportunity, from client to collaborator of the scientific group that will bring to the table a tangible solution to combine all the requirements in terms of the necessary evolution in landscape design, due to the intervention of man but also the intervention of nature itself.