An integrated approach for the territorial impact assessment of high-speed railways

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13th September 2023
Territorial Development in the EU toward cohesion and sustainability

1. European Spatial Development Plan

2. Lisbon Strategy

3. Green Paper on Territorial Cohesion

4. Europe 2020 Strategy

5. EU Taxonomy

“The concept of territorial cohesion builds bridges between economic effectiveness, social cohesion and ecological balance, putting sustainable development at the heart of policy design”

Green paper on territorial cohesion

Mario Tartaglia, Franco Stivali, Chiara Ravagnan, Arianna Fittipaldi | An integrated approach for the territorial impact assessment of high-speed railways
Railways in EU

In line with global and European strategies, works toward:

- **THE ENHANCEMENT OF SUSTAINABLE TRANSPORT AND THE IMPROVEMENT OF ITS EFFICIENCY**
- **THE INTEGRATION WITH URBAN NETWORKS AND THE INCREASE OF TERRITORIAL QUALITY**
- **THE REDUCTION OF ENVIRONMENTAL IMPACTS AND THE IMPROVEMENT OF TERRITORIAL RESILIENCE**
- **THE REDUCTION OF SOCIAL INEQUALITIES AND MAXIMIZATION OF SOCIAL BENEFITS WITH INCLUSIVE TRANSPORT**
- **THE ENHANCEMENT OF LANDSCAPE AND THE RESILIENCE OF COMMUNITIES**

13th September 2023
the assessment of the socio-economic impacts of the infrastructures, with specific reference to
- the promotion of social inclusion,
- the reduction of inequalities and territorial differences
- Improving the quality of life of citizens

the assessment of any significant contributions to at least one or more of the following environmental objectives, as defined in the context of the same regulations, taking into account the life cycle of the work to
- climate change mitigation;
- adaptation to climate change;
- sustainable use and protection of water and marine resources;
- transition to a circular economy
- prevention and reduction of pollution;
- protection and restoration of biodiversity and ecosystems;
STATE OF THE ART: Territorial impact assessment is interpreted as an ex-ante mechanism that can be used to identify such impacts at national, regional and local levels in Member States to help identify potential policy conflicts or inconsistencies. It can also identify the differential nature of potential impacts between different places and in this sense it can provide a means of considering the spatial dimension of EU policy impacts (Fisher, 2013).

GOAL: synthesis of theoretical and methodological references to assess the territorial impacts of high-speed railways projects.

Strategic evaluation capable to integrate the various dimensions of impact

The concept is cross-sectoral and includes socio-economic, environmental and cultural indicators for the involved territories.
Methodology and phases/Index of the paper

1. Study of TIA methodologies and definition of indicators

2. Selection of the indicators in consistency with the Sustainability Infrastructures Protocols

3. Preliminary proposal of references for High speed rail TIA
1. Territorial Impact Assessment Methods and indicators

**ESPON TEQUILA (Territorial Efficiency, QUality, Identity Layered Assessment model):** introduction of an approach for impact assessment based on the 3 territorial dimensions (economic, environmental, social) related to territorial efficiency, quality and identity

**PRIN STeMA:** evaluation of the impacts in relation to the pillars of the 2020 European strategy: smart growth, inclusive growth, sustainable growth and resources and funds

**ENVISION:**
The framework provides a flexible system of criteria and performance objectives to aid decision makers and help project teams identify sustainable, resilient, and equitable approaches during the planning, design, and construction that will continue throughout the project’s operations, maintenance, and end-of-life phases. Envision bolsters environmental protections and conserves resources, promotes social wellbeing / equity, and helps communities thrive economically.
1. Territorial Impact Assessment Methods and indicators

<table>
<thead>
<tr>
<th>ECONOMIC</th>
<th>SOCIAL - CULTURAL</th>
<th>ENVIRONMENTAL</th>
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<tr>
<td><strong>TEQUILA</strong></td>
<td>&lt;&lt; Territorial Efficiency</td>
<td>Territorial Identity</td>
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<td>Accessibility</td>
<td>Cooperation</td>
<td>Reduction of inequalities</td>
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<td><strong>STEMA</strong></td>
<td>Sustainable growth</td>
<td>Inclusive growth</td>
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<td>multimodal accessibility</td>
<td>Rate of cooperation</td>
<td>Unequal distribution of regional income</td>
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**The components of territorial cohesion**

*Source: Camagni, 2006*
2. Infrastructure Protocols: Envision credits

- Energy
  - Distribution
  - Hydroelectric
  - Coal
  - Natural Gas
  - Wind
  - Solar
  - Biomass

- Water
  - Treatment
  - Distribution
  - Capture / Storage
  - Stormwater
  - Flood Control
  - Nutrient Management

- Waste
  - Solid waste
  - Recycling
  - Hazardous Waste
  - Collection & Transfer

- Transportation
  - Airports
  - Roads / Highways
  - Bikes / Pedestrians
  - Railways
  - Transit
  - Ports
  - Waterways

- Landscape
  - Public Realm
  - Parks
  - Ecosystem Services
  - Natural Infrastructure
  - Environmental Remediation

- Information
  - Telecom
  - Cables
  - Internet
  - Phones
  - Data Centers
  - Sensors
3. Preliminary proposal of references for the HSR TIA

The TIA must be, on the one hand, consistent with a solid definition of territorial cohesion - and therefore solid from a theoretical point of view - and, on the other hand, sufficiently operational and easy to use (Camagni).
### 3. Preliminary proposal of references for the HSR TIA

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<td>REDUCTION OF TERRITORIAL IMBALANCES</td>
<td>SUSTAINABLE GROWTH</td>
<td>Territorial Efficiency</td>
<td>Railway infrastructure safety (reduction of interference)</td>
<td>OP1</td>
<td>QUALITY OF LIFE</td>
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<td>External accessibility (to national and international infrastructure nodes)</td>
<td>OP3</td>
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<td>Infrastructural equipment</td>
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<td>Regional internal connectivity</td>
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<td>Safety of people (reduction of accidents)</td>
<td>OP1</td>
<td>LEADERSHIP</td>
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<td>Expense for work purposes</td>
<td>OP1</td>
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<td>Expense for tourism purposes</td>
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<td>INCLUSIVE GROWTH</td>
<td>Territorial Identity</td>
<td>Accessibility and enhancement of historical-cultural and naturalistic heritage</td>
<td>OP3</td>
<td>QUALITY OF LIFE</td>
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<td>Development of sustainable and resilient territorial visions in compliance with local planning frameworks</td>
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<td>Territorial leadership and stakeholder engagement</td>
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<td>PROMOTION OF SOCIAL INCLUSION AND IMPROVEMENT OF THE QUALITY OF LIFE</td>
<td>Territorial Quality</td>
<td>Increase in spaces for collective use</td>
<td>OP4</td>
<td>QUALITY OF LIFE</td>
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<td>Accessibility to urban and metropolitan services</td>
<td>OP4</td>
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<td>Mitigation of the effects on climate change</td>
<td>OP2</td>
<td>CLIMATE AND RESILIENCE</td>
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<td>Air quality</td>
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<td>Use of renewable energies</td>
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<td>RESOURCES ALLOCATIONS</td>
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<td>Saving and reusing resources</td>
<td>OP2</td>
<td>NATURAL WORLD</td>
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Bibliographical references


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EEA (2011), Green infrastructure and territorial cohesion. The concept of green infrastructure and its integration into policies using monitoring systems.


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